

The quality of society: essays on measurement and trust

E. J. Sibley

A thesis submitted for the degree of PhD Applied Social and Economic Research

Institute for Social and Economic Research

University of Essex

September 2015

Copyright © Elissa J. Sibley 2015 All rights
reserved

Please do not cite without permission.

CONTENTS

Acknowledgements	10
Summary	11
1.0 Subjective indicators of the progress of society	
1.1 Introduction	13
1.1.1 Social cohesion	15
1.1.2 Measuring the quality of society	17
1.1.3 The use of subjective indicators	21
1.1.4 The correlates of positive and negative subjective evaluations	25
1.1.5 Concluding comments	28
1.2 Thesis overview	29
2.0 The perceived progress of society: measurement invariance across time	
2.1 Introduction	34
2.1.1 Subjective indicators of the progress of society	36
2.1.2 (Generalised) social trust	38
2.1.2.1 Measuring social trust	41
2.1.2.2 Methodological behaviour: theoretical orientations	41
2.1.2.3 Methodological behaviour: empirical evidence	43
2.1.2.4 Summary	45
2.1.3 Trust in Institutions	45
2.1.3.1 Measuring trust in institutions	49
2.1.3.2 Methodological behaviour: theoretical orientations	50
2.1.3.3 Methodological behaviour: empirical findings	53
2.1.3.4 Summary	54
2.1.4 Macro-performance: evaluations of national performance	54
2.1.4.1 The measurement of evaluation of national performance	56
2.1.4.2 Methodological behaviour: theoretical orientation	56
2.1.4.3 Methodological behaviour: empirical evidence	58
2.1.4.4 Summary	59
2.1.5 Micro-performance: perceived quality of public services	59
2.1.5.1 Measurement of perceived quality of public services	61
2.1.5.2 Methodological behaviour: theoretical expectations	62
2.1.5.3 Methodological behaviour: empirical findings	62
2.1.5.4 Summary	63
2.1.6 Hypotheses and research questions	63
2.2 Data and Methods	64
2.2.1 Data	64
2.2.2 Methods I	67
2.2.3 Methods II	73
2.3 Results and discussion	77

2.3.1 Data	77
2.3.2 Sample	77
2.3.3 Item distributions and discussion of trends	79
2.3.4 Analyses: Phase I	82
2.3.5 Analyses: Phase II	89
2.4 Conclusions	102
3.0 Literature review: inter-individual variation in generalised trust	
3.1 Introduction	103
3.1.1 Generalised trust and social capital	105
3.1.2 Self-reported generalised trust	107
3.1.2.1 Measuring self-reported trust	107
3.1.2.2 Self-reported trust: associations with other variables	112
3.1.3 Behavioural trust (and trustworthiness)	113
3.1.3.1 Measuring behavioural trust (and trustworthiness)	113
3.1.3.2 Behavioural trust and trustworthiness: prevalence in experimental studies	115
3.1.3.3 Self-reported trust and behaviour in the trust game	116
3.2 Theoretical accounts of the origins of generalised trust	118
3.2.1 Individual-level theories: the relevance of personality and values	120
3.2.2 Personality Theory	122
3.2.2.1 Conceptualising and measuring personality	123
3.2.2.2 Testing Personality Theory: predicting self-reported generalised trust	129
3.2.2.3 Testing Personality Theory: predicting behavioural trust and trustworthiness	131
3.2.2.4 Testing Personality Theory: why is further investigation needed?	133
3.2.2.5 Suggestions for future research	138
3.2.3 Moral foundations of trust theory	139
3.2.3.1 Measuring values	141
3.2.3.2 Testing MFTT: predicting self-reported generalised trust	147
3.2.3.3 Testing MFTT: predicting behavioural trust and trustworthiness	149
3.2.3.4 Testing MFTT: why is further investigation needed?	151
3.2.3.5 Summary	152
3.2.4 Characteristics of society: Societal (or Institutional) Theory	153
3.2.4.1 Measuring and testing the characteristics of society: Predicting self-reported trust	159
3.2.4.2 Testing Societal Theory: predicting behavioural trust and trustworthiness	163
3.2.4.3 Summary	163
3.3 Conclusions	164
4.0 The moral foundations of generalised trust?	
4.1 Introduction	166

4.1.1 Generalised trust at the individual-level	168
4.1.1.1 Generalised trust as moralistic trust	168
4.1.1.2 Generalised trust and human values	170
4.1.1.3 Empirical findings regarding the moral foundations of trust	176
4.1.1.4 Summary and hypotheses: individual-level drivers of generalised trust	177
4.1.2 The impact of the characteristics of society	179
4.1.2.1 The characteristics of society and generalised trust	179
4.1.2.2 Human values and the characteristics of society	181
4.1.2.3 Characteristics of society, values and generalised trust	183
4.1.2.4 Summary and hypotheses	186
4.1.3 Developments to existing research	187
4.2 Data and Methods	189
4.2.1 Dependent and predictor variables	190
4.2.1.1 Dependent variable: generalised trust	190
4.2.1.2 Individual-level predictor variables: Schwartz's human values	190
4.2.1.3 Society-level predictor variables	193
4.2.2 Methods and analyses	195
4.2.2.1 Preparing the human values variables	195
4.2.2.2 Individual-level 'control' variables	196
4.2.3 Analyses	197
4.2.3.1 Generating the multilevel models	198
4.3 Results and Discussion	203
4.3.1 Descriptive analyses	204
4.3.1.1 The sample	204
4.3.1.2 Dependent variable	207
4.3.1.3 Human values	208
4.3.1.4 Human values and generalised trust	210
4.3.2 Correlations	213
4.3.3 The null model and calculating the intraclass correlation coefficient	214
4.3.4 Random intercepts models	215
4.3.5 Cross-national stability of the relationships between values and generalised trust	219
4.3.5.1 Random slopes models	223
4.4 Conclusions	226
5.0 Testing Personality Theory: identifying the individual-level drivers of self-reported trust, behavioural trust and trustworthiness	
5.1 Introduction	229
5.1.1 Personality and its measurement	232
5.1.2 Personality – its drivers and influence	236
5.1.2.1 Neurological correlates with personality: the evidence	238
5.1.2.2 In theory: the drivers of personality	240
5.1.2.3 Approach and avoidance temperaments	241

5.1.2.4 The RPS, and Neuroticism and Extraversion	244
5.1.3 Personality and trust-related outcomes	245
5.1.3.1 Personality and generalised trust: theoretical associations	245
5.1.3.2 Personality drivers of trust and trustworthiness in the literature	251
5.1.3.2.1 Empirical evidence: Personality and self-reported trust	251
5.1.3.2.2 Personality and behavioural trust	254
5.1.3.2.3 Personality and behavioural trustworthiness	256
5.1.3.2.4 Summary: trust-related outcome measures and personality	258
5.1.4 Hypotheses and research questions	259
5.1.4.1 Personality and self-reported trust	259
5.1.4.2 Personality and behavioural trust	260
5.1.4.3 Personality and trustworthiness	260
5.1.5 A note on the possible influence of context	261
5.2 Experimental design	261
5.2.1 Part 1: The questionnaire	265
5.2.1.1 Questionnaire content	265
5.2.1.2 Questionnaire design	266
5.2.1.3 Administration and participant reward	268
5.2.2 Part 2: The trust game	269
5.2.2.1 Design of the game	269
5.2.2.2 Administration and participant reward	271
5.2.2.3 Additional measures	273
5.3 Data and methods	274
5.3.1 Data	274
5.3.2 Analytical methods	278
5.3.2.1 Confounding variables	278
5.3.2.2 Moderator variables	280
5.3.2.3 Correlations and t-tests	282
5.3.2.4 Regression models	283
5.4 Results and Discussion	284
5.4.1 Descriptive analyses	284
5.4.1.1 Sample	284
5.4.1.2 Demographic variables	285
5.4.1.3 Outcome measures	288
5.4.1.4 Personality	291
5.4.1.5 Additional variables	297
5.4.1.6 Confounding factors	299
5.4.2 Preliminary analyses	302
5.4.2.1 Preliminary models: moderating variables	302
5.4.2.2 Reflections	308
5.4.2.3 Correlations between personality traits and facets	310
5.4.2.4 Correlations between self-reported trust, behavioural trust and trustworthiness	311

5.4.2.5 Positive and negative reciprocity	311
5.4.3 Regression models	312
5.4.3.1 Predicting self-reported generalised trust	315
5.4.3.2 Predicting behavioural trust	322
5.4.3.3 Predicting behavioural trustworthiness	328
5.4.4 The drivers of self-reported trust, behavioural trust and trustworthiness	332
5.4.4.1 Self-reported and behavioural trust	333
5.4.4.2 Self-reported trust and trustworthiness	335
5.5 Conclusions	336
5.5.1 Lessons, limitations and recommendations for future research	338
5.5.2 Overall conclusions	345
6.0 Conclusions	
6.1 Introduction	347
6.2 An overview of Chapters 2 to 5	348
6.3 Who trusts and why?	351
6.4 Implications of my findings for research into generalised trust, and the importance of individual-level characteristics	353
6.5 Overall conclusions	357
Appendices	359
References	398

TABLES

1.1 Forrest & Kearns' (2001) domains of social cohesion	17
1.2 Harrison et al.'s (2011) domains of the progress of society	19
2.1 Items used in models	66
2.2 Sample versus population statistics	78
2.3 CFA results	91
2.4 Results of MGCFA	95
3.1 Trait models of personality	126
3.2 Relevant values models	143
4.1 Schwartz's (2001) HVS constructs and measures	192
4.2 Level 2 variables	193
4.3 Results of random intercepts models	216
4.4 Results of random slopes models	225
5.1 McCrae and Costa's (1999) Big Five	235
5.2 Facets within the NEO personality inventory	247
5.3 Mean scores on the NEO traits and facets	292
5.4 Control variables and experimental measures	304
5.5 Regression models – traits and moderator variables	314
5.6 Regression table for self-reported trust	319
5.7 Regression table for behavioural trust and trustworthiness	323
5.8 Regression table showing all significant predictors	332

FIGURES

2.1 Individual factors (ESS2)	69
2.2 Measurement model – MGCFA – Model B1	72
2.3a – d Plots illustrating the trajectories of the thirteen items	80
2.4 Results of Step 1 – individual factors (ESS2 data)	85
2.5 Measurement model for ESS2	88
2.6 Final measurement model for ESS2 – 5	100
3.1 Schwartz’s quasi-circular model of human values	146
4.1 Financial comfort cross-nationally	206
4.2a – d Generalised trust by level 2 variables	208
4.3 Prioritisation of Schwartz’s human values cross-nationally	210
4.4a Generalised trust score by Self-transcendence (cross-nationally)	211
4.4b Generalised trust score by (Need for) Security (cross-nationally)	212
4.4c Generalised trust score by Conformity/Tradition (cross-nationally)	212
4.5a Predicted relationship between trust and Self-transcendence	222
4.5b Predicted relationship between trust and Security	222
4.5c Predicted relationship between trust and Conformity/ Tradition	222
5.1 Costa and McCrae’s (1999) five-factor personality system	237
5.2 Smillie’s (2008) model of Reinforcement Sensitivity Theory	244

Acknowledgements

My gratitude goes to my supervisor, David Voas, for his support and insight in addition to his seemingly endless patience and good humour. I would also like to thank my second supervisor, Nick Allum, and my supervisors during my first year, Amanda Sacker and Annette Jäckle. My thanks also go to the ESRC for funding my PhD and to ESSEXLab for contributing substantially to funding my experiment.

I would like to thank my PhD colleagues for the many conversations, the humour, the distractions and the low lighting – I am very happy to have shared these years with you. I also owe thanks to some amazing ISER researchers, in particular Paul Clarke and Maria Iacovou, and to the ISER Admin team.

Finally, my thanks of course go to my brilliant family, who have been extremely supportive, and to my non-PhD friends for their understanding when I became a PhD-hermit!

Summary

The progress of society is determined in part by its institutions (e.g. their levels of efficacy and corruption) and in part by dynamics within the population (e.g. the levels of tension between social groups). The quantitative measurement of relevant variables offers valuable insight into the extent and direction of social change. The key questions I address in this thesis are whether a subset of subjective indicators of the progress of society can be meaningfully used in time-series analysis (Chapter 2) and whether individual-level characteristics are predictive of self-reported generalised trust (Chapters 4 and 5).

In the first substantive chapter (Chapter 2) I find that the sensitivity of subjective evaluations to real world events can destabilise the relationships between variables, resulting in a lack of invariance across time. This highlights the importance of testing for measurement invariance before using such constructs in substantive analyses and discourages time-series analysis using Harrison et al.'s (2011) *evaluation of national performance* domain. In the second and third substantive chapters (Chapters 4 and 5) I find support, respectively, for Uslaner's (2002) theory of the moral foundations of generalised trust and for Personality Theory (Delhey & Newton, 2003).

Much emphasis has been placed on generalised trust as an indicator of social cohesion, and its apparent decline in recent decades has been cited by many as a cause for concern. My findings in Chapters 4 and 5 suggest that those who are

lowest in generalised trust are likely to score highly on depression and feelings of vulnerability. Future work should consider possible ways to increase social cohesion while addressing the likely concerns of those with low levels of generalised trust.

Chapter 5 also compares the personality-based predictors of self-reported trust with those of behaviour as the Sender and Returner in the trust game. My findings do not support the use of the trust game as a behavioural measure of generalised trust.

Chapter 1

Introductory Chapter: Subjective indicators of the progress of society

1.1 Introduction

The progress of society is often evaluated via objective indicators such as Gross Domestic Product (GDP), the Human Development Index (HDI) and other statistics as offered by sources such as Eurostat and the World Bank. These objective measures are subjected to analyses that inform the development and evaluation of policy as well as for academic purposes. They are also used to draw inferences about the quality of life of those living within that society (e.g. the Gini indicator of income inequality). However, to properly measure the impact of policy, social or system changes upon those living within the society, it would be appropriate to use subjective data (Harrison, Jowell, & Sibley, 2011; Stiglitz, Sen, & Fitoussi, 2009).

Subjective indicators have for some time been deployed in social surveys to measure social cohesion – a concept that taps, essentially, the extent to which the members of society function together as a harmonious unit. Measures of social cohesion seek evaluations of the state of society on a range of key domains. While there is considerable overlap with measures of social cohesion, measures of the progress of society seek in addition to capture the degree of disturbance caused by suboptimal conditions.

With a reported drop in social cohesion in recent decades (Kearns & Forrest, 2000; Putnam, 2000), interest has risen in identifying ways to improve levels of cohesion and, in doing so, raise levels of wellbeing within the population (Farrell et al., 2008; Kearns & Forrest, 2000). Measuring across time the constructs that are relevant to the perceived progress of society offers a valuable tool for evaluating the extent and direction of social change, and its consequences for the wellbeing of the population. Aside from being of interest in themselves, such indicators can be informative regarding the effectiveness of interventions and initiatives designed to improve the conditions in which people live.

This chapter reviews the available theoretical literature on the measurement of subjective evaluations of the progress of society (due to the newness of this field, no empirical studies have yet emerged). Using social cohesion as a starting point, I introduce Harrison et al.'s (2011) proposed set of indicators of the progress of society before discussing the utility of subjective indicators, the causes of variation between and within societies, and the potential impact of subjective evaluations upon not just the individual's own life but also their social environment and the broader society. I then identify the work that is still to be done in this important, emerging area of research and the first step to be taken in this thesis in support of its development. In the remainder of this review, I describe the indicators that will be used in the first substantive chapter and their relevance to the quality of society¹. I then give an overview of the other chapters in this thesis.

¹ In this chapter, the term *quality of society* will be used interchangeably with the terms *progress of society*, *wellbeing of society* and *societal wellbeing*.

1.1.1 Social cohesion

“The constituent dimensions of social cohesion here are: common values and a civic culture; social order and social control; social solidarity and reductions in wealth disparities; social networks and social capital; and territorial belonging and identity.”

(Kearns & Forrest, 2000: 996)

Social cohesion is regarded as a positive thing – cohesion implying that individuals, groups and communities function as one society and contribute positively to the achievement of shared goals. The more idealised perspective on the antecedents of social cohesion include shared moral values and behavioural norms, and the demonstration (amongst members of the public) of an active interest in civic and political life. An alternative, less romanticised, view is that social cohesion results from the placid acceptance of one’s ‘lot’ in life – “a by-product of the routines, demands and reciprocities involved in everyday life... social cohesion is about getting by and getting on at the more mundane level of everyday life” (Kearns & Forrest, 2000: 998).

“... a society lacking cohesion would be one which displayed social disorder and conflict, disparate moral values, extreme social inequality, low levels of social interaction between and within communities and low levels of place attachment.”

(Forrest & Kearns, 2001: 2128)

A low level of social cohesion is likely to result in a society marked by conflict, corruption and distrust not only amongst the public but between the public and their local and national institutions. It is widely theorised that these conditions are associated with lower levels of personal and social wellbeing (Farrell et al., 2008).

With a reported reduction in social cohesion in recent decades (Kearns & Forrest, 2000; Putnam, 2000), interest has risen in identifying ways to improve levels of cohesion. It is expected that doing so would both raise levels of wellbeing within the population and improve the state of society, as higher levels of social support allow government resources to be redirected to fund other services (Kearns & Forrest, 2000; Farrell et al., 2008).

Forrest and Kearns (2001) outline the domains on which social cohesion should be measured (see Table 1.1). Items measuring the domains of social cohesion ask the respondent to report, for example, their own level of tolerance (under social order and social control) and these scores are averaged across respondents to generate country means. Clearly, this tells us the mean level of self-reported tolerance. Building on the social cohesion literature, Harrison et al. (2011) propose a set of items that measures the perceived quality of society. Whereas the classical social cohesion measures inform us, for example, of the average level of self-reported tolerance, Harrison et al.'s equivalent measure asks respondents to evaluate the degree of tolerance within society.

Table 1.1: Forrest and Kearns' (2001) domains of social cohesion

Domain	Description
Common values and civic culture	Common aims and objectives; common moral principles and codes of behaviour; support for political institutions and participation in politics
Social order and social control	Absence of general conflict and threats to the existing order; absence of incivility; effective informal social control; tolerance; respect for difference; intergroup co-operation
Social solidarity and reductions in wealth disparities	Harmonious economic and social development and common standards; redistribution of public finances and of opportunities; equal access to services and welfare benefits; ready acknowledgement of social obligations and willingness to assist others
Social networks and social capital	High degree of social interaction within communities and families; civic engagement and associational activity; easy resolution of collective action problems
Place attachment and identity	Strong attachment to place; intertwining of personal and place identity

(Source: Table 1, Forrest & Kearns, 2001: 2129. Reproduced with permission from SAGE Publications.)

Below, I give a brief overview of Harrison and colleagues' (2011) set of indicators and the theoretical basis for its development.

1.1.2 Measuring the quality of society

In their report on The Measurement of Economic Performance and Social Progress, Stiglitz et al. (2009) highlighted the multidimensional nature of societal wellbeing.

However, they stopped short of proposing a set of indicators that should be measured.

In partial response to this, Harrison et al. (2011) compiled a set of indicators to measure individuals' perceptions of the progress of the society in which they live. This work began in 2007 and resulted in a set of 35 items being drawn from existing social surveys to measure twelve 'domains', oriented predominantly within Lockwood's (1964) *social integration* and *system integration*:

“Whereas the problem of social integration focuses attention upon the orderly or conflictful relationships between the *actors*, the problem of system integration focuses on the orderly or conflictful relationships between the *parts*, of a social system”

(Lockwood, 1964: 245)

Harrison and colleagues (2011) describe five indicators of perceived social integration, four of perceived system integration and three that measure 'overall perceptions of society' (Harrison et al., 2011: 73). These domains and the survey sources cited by the authors are listed in Table 1.2 below.

Table 1.2: The twelve domains of the perceived quality of society

	Domain	No. of items (source)
Perceived social integration	Trust within society	3 (ESS)
	Perception of societal tolerance	3 (Gallup World Poll)
	Absence/ presence of social conflict	3 (EQLS)
	Perception of distributive justice	3 (ISSP, ESS)
	Anomie	2 (Eurobarometer)
Perceived system integration	Trust/ confidence in institutions	5 (ESS or EVS)
	Evaluation of national performance	3 (ESS)
	Provision of public services	2 (ESS)
	(Perceived) quality of public services	6 (EQLS)
Overall perceptions of society	Satisfaction with society	1 (Eurobarometer)
	Intention to emigrate/ remain	1 (Gallup World Poll)
	Situation of society relative to time and place	3 (Eurobarometer)

(Source: Adapted from Appendix A, Harrison et al., 2011: 73)

The domains put forward by Harrison et al. (2011) aim to capture the individual's evaluation of how well society is functioning at the social and system levels. At the social level these measure the degree of trust between strangers, tolerance and conflict between social groups, inequality in the system's treatment of different social groups, and political disenchantment. At the system level they target confidence in institutions (such as parliament and the police), satisfaction with the country's performance on key dimensions, and the perceived quality of services provided by the national and local authorities.

According to Lockwood (1964), *perceived social integration* offers a subjective evaluation of the level of social cohesion within society, while *perceived system*

integration taps the respondent's level of support for the authorities and political regime. Interestingly, at least at the theoretical level both social and system integration appear to fall within Forrest and Kearns' (2001) indicators of social cohesion.

As mentioned earlier, a key feature that distinguishes the measurement of the progress of society from that of social cohesion is the inclusion of items that measure subjective evaluations of the extent to which negative indicators of social cohesion are problematic. For example, Harrison et al.'s (2011) measure of *perception of distributive justice* asks whether some groups within society receive *unfair* advantages. This offers augmentation to the information available from objective measures; even where there are high levels of inequality, if citizens are accepting of these circumstances we may expect the level of inequality to have little impact on support for institutions or satisfaction with society. We can see from the third column in Table 1.2 that at the time of compilation no one survey offered measures for the complete set of indicators.

The addition of the final domain in the list, *situation of society relative to time and place*, asks the respondent to evaluate society's current position relative to its position in the past and their expectation of whether it will improve or decline in the future. Again, the individual's standpoint on this domain is likely to add important contextual information to their responses on the other indicators. In the next section I discuss the use utility of subjective indicators and any issues that need to be borne in mind when using them in social research.

1.1.3 The use of subjective indicators

Although valued by survey researchers, subjective indicators have not previously been used in the manner proposed by Harrison et al. (2011). This section examines their usefulness and their strength or vulnerability in the face of potential confounding influences. I address their overall utility (i.e. why it is desirable to use subjective indicators), theories of their origins and susceptibility to influence, and the consequences that may arise from individuals holding positive versus negative evaluations.

The utility of subjective indicators

Although they cannot achieve the same degree of standardisation as objective indicators, subjective evaluations of the quality of society can be used in a number of ways. Firstly, it is generally our beliefs, not objective reality, that determine our behaviour. For example, if I believe my neighbourhood to be unsafe I will avoid certain behaviours that I feel put me at risk of becoming a victim of violent crime. Objectively, my neighbourhood may actually be very safe and the likelihood of violent crime very low, but it is my *perception* that influences my behaviour, my stress levels and perhaps my interaction with my neighbours, and has a negative impact on my wellbeing. Additionally, in the realm of system integration, if I do not

have confidence in the political regime I am less likely to vote in the next election irrespective of the actual quality of its performance or the level of corruption within the regime.

Secondly, subjective indicators do of course provide valuable feedback regarding the valence of citizens'² feelings about the evaluation objects and the pattern of any changes over time, and permit cross-national comparisons. Such information offers a means to evaluate the impact (or lack thereof) of changes to policy and services, and other forms of social intervention. For example, a particular policy change may be designed to produce a certain outcome, however, if no change is observed in the relevant indicators then this may suggest that the intervention was not successful. Discrepancies between objective and subjective measures can also flag areas where further investigation is needed. For example, a service that is performing outstandingly according to objective measures may receive a poor evaluation in subjective indicators perhaps due to a lack of public awareness of the service or the service not being objectively evaluated on dimensions that are most important to the public (Glaser & Denhardt, 2000).

A lack of attention to subjective indicators would therefore signal missed opportunities to glean vital information about how well society – its institutions and services – is serving its population and how well the members of the population are working together. The inclusion of evaluations of the fairness of the current circumstances within society also permits investigation into the degree of concern

² Here, I use the word *citizens* to mean 'people who live in that particular society'. I do not distinguish between those who do and do not hold legal citizenship.

about particular policy topics amongst individuals and different groups within society. However, subjective indicators do have limitations – such as their vulnerability to influence by local, national or global events (e.g. Stoop, 2007).

The origins of and influences on subjective evaluations

At the individual level, the valence of subjective evaluations may vary due to several factors. Taking genuine variation within society first: individuals differ in factors such as their expectations, priorities and frequency and nature of exposure to the evaluation object as well as their level of ‘grievance asymmetry’ – their focus on negative versus positive evaluations (Yang & Holzer, 2006). Whether we are talking about a public service (such as the education system or public transport), institutions (such as the police or parliament) or even the trustworthiness of strangers, people will naturally evaluate the object from different perspectives and against different criteria. In addition, individuals living in different regions and those from different social backgrounds are likely to observe varying quality of service from any specified service or institution. Those who do not use a service or have had no dealings with that particular institution will still be willing to evaluate it on the basis of media attention and information passed on from other people (Denters, Gabriel, & Torcal, 2007; Glaser & Denhardt, 2000).

Evaluations can also be artificially manipulated by one’s underlying support or distaste for the incumbent authorities. Evaluations of political institutions, as well as

their performance and the quality of the services they provide, may all be instinctively upgraded during the term of a political party one supports or downgraded when a party one opposes is in power (Denters et al., 2007).

Variation may also arise due to differences in interpretation of the question. Sturgis and Smith (2010) report that approximately 25% of respondents, when asked to evaluate the trustworthiness of people 'in general', report having made their decision based on people they know. This increases their level of self-reported trust but not because they have more trust in strangers, rather, they have answered a different question to the one they were asked.

When comparing subjective evaluations between societies, differences may arise due to objective variation in the quality of those societies or due to cultural factors that influence individuals' response styles. Possible objective differences between societies include the types of political regime and welfare state, level of national wealth and the degree of income inequality, corruption and fractionalisation. The possible impact of cultural factors, however, relates to issues such as individuals' use of the response scale (for example, some cultures expressing stronger views than others; e.g. Chen, Lee, & Stevenson, 1995) and differing tendencies towards acquiescence bias (the tendency to agree; e.g. Smith, 2004). While one would expect to observe that higher quality societies receive more positive evaluations, these potential confounding factors may generate contrary findings.

Clearly, there are a number of potential influences on subjective evaluations and these influences may introduce a degree of unreliability into the data we obtain. However, what matters for one's feelings about the society in which they live is not the accuracy of their evaluations but rather their valence. A person who has a high level of confidence in institutions, is very satisfied with the levels of micro- and macro-performance (i.e. the performance of local and national authorities, respectively) and who believes that the society they live in is a socially harmonious place full of trustworthy people, is likely to feel positive about society. This person may be very much mistaken on all counts, but if they are oblivious to this fact then it will not affect their feelings about living in that society. The impact of an objectively good or bad society upon the wellbeing of its inhabitants will therefore vary depending upon the extent to which those inhabitants are (a) aware of the situation, and (b) accepting of it. The next section discusses the potential individual-level, social and societal correlates of positive and negative perceptions of social and system integration.

1.1.4 The correlates of positive and negative subjective evaluations

Positive and negative evaluations of the quality of society are associated with different effects at the level of the individual, as well as their social environment and the broader society. While it would not be appropriate to refer to these as either causes or consequences of their bearer's perceptions of social and system integration, as detailed below certain relationships have been observed in a number

of empirical studies. All reported effects are observed when controlling at least for the respondents' socioeconomic status (income and/ or occupation) and standard demographic characteristics (age, gender and education).

Individual-level correlates

People who perceive a high level of social integration and stability (that other people are generally trustworthy and tolerant, that there is little conflict within and between social groups, that the allocation of resources is fair) are more likely to report higher levels of physical wellbeing and happiness (e.g. Helliwell & Putnam, 2004). More positive perceptions of system integration (a higher level of trust in institutions and greater satisfaction with micro- and macro-performance) are associated with, for example, a more positive attitude towards law abidance (Marien & Hooghe, 2011).

Correlates at the social level

A higher level of civic participation is associated with a higher level of perceived social integration, and this encourages the formation of informal groups. This in turn permits the development of a positively reinforcing norm of reciprocity and broader support networks. The perception of high tolerance and little conflict is likely to facilitate intergroup cohesion and to nurture bridging social capital. The opposite

scenario – a low level of perceived social integration – is more likely to lead to the reinforcement (intentionally or otherwise) of antisocial norms and the strengthening of bonding social capital (Newton, 2001; Putnam, 2000).

A higher level of perceived system integration may be visible in the social environment as participation in local government, greater voter turnout in local elections and support for events organised by local institutions (Putnam, 2000; Uslaner, 2002). Norms of positive interaction between the public and local authorities are likely to promote good citizenry and thus a low crime rate. In this way, higher perceived social integration may become self-perpetuating as both cause and effect.

Society-level correlates

A higher aggregate level of perceived social integration is likely to imply that the population are accepting and supportive of institutions that promote equal opportunities, progressive social and welfare policies and positive attitudes towards diversity (Boix & Posner, 1998; Uslaner, 2002). Positive perceptions of factors relating to system integration are likely to be associated with political engagement, higher voter turnout, and a progressive population electing public officials who share their values (Boix & Posner, 1998; Knack, 2002). Alternatively, a low average level of perceived social integration is likely to indicate social discord. Where the population has a choice, this may prompt votes for officials who promise to change

the status quo or, in the case of severe disaffection with the system, action that bypasses the official channels (Hooghe, Marien, & Pauwels, 2011).

1.1.5 Concluding comments

We have seen that the individual's subjective evaluations of social and system integration offer insight into the impact of policy decisions on the population and are associated with behaviours that have potentially far-reaching consequences.

As described above, Harrison et al. (2011) put forward a dashboard of indicators taken from a variety of cross-national surveys. These indicators are intended for use in the measurement of subjective evaluations of the progress of society. Some of these indicators comprise sets of items that are theoretically connected and have previously demonstrated the expected associations. Others, however, are at present more speculative. For example, the three item social trust scale is known to be conceptually and empirically sound (e.g. Allum, Patulny, Read, & Sturgis, 2010; Allum et al., 2011), while the items comprising the indicators of micro- and macro-performance have been less widely examined. Before we can have confidence that these constructs can be reliably measured and meaningfully interpreted, it is necessary to assess their measurement invariance over time and cross-nationally.

In the section that follows I give an overview of the remaining chapters, with Chapter 2 embodying my first step in support of progressing the use of these

indicators. However, while researching the background literature for Chapter 2, I became aware of some compelling gaps in the literature on generalised social trust. For the second and third substantive chapters, I therefore narrowed my focus to research questions relating to the aetiology of generalised social trust. In total, there are five further chapters in this thesis: the first substantive chapter, a review of the literature on the measurement and origins of generalised social trust, the second and third substantive chapters and finally the concluding chapter. Below I give an overview of each of these in turn.

1.2 Thesis overview

Chapter 2

The perceived quality of society: measurement invariance over time

The task for the first substantive chapter of this thesis was to establish the degree of measurement invariance over time of the indicators proposed by Harrison et al. (2011). However, given that no one survey instrument offered items representing all twelve domains, I restricted the number of domains to those that were present in one survey. Of those listed in Table 1.2 above, the European Social Survey (ESS) offered measures for more domains than any other. These domains were: social trust (within *perceived social integration*), and trust in institutions, evaluation of national performance and the perceived quality of public services (within *perceived system integration*).

These four domains are measured by thirteen items from the core questionnaire of the European Social Survey (Rounds 2 – 5, spanning the years 2002 – 2010). In subjecting these items to multiple-group confirmatory factor analysis (MGCFA), I found that the theorised five-factor measurement model did not demonstrate scalar invariance over time. This was due to the *evaluation of national performance* factor, which comprised three items: satisfaction with the economy, democracy and government performance. The financial crisis, which began in 2006, resulted in a substantial deterioration in individuals' satisfaction with the economy but left their satisfaction with democracy and the government relatively intact. This dismantled the *evaluation of national performance* factor. A six-factor model, with 'satisfaction with the economy' removed to stand alone, did achieve scalar invariance.

Chapter 3

Literature review: inter-individual variation in generalised trust

This chapter reviews the literature on the measurement and aetiology of generalised trust. With the popular focus on the social origins of generalised trust (e.g. Putnam, 2000), I look primarily at theories that operate at the levels of the individual and society. I conclude that there is as yet a dearth of material testing the individual-level theories – the theory of the moral foundations of trust (MFFT; Uslaner, 2002)

and Personality Theory (Delhey & Newton, 2003). I conclude by highlighting areas that would benefit from further research.

Chapter 4

The moral foundations of generalised trust?

In my second substantive chapter, I use multilevel modelling to test Uslaner's (2002) theory of the moral foundations of generalised trust (MFTT). I test whether values predict trust and whether the relationships between values and trust are consistent across different societal contexts. Taking individual-level data from the European Social Survey, my outcome measure is the generalised trust question (GTQ) and my main predictor variables are theoretically relevant constructs from Schwartz's (2001) Human Values Scale. The second level in the model, the society-level, is populated using national statistics taken from sources such as the World Bank.

This study finds statistically significant relationships between certain values constructs and generalised trust. Random slopes analysis revealed that the coefficients for these constructs are generally consistent cross-nationally, barring a borderline significant effect for Conformity/ Tradition in some models.

Chapter 5

Testing Personality Theory: identifying the individual-level drivers of self-reported trust, behavioural trust and trustworthiness

In this final substantive chapter I report the design, implementation and results of an experiment that tested whether the individual's personality shows associations with their level of generalised trust and their behaviour in the trust game. Participants in this two-part experiment first completed a questionnaire and, a week later, played two rounds of the trust game. My primary outcome measures were the generalised trust question (measured in the questionnaire), and behavioural trust and trustworthiness (inferred from their behaviour in the trust game). To measure personality I used the 240-item NEO-PI-3.

I found that while aspects of one's personality significantly predict all three outcome measures, there is little correspondence between the drivers of self-reported trust and behavioural trust. At the trait level Agreeableness is positively associated with both self-reported trust and behavioural trustworthiness, while *trust* and *altruism* are the only predictors they have in common at the facet level (trustworthiness being associated with two further facets within Agreeableness).

This indicates support for the Personality Theory of generalised trust, but does generate some uncertainty regarding the appropriateness of using the trust game as a behavioural measure of generalised trust: as discussed in Chapter 5, future research should investigate alternative game designs.

Chapter 6

Conclusions

In my concluding chapter I review the findings of my three substantive chapters and the contributions they make to the literature. In doing so, I discuss the possible implications of my results for future research into generalised trust, and the relevance of individual-level characteristics (such as personality) to social research.

CHAPTER 2

The perceived progress of society: measurement invariance across time

2.1 Introduction

The progress³ of society is commonly measured using objective indicators such as Gross Domestic Product (GDP), the Human Development Index (HDI), the proportion of the population that has attained a certain level of education, the Gini coefficient of income inequality and the level of institutional corruption. A more progressive society would tend to score more highly on GDP, the HDI and education and lower on corruption and income inequality (e.g. LSE, 2008) .

Recorded as national statistics, such data offer standardised measures that should be comparable across time and between countries. However, objective measures do not tell us what it is like to live in a society and there is a growing movement towards the use of subjective indicators, such as those gathered in social surveys (Harrison et al., 2011; Stiglitz et al., 2009). Using subjective indicators, the progress (or wellbeing) of society has been conceptualised both as the aggregate of individuals' self-reported happiness or life satisfaction (e.g. Allin, 2007), and as individuals' evaluations of the qualities of the society itself (Harrison et al., 2011; see also Sirgy, 2011). Beyond the simple garnering of information relating to public opinion, such data offers important feedback to the authorities regarding how well

³ For the purposes of this chapter, I use the term 'progress of society' interchangeably with 'quality of society', 'wellbeing of society' and 'societal wellbeing'.

changes (for example, improvements in service provision) have been communicated to the public and how well society is responding to earlier policy initiatives.

Analyses such as these often rely on mean scores from groups of items that purport to measure a single underlying construct. The use of mean scores in comparative (e.g. time-series or cross-national) analyses requires that the survey items demonstrate measurement invariance⁴: that for all groups (e.g. time points or countries), these items are equally representative of the underlying construct(s). However, this is often simply assumed and without testing the level of measurement invariance it is not possible to know whether one's results can be meaningfully interpreted.

This chapter examines the degree of measurement invariance demonstrated by a subset of Harrison et al.'s (2011) indicators of the progress of society, within a UK dataset. The full set of indicators comprises some domains that are relatively well-established (such as *social trust*) and others that appear to be new to the field (such as *evaluation of national performance*). At the time of writing, no large-scale dataset measures the full range of indicators. This chapter therefore examines the measurement invariance of thirteen items that cover four domains: *social trust*, *trust in institutions*, *evaluation of national performance* and *perceived quality of public services*.

⁴ I use the terms 'measurement invariance' and 'measurement equivalence' interchangeably.

In the sections that follow, I give a brief overview of Harrison et al.'s (2011) proposed indicators and the goals of measurement invariance testing (a fuller description of each can be found in Chapter 1 (Section 1.1.2) and in Section 2.2.3 of this chapter, respectively). I then discuss each of the above domains in turn, describing its theoretical and empirical associations (where available), and any theoretical and empirical bases for my expectations regarding the items' factor structure and degree of measurement invariance. Finally, I report on the methods used to test my hypotheses and the results obtained.

2.1.1 Subjective indicators of the progress of society

Harrison et al.'s (2011) measures of the perceived progress of society include items relating to other people within society, as well as institutions and their performance. Lockwood (1964) identifies the quality of relationships amongst individuals within society as an issue of *social integration*, and that of relationships between parts of society (such as its institutions) as issues of *system integration*. On this basis, Harrison et al. (2011) propose a set of items that function as indicators of the progress of society. Measures of social trust, tolerance, social conflict, perceived distributive justice and anomie fall within *social integration*, while *system integration* comprises trust in institutions, evaluation of national performance, provision of public services and perceived quality of public services. Harrison and colleagues also propose measures for *overall perceptions of society*: satisfaction with

society, intention to emigrate/ remain, and situation of society relative to time and place (see Chapter 1, Section 1.1.2, for a fuller discussion).

These measures aim to tap not only the individual's evaluation of how well society is functioning but also their judgement regarding whether any suboptimal performance is problematic. This permits evaluation of whether an objectively poor level of progress is detrimental to the functioning of society. These foci stand Harrison et al.'s (2011) set of indicators aside from the typical measures of societal wellbeing (which tend to aggregate individual wellbeing) and from those that measure social cohesion (which tend to ask respondents' own level of, for example, tolerance, rather than asking the respondent to evaluate the level of tolerance within society).

Before they can be used substantively in comparative research, the measurement properties of these domains should be tested both across time and cross-nationally. As noted above, no single dataset offers measures for all twelve domains. In this study, I therefore test (using UK data only) the degree of measurement invariance over time of four domains: *social trust*, *trust in institutions*, *evaluation of national performance* and *perceived quality of public services*. Full measurement invariance comprises three hierarchical elements: configural, metric and scalar invariance. Configural invariance would indicate that each item loads on the same factor(s) at each time point, metric invariance that the item is measured on the same scale across time, and scalar invariance that it holds similar relationships with the other

items that load on the same factor (Section 2.2.3 below offers a more detailed discussion of measurement invariance).

The remainder of this Introduction describes each of the four domains in turn: what the domain measures, its associations with other constructs, and any existing theoretical and empirical literature relating to whether the items should measure a single underlying construct. Where available, this information informs my expectations regarding the behaviour of these survey items when subjected to confirmatory factor analysis (CFA) and multi-group confirmatory factor analysis (MGCFA).

2.1.2 (Generalised) social trust

Broadly speaking, trust is defined as the belief “... that others will not deliberately or knowingly do us harm, if they can avoid it, and will look after our interests, if this is possible” (Delhey & Newton, 2005: 311). In the case of *generalised social trust*, the truster applies this belief to the unknown other on the basis that most people can be trusted irrespective of demographic, social or cultural dis/similarity to themselves (Uslaner, 2002). The paragraphs that follow give a brief overview of the theories regarding where social trust comes from and describe its empirical associations in multivariate analyses.

What drives social trust?

There are several theories of the origins of generalised trust. Some regard the propensity to trust as inherent to the individual and predominantly determined by attributes such as personality traits (*personality theory*; Delhey & Newton, 2003) or values (the theory of the *moral foundations of trust*; Uslaner, 2002), while others emphasise social aspects such as the individual's standing (*success and wellbeing theory*; Delhey & Newton, 2003) and participation in their social environment (*voluntary organisations theory* and *social networks theory*; Putnam, 2000). And finally, two theories highlight the importance of the broader social and societal context in which the individual lives (Delhey & Newton, 2003), citing the relevance of the local area (*community theory*) and the broader society (*societal theory*) to individuals' levels of social trust. These latter two theories bear strong resemblance to *institutional theory*, which posits that generalised trust is associated with the behaviour of local and national institutions both directly (effective order institutions serving to deter untrustworthy behaviour) and indirectly (cooperative, non-corrupt institutions serving as role models to members of the public; Rothstein & Stolle, 2008).

Empirical associations

In regression analyses, self-reported generalised trust tends to be positively associated with a higher level of education (Albanese, De Blasio, & Sestito, 2013;

Fehr, 2008; Naef & Schupp, 2009b), and to show a non-linear association with age such that younger and older people are more trusting while those of working age are less-so (Fehr, 2008). Results regarding its relationships with gender are mixed, with some studies finding higher trust scores amongst males (Naef & Schupp, 2009b) and others amongst females (Albanese et al., 2013; Dohmen, Falk, Huffman, & Sunde, 2008; Gundelach, 2014). These associations hold in multi-level models that also account for variables at the level of society (e.g. Gundelach, 2014; Herreros, 2012; C.-S. Lee, 2013; Park & Subramanian, 2012; Polillo, 2012; Reeskens, 2009; Robbins, 2011; Wang & Gordon, 2011; You, 2012). In addition, socioeconomic indicators such as occupational prestige, household income and the degree of comfort living on that income have been found to be positively associated with generalised trust (Fehr, 2008; Naef & Schupp, 2009b; Paxton, 2007).

Much work has also investigated the associations between characteristics of the country or society and the mean level of social trust across the population sample. Social trust is usually found to be positively associated with indicators of social progress, with higher aggregate levels of trust reported in democratic countries (Uslaner, 2002), those that have a universalistic welfare state (Rothstein & Stolle, 2002), a lower level of inequality (Knack & Keefer, 1997), higher national wealth and a lower level of corruption (Uslaner, 2002). A positive association has also been observed between level of social trust and *trust in institutions* (e.g. Allum et al., 2010).

The sections below describe the measurement of social trust, and discuss the theoretical and empirical literature relating to these items' behaviour in CFA and MGCFA across time.

2.1.2.1 Measuring social trust

The construct used here comprises three measures of social trust: Noelle-Neumann's generalised trust question and two that are taken from the Rosenberg (1957) Misanthropy Scale (Zmerli, Newton, & Montero, 2007). The generalised trust question (GTQ) asks whether other people can be trusted (or if you cannot be too careful), the second question asks whether others would in general seek to be fair (or to take advantage), and the third asks whether others would seek to be helpful (or are mostly looking out for themselves; see Table 2.1, Section 2.2.1 for the full item and response wording).

2.1.2.2 Methodological behaviour: theoretical orientations

The three items measure whether in general others can be trusted, seek to be fair and seek to be helpful. The treatment of these items in the literature indicates that all three are expected to measure one underlying construct, generalised social trust. In this section I discuss the theoretical support for this idea (or the lack thereof).

These items all seek to measure the respondent's evaluations of 'the generalised other', the average stranger one might encounter in the street. However, there do appear to be some differences between them. For example, unlike scenarios that require trust, those involving fairness and helpfulness are not necessarily inherently risky. To regard others as trustworthy is therefore a stronger display of confidence in the generalised 'other' than regarding them as fair or helpful. However, this argument may only be relevant in behavioural contexts and therefore it may not stand in self-report data. When deciding whether to show trust behaviourally, many factors come into play; however, when responding to survey questions we are more likely to draw on our internal sense of optimism regarding the goodness of human nature, that is, our degree of underlying faith that the majority of people are not interested in causing harm but would actually have objectively good intentions. From the opposite angle: if we expect that others will, in general, be looking out for themselves or seeking to take advantage of us, then we would be wise to be cautious rather than trusting.

Despite the differing evaluations sought by these items, it is reasonable to anticipate that they will draw on a common underlying feeling regarding human nature. In theory, it is also likely that these items will demonstrate a degree of measurement invariance across time. Following the discussion above, it seems reasonable to expect this factor model to be maintained across time (configural invariance). Similarly, there is scant reason to anticipate changes to the factor-item relationships (metric invariance) over such a short time span. A test of scalar invariance, however, reflects on the item means at each time point and these may of course vary. It

seems unlikely that the magnitude of any changes in item means between 2004 – 2010 would be sufficient to undermine the integrity of the factor. However, it is possible that events such as the terrorist attacks in London in 2005 had an impact.

I turn now to examine how these items have behaved in methodological tests in the existing literature, examining both evidence relating to the factor structure of these items and their invariance over time.

2.1.2.3 Methodological behaviour: empirical evidence

In analyses of pooled data, a number of studies have found support for the single-factor model of social trust using dichotomous measures and responses on eleven-point scales (e.g. Allum et al., 2010; Allum et al., 2011). In comparative analyses, Reeskens and Hooghe (2008) and Coromina and Davidov (2013) investigate the invariance of the social trust factor across time.

In multi-group structural equation modelling (MGSEM) on data from the first two Rounds of the European Social Survey (ESS; ESS1, ESS2), Reeskens and Hooghe (2008) find that when modelled on one factor, the social trust items achieve metric equivalence across time for sixteen of the twenty countries included in their analyses. This means that the factor loadings are similar across the two Rounds of the survey, permitting meaningful comparison over time of the relationships between the latent constructs (e.g. the relationship between social trust and other

constructs, across time). The items do not, however, demonstrate scalar equivalence so it would be difficult to meaningfully compare mean scores across the two Rounds (Van der Veld & Saris, 2011).

Using data from seven countries (Belgium, France, Germany, Spain, the Netherlands, Portugal and Switzerland), across four Rounds of the ESS (ESS1 – ESS4), Coromina and Davidov (2013) implement MGCFA to test the measurement invariance of the three items across these 28 groups (each country at each time). In a one-factor model, the items demonstrate an acceptable level of metric invariance but do not achieve full scalar invariance across groups. Considering the time-series analyses within each country, only the data from France and the Netherlands achieve scalar invariance across all four Rounds. No scalar invariance across Rounds was observed for Germany or Spain. These results imply that while *social trust* (as measured via these three items) may be meaningfully discussed in relation to other constructs, the potential value in comparing mean *social trust* scores across time varies cross-nationally.

The items within the *social trust* factor have demonstrated configural invariance cross-nationally and across time. However, in the two studies cited there is mixed evidence for metric and scalar invariance. None of the studies found to date have assessed the degree of measurement invariance of these items in a UK sample across time.

2.1.2.4 Summary

This study will initially confirm the basic factor model for the three social trust items using UK data from Round 2 of the ESS. The findings of previous studies encourage confidence that these items will load on a single factor. The findings of Reeskens and Hooghe (2008) and Coromina and Davidov (2013) indicate that the *social trust* factor achieves configural invariance. However, appropriate expectations regarding metric and scalar invariance are less clear.

2.1.3 Trust in Institutions

“Where trust in government used to refer to the belief that government will not become autocratic or allow people to be arrested unjustly, it now refers to more down to earth matter such as the reliability of service delivery or the expectation that policy will correspond to one’s wishes”

(Bouckaert & Van de Walle, 2003: 334)

Here, *institutions* refers to the actors or groups of actors (e.g. politicians or political parties), and the institutions (e.g. parliament or cabinet) that are inherent within the national infrastructure of a democracy. In addition, it also covers the ‘institutions of the Rechtsstaat’; that is, institutions (such as the police) that exist primarily to enforce the law (Denters et al., 2007)⁵. Kotzian (2011: 25) defines institutional trust

⁵ Denters et al. (2007) classify political parties as (groups of) actors. This appears to be in accordance with convention (Global Citizen, 2007)

as the extent to which citizens “trust in the moral integrity of institutions” and “[have] confidence in the capabilities of institutions”. It is theorised that the level of trust an individual will feel towards each institution will vary with their knowledge of the institution, their socio-demographic and socio-economic background, and their perception of the quality of that institution (Hudson, 2006).

It is widely noted that trust in political institutions has substantially declined since the 1960s (Bouckaert, Van de Walle, Maddens, & Kampen, 2002; Inglehart, 1999; Nye, Zelikow, & King, 1997; Putnam, 2000). Theories around this loss of trust primarily focus on socio-cultural and political factors: the loss of generalised trust within society and its subsequent impact on trust in institutions, the rise of ‘cognitive mobilisation’ and the hypothesised heightened prevalence of postmodernist values (and the subsequent change in citizens’ policy preferences and their evaluation criteria when assessing institutions’ trustworthiness). Other theories include the existence of a ‘culture of distrust’ (in which it is fashionable or socially acceptable to denigrate political actors and institutions) and a subsequent ‘spiral of silence’, in which citizens who disagree with the popular view feel too discouraged to voice their opinion honestly (Van de Walle & Bouckaert, 2003). Finally, the media are widely cited as a causal mechanism in the reported deterioration of trust in institutions, avidly recounting tales of questionable behaviour amongst the political elite (Inglehart, 1999; Nye et al., 1997).

While critical evaluation of institutions is regarded as healthy in a democratic setting (Hooghe et al., 2011; Kaase, 1999; Van de Walle, Van Roosbroek, & Bouckaert,

2008), a certain level of trust is important to institutions' continued functioning (e.g. Hetherington, 1998; Marien & Hooghe, 2011). The literature discusses the potential negative consequences of trust dropping below a hypothetical 'critical threshold': negative outcomes for the government include citizen unwillingness to vote (Hooghe et al., 2011) and pay taxes (Bouckaert & Van de Walle, 2003). More seriously, it is feared that a loss of support for the political system could result in a decline in government performance (Hetherington, 1998) and an increase in public support for 'anti-system' parties (Hooghe et al., 2011).

What drives trust in institutions?

As noted above, theoretical accounts of the roots of *trust in institutions* discuss key socio-cultural and political factors. Socio-cultural explanations are built on social capital theory (and the importance of generalised social trust, social inclusion and civic participation to the maintenance of trust in institutions; Putnam, 2000), the valence of citizens' values and political ideology (determining which institutions and individuals they are willing to trust; Levi & Stoker, 2000), and factors such as their cognitive ability (citizens' understanding of contemporary issues will influence which policies they are willing to support; Schoon & Cheng, 2011).

Political factors include institutions' performance (or rather, citizens' perceptions of performance and the proximity to their prior expectations; Van de Walle & Bouckaert, 2003. See Yang & Holzer, 2006, for a review), citizens' perceptions of

institutions' responsiveness (valuing political actors and institutions that are responsive to their needs and preferences; Levi & Stoker, 2000), the presence of one's preferred political party in government (Rothstein & Stolle, 2002), exposure to the media (and reports of corrupt and unethical activities; Bouckaert et al., 2002) and the state of the economy (making life more or less financially comfortable; Hetherington, 1998. See Bouckaert et al., 2002, for a review).

Empirical associations

In cross-national, multivariate analyses on pooled data (the 21 countries in ESS1) and controlling for society-level attributes (corruption, GDP, income inequality, unemployment, inflation and cabinet stability), Kotzian (2011) examined the predictors of trust in parliament, politicians, the police and the legal system. He found that trust is significantly associated with key demographic variables such as gender (females being more trusting), age and education (mixed findings across institutions). In addition, feeling close to a political party (not necessarily the one in power), a higher level of political efficacy and feeling that politicians care about their citizenry are each positively associated with level of trust. However, being a member of a minority group is associated with reporting a significantly lower level of trust than the majority, and for each predictor variable the results vary across institutions. Satisfaction with macro- and micro-performance (as one variable) is significantly and substantially predictive of trust in all four institutions. Other studies have noted significant positive associations between trust and attitudes towards law abidance

(Marien & Hooghe, 2011) and reported levels of social trust (Allum et al., 2010; Allum et al., 2011).

At the level of society, Kotzian (2011) reports that each of the characteristics listed above is significantly predictive of trust in most institutions. However, the direction of the association for each predictor varies across institutions.

The remainder of this section will discuss the measurement and methodological characteristics of *trust in institutions*. A review of the existing theoretical and empirical literature will guide my expectations regarding the behaviour of these items when subjected to CFA and MGCFA.

2.1.3.1 Measuring trust in institutions

Trust in institutions is often assessed via a battery of items that measure respondents' trust (or confidence) in a range of national institutions and actors. The ESS measures respondents' trust in parliament, political parties, politicians, the legal system and the police. This is a somewhat modest array of institutions when compared to those evaluated in other surveys (e.g. the European Values Study, which additionally includes measures of trust⁶ in the military, church, press and civil service).

⁶ Some surveys instead measure *confidence* in institutions, however, these are regarded and treated as interchangeable with measures of *trust* in institutions.

In the sections that follow, I review the existing theoretical and empirical literature relating to the measurement invariance of these items. Due to the variance in the set of institutions evaluated across different instruments, I discuss only those studies that use ESS data.

2.1.3.2 Methodological behaviour: theoretical orientations

The items in this domain measure citizens' trust in separate but related institutions. The existing literature discusses two possible factor models for the *trust in institutions* items: (a) Denters et al. (2007) propose that the different types of institution will load on three separate factors: political actors, political institutions and the order (Rechtsstaat) institutions; and (b) Hooghe (2011) describes a two-factor solution: the political institutions (comprising both political actors and institutions) and the order institutions.

Denters et al. (2007) hypothesise that citizens differentially evaluate the political actors (politicians and political parties) and institutions (parliament) of a democracy, and separately again the enforcement institutions (the police and the courts). However, they do not appear to cite a theoretical basis for their hypothesis but base it on the findings of earlier empirical research. It may make sense to theorise that citizens will evaluate individual actors within the political system differently to the institutions, similarly to the way one might differentiate between showing support for the incumbent government versus showing support for the political regime.

However, it is not yet clear that respondents consider the question of political trust in this way: whether, when asked how much trust they have in Parliament, the respondent considers how much trust they have in Parliament as a regime, or Parliament as a collection of politicians and political parties (Easton, 1975).

A somewhat popular theory is that the items measuring *trust in institutions* load onto two factors: *political trust* and *trust in the law*. This is perhaps due to the public's differing relationship with the two sets of institutions (Kotzian, 2011; Thomas, 1998). As authorities, the legal institutions exist independently of the public vote, while members of parliament are voted into office by the public. It is therefore possible that citizens not only have different expectations of them, but regard them in a different way to the actors within legal (or order) institutions.

The political and the order institutions also have different roles within society and their representations and associations, whether driven by the media or by social discourse, are quite different in character. At least, this should be the case in established democracies; in new democracies and societies with non-democratic regimes, the order institutions may be strongly political (Marien, 2013).

Hooghe (2011) offers support for the proposed single factor behind political actors and institutions, citing the 'cognitive miser' and 'satisficing' concepts, and the embeddedness of all political actors and institutions within a single culture. The cognitive miser effect suggests that individuals evaluate the institution they are most familiar with and extrapolate this to form judgements on the remaining

institutions. *Satisficing*, in its weaker form, may result in a respondent giving answers that are less than accurate but are approximately representative (i.e. giving an answer that is ‘good enough’). In its strong form, *satisficing* can result in a respondent’s data bearing little or no relation to their actual perspective: the respondent simply offers “a reasonable answer without referring to any internal psychological cues specifically relevant to the attitude, belief, or event of interest” (Krosnick, Narayan, & Smith, 1996: 31).

Hooghe’s (2011) second theory regarding the reason why trust in political actors and political institutions should be rooted in a single attitude relates to the way we perceive the overriding political culture at the time: political actors and institutions within a nation all “... share the norms of the same political culture, and therefore they will behave in the same corrupt or trustworthy manner”. Hooghe further explains that “... as a heuristic shortcut, it makes sense to arrive at a comprehensive judgement on political trust, since we know the behaviour of politicians and institutions will be determined mainly by the political culture, which is a system characteristic, not a characteristic of the specific institution” (Hooghe, 2011: 274).

Hooghe’s (2011) position does have intuitive appeal. While it appears that no comparable argument has been presented relating to why levels of trust in the order institutions should be drawn from a single underlying attitude, it seems reasonable to expect that similar processes to those conjectured for *political trust* may apply. Having discussed the potential factor structure of these items, I now consider the likelihood that the model will be invariant across time.

As noted earlier, configural invariance would indicate that the items fit the same factor structure across time. The UK being an established democracy should mean that the public view its political and legal institutions as distinct entities (Marien, 2013), resulting in separate evaluations. However, it is difficult to use logic to inform any expectations regarding the potential for the *trust in institutions* model to achieve metric or scalar invariance.

2.1.3.3 Methodological behaviour: empirical findings

Analyses using ESS data pooled across countries has generated single-factor (Listhaug & Ringdal, 2008; Marien, 2013) and two-factor (e.g. Allum et al., 2010) models for *trust in institutions*. The lack of a three-factor solution may in part be due to the number of items in the ESS, which offers only five in comparison to the seven available to Denters et al. (2007). This may reduce the potential for observing differential factor loadings between Denters et al.'s three types of institutions.

It has not been possible to identify any prior studies that have evaluated the measurement invariance of these factor models over time.

2.1.3.4 Summary

As discussed above, there are theoretical and empirical reasons for expecting CFA on the five ESS items measuring trust in national institutions to result in a two-factor solution. It appears that the longitudinal measurement invariance of the five items fielded in the ESS is yet to be tested.

In implementing CFA to test the factor structure of these items, I expect to find a two-factor model for ESS2: *political trust* (trust in politicians, parliament and political parties) and *trust in the law* (trust in the police and the legal system). While there are no existing findings to suggest whether the model should achieve configural, metric or scalar invariance, due to the UK being an established democracy I would expect the factor structure to be invariant over time. However, it is not clear whether I should expect this model to demonstrate metric or scalar invariance.

2.1.4 Macro-performance: evaluations of national performance

This domain seeks to capture citizens' satisfaction with institutions' performance at the macro-level (i.e. the national government). Due to a lack of prior research that conceptualises *evaluations of national performance* in this manner, I have encountered no prior literature that discusses its drivers and empirical associations. I therefore base my consideration of these on the available related literature.

What drives evaluations of national performance?

Evaluations of national performance should, to some extent, reflect actual performance. However, similarly to *trust in institutions*, evaluations of national performance are likely to be influenced by individuals' positive or negative bias towards the political incumbents: evaluations may be instinctively upgraded (during the term of a political party one supports) or downgraded (when a party one opposes is in power). While it is not possible to accurately determine the extent of such a bias, controlling for the presence in power of the individual's preferred party may help to account for the variance in ratings. In addition, geographical region and socio-economic status are likely to have an impact, with those who are most negatively affected by (perceived) poor performance reporting the worst evaluations.

After describing the measurement of *evaluation of national performance*, a review of the existing literature will establish the level of theoretical and empirical support for the idea that these three items measure a single construct and whether we should expect the factor model to be invariant across time.

2.1.4.1 The measurement of evaluations of national performance

These three measures ask respondents to rate their satisfaction with the way democracy works in this country, the performance of the economy and the way the government is doing its job. These items are often worded similarly in different surveys but their response scales do vary. Although each of these items has been widely used in previous studies, I am yet to find any instance of them being used as measures of a single latent construct.

2.1.4.2 Methodological behaviour: theoretical orientation

Due to the lack of existing work that uses these items as measures of a single construct, I refer back to their theoretical origins. In discussing Fuchs' forms of political support, the ESS Core Questionnaire Development Document (Thomassen, 2001: Chapter 5) identifies the items measuring satisfaction with the state of the economy and the performance of the government as tapping the respondent's level of satisfaction with the 'day-to-day output' of the authorities. This is described as an indicator of the respondent's specific support for the authorities, borne of their perceptions of the short-term utility of the outputs the authorities generate. Scores on these two measures are likely to vary with perceived changes in the nature or quality of such outputs.

The remaining item, satisfaction with democracy, is purported to measure neither specific nor diffuse support (Easton, 1965; Kim, 2009) and there is some debate regarding quite what it does measure (see Canache, Mondak, & Seligson, 2001, for an overview). Diffuse support is characterised as “... a reservoir of favorable attitudes or good will that helps members to accept or tolerate outputs to which they are opposed or the effect of which they see as damaging to their wants” (Easton, 1965: 273). A high level of diffuse support is therefore able to withstand the observation of contraventions to one’s preferences, even though specific support may wane. While this may apply well to support for democracy (which is generally regarded as the best regime of those available), ‘satisfaction with the way democracy works in this country’ is likely to reflect one’s feelings about the actual choices available – for example, whether these permit a clear preference regarding which party to vote for.

The state of the economy and the continuance of an effectively functioning democratic regime are both heavily influenced by the government. Degree of satisfaction with the government may therefore parallel satisfaction with either the functioning of democracy or the state of the economy. It seems feasible that the interdependence of these measures will draw them together as measures of a single construct, particularly if they were to tap the individual’s underlying level of support for the system (for example, one’s preferred political party being in power may result in a positive bias towards all aspects of performance).

It appears possible that, in statistical analyses, these items will load on one factor. However, given the lack of a firm theoretical or empirical foundation to this domain it is not possible to estimate whether its factor model is likely to be invariant across time.

2.1.4.3 Methodological behaviour: empirical evidence

With the lack of previous research into the factor structure of these three items, I draw inferences regarding their likely associations from studies that have investigated the drivers of satisfaction with democracy.

Satisfaction with democracy has been found to be sensitive to self-reported pessimism regarding the future trajectory of the national economy (Kim, 2009), to an objectively-measured drop in the rate of economic growth (Fuchs & Klingemann, 1995. Cited in ESS, 2001: 186) and to the quality of national institutions as indicated by objective measures of, for example, the level of corruption and the quality of the 'rule of law' (Wagner, Schneider, & Halla, 2009). Although a little abstract, these findings do offer some support for the notion that the three measures of satisfaction – with democracy, the government and the state of the economy – may measure a single underlying construct.

Clearly, citizens' level of satisfaction with these aspects of national performance is likely to vary over time with changes in the country's political and economic

landscapes. However, it is not clear whether such changes would influence these items' methodological interdependence.

2.1.4.4 Summary

The lack of a proper theoretical foundation or empirical evidence for the factor structure of these items makes it unrealistic to attempt to predict whether their factor structure will hold and, if it does, whether this model will demonstrate configural, metric or scalar invariance over time.

2.1.5 Micro-performance: perceived quality of public services

In some cases, public services are coordinated at the national level (such as the UK state pension) and, in others, responsibility is held at the level of local government or other local agencies (for example, public transport). Services can differ on a range of dimensions, such as their aims and measurable service objectives, plus of course the subjective and objective value of the services they provide. The quality of these services can have a massive impact on service users' lives.

Evaluations of the quality of public services clearly indicate the un/favourableness of citizens' views of these services and operate as important feedback mechanisms for the authorities particularly regarding attempts to improve services or to improve

communication to citizens about these services (Morgeson & Petrescu, 2011). Similarly to *evaluation of national performance*, there appears to be no empirical literature on the drivers of perceptions of the quality of public services. Below, I briefly discuss the factors that may influence subjective evaluations of the quality of public services, and then discuss the measurement of this domain and any theoretical and empirical literature relating to its likely behaviour in CFA and MGCFA models. Finally, I outline my hypotheses and research questions.

What drives perceived quality of public services?

It is assumed that perceptions of the quality of public services are driven by one's experiences of using these services (Bouckaert & Van de Walle, 2003), as well as exposure to reports in the media and social dialogue. However, differences in expectations (Bouckaert & Van de Walle, 2003), priorities and frequency of exposure to these services are likely to affect individuals' perceptions.

Perceptions of the quality of public services may also depend upon factors such as one's awareness of which authority provides the service (Christensen & Lægheid, 2005; DeHoog, Lowery, & Lyons, 1990). For example, one may feel that a particular authority is ineffectual or corrupt, or simply that its services are inadequate or over-priced: services that the respondent believes to be provided by this authority may all, through a process of generalisation, be deemed unsatisfactory (Bouckaert et al., 2002; Easton, 1975). Mode of service delivery may also influence perceptions due to

accessibility, for example, a service that uses increasingly technological means may risk alienating those without access to the newer technology.

The ESS measures evaluations of services relating to health and education, which are largely delivered personally to the public by other individuals. This introduces a range of confounding influences on the quality of service provision both within and between local areas. However, services that are coordinated at the local level should be better tailored to meet the needs of the community and should be of a subjectively higher quality.

2.1.5.1 Measurement of perceived quality of public services

The ESS asks respondents to rate the quality of just two public services: the health service and the education system. Other surveys measure a higher number of services, for example, the European Quality of Life Survey in 2007 sought evaluations of health services, the education system, public transport, care services for the elderly and the state pension system. It is clear that findings from analyses on one set of services should not be expected to apply to different sets of services.

2.1.5.2 Methodological behaviour: theoretical expectations

Similarly to *evaluation of national* performance, there appears to be no prior work that uses these measures as a single domain. Given the range of potential drivers of evaluations of the quality of public services (as discussed above), it is not clear whether these measures are likely to draw on a single latent construct. The importance placed on health care and education, and their strength as media and policy topics, may mean that these two services prompt well-defined evaluations rather than the catch-all ratings borne of heuristic processing⁷ (which may be satisfactory for less visible and less emotive services).

With regard to the potential for these items to demonstrate measurement invariance over time: it is fair to expect estimations of the quality of public services to vary with changes to service provision. Unless changes to one service signal changes to another, it is not clear why these items should maintain a degree of inter-reliance over time.

2.1.5.3 Methodological behaviour: empirical findings

Searches of the existing literature have not produced any studies that empirically test the associations between evaluations of the quality of different public services.

⁷ 'Heuristic processing' is used here to indicate "... information-processing rules of thumb that enable us to think in ways that are quick and easy but that frequently lead to error" (S. Brehm, Kassir, & Fein, 1999: 104)

2.1.5.4 Summary

It is unclear whether the specific items available in the European Social Survey should be expected to correlate highly with each other and whether the correlation they achieve should be invariant over time. However, due to the low number of items and the nature of these two services with respect to their key delivery characteristics (Kampen, De Walle, & Bouckaert, 2006), the results obtained here must be viewed with caution and should not be generalised to alternative measures that comprise a different set of services.

2.1.6 Hypotheses and research questions

The aim of this study is to test the measurement invariance over time of a set of thirteen items measuring four or five underlying constructs. The first stage in the analyses is to test the factor structure of the individual domains: *social trust*, *trust in institutions*, *evaluation of national performance* and *perceived quality of public services*:

Hypothesis 1 The *social trust* items will generate a one-factor model.

Hypothesis 2 The *trust in institutions* items will form a two-factor model: *political trust* and *trust in the law*.

Research question 1 Will the *evaluation of national performance* items form a one-factor model?

Research question 2 Will the two *quality of public services* items demonstrate a strong correlation?

The next stages involve compiling a unified model and testing different levels of measurement invariance for this model as a whole. The final research question is therefore broader:

Research question 3 Will the model achieve configural, metric and scalar invariance over time?

2.2 Data and Methods

2.2.1 Data

This study uses data from the European Social Survey (ESS). First fielded in 2002, the ESS is a biennial cross-national survey that takes a representative sample of the population aged 15 years and above in each participating country. The National Coordinators in each country determine an appropriate sampling frame and the

samples are weighted such that when the population weights are applied each country has a sample of 1500 respondents⁸.

The high methodological standards adhered to in the development, fieldwork and maintenance of the ESS make its data an attractive prospect for analysis. In addition, the ESS website offers comprehensive survey documentation as well as information about any anomalies or deviations in the questionnaire design, fieldwork or data⁹. The analyses in this chapter use only data from the United Kingdom. Across the lifetime of the ESS, the unweighted sample size for the UK is around 1500 – 2500.

This study initially uses data from Round 2 of the ESS (ESS2) to develop a measurement model and then tests this model in multi-group confirmatory factor analysis (MGCFA) on Rounds 2 – 5 of the survey (ESS2 – ESS5; fieldwork implemented in 2004 - 2010). The MGCFA uses a cumulative dataset comprising UK data from ESS2 – ESS5. The first Round of the ESS (ESS1) is not used in this study due to one of these items being absent from its questionnaire.

Items and measurement scales

This study uses thirteen items from the core questionnaire of the ESS. As described above, these items are theorised to measure five underlying evaluations. All items

⁸ Design weights are also available, to account for between-respondent differences in the likelihood of being sampled.

⁹ The survey data and documentation are publically available via www.europeansocialsurvey.org.

are measured on eleven-point scales with anchored end-points; the full question and response scale wording for each item is in Table 2.1 below.

Table 2.1: Items used, including question wording and response scale

Item name	Item wording	Response scale
Social trust		
ppltrst	... generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?	0 (You can't be too careful) – 10 (Most people can be trusted)
pplfair	... do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?	0 (Most people would try to take advantage of me) – 10 (Most people would try to be fair)
pplhlp	Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?	0 (People mostly look out for themselves) – 10 (People mostly try to be helpful)
Trust in political institutions		
	... please tell me... how much you personally trust each of the institutions I read out...	0 (No trust at all) – 10 (Complete trust)
trstprl	... [country]'s parliament?	
trstplt	... politicians?	
trstprt	... political parties?	
Trust in the law		
	... please tell me... how much you personally trust each of the institutions I read out...	0 (No trust at all) – 10 (Complete trust)
trstlgl	... the legal system?	
trstplc	... the police?	

Item name	Item wording	Response scale
Evaluation of national performance		
stfec0	On the whole how satisfied are you with the present state of the economy in [country]?	0 (Extremely dissatisfied) – 10 (Extremely satisfied)
stfgov	Now thinking about the [country] government, how satisfied are you with the way it is doing its job?	
stfdem	And on the whole, how satisfied are you with the way democracy works in [country]?	
Perceived quality of public services		
stfedu	... please say what you think overall about the state of education in [country] nowadays?	0 (Extremely bad) – 10 (Extremely good)
stfhlth	... please say what you think overall about the state of health services in [country] nowadays?	

Source: European Social Survey Round 3 Core Questionnaire (ESS, 2006)

2.2.2 Methods I

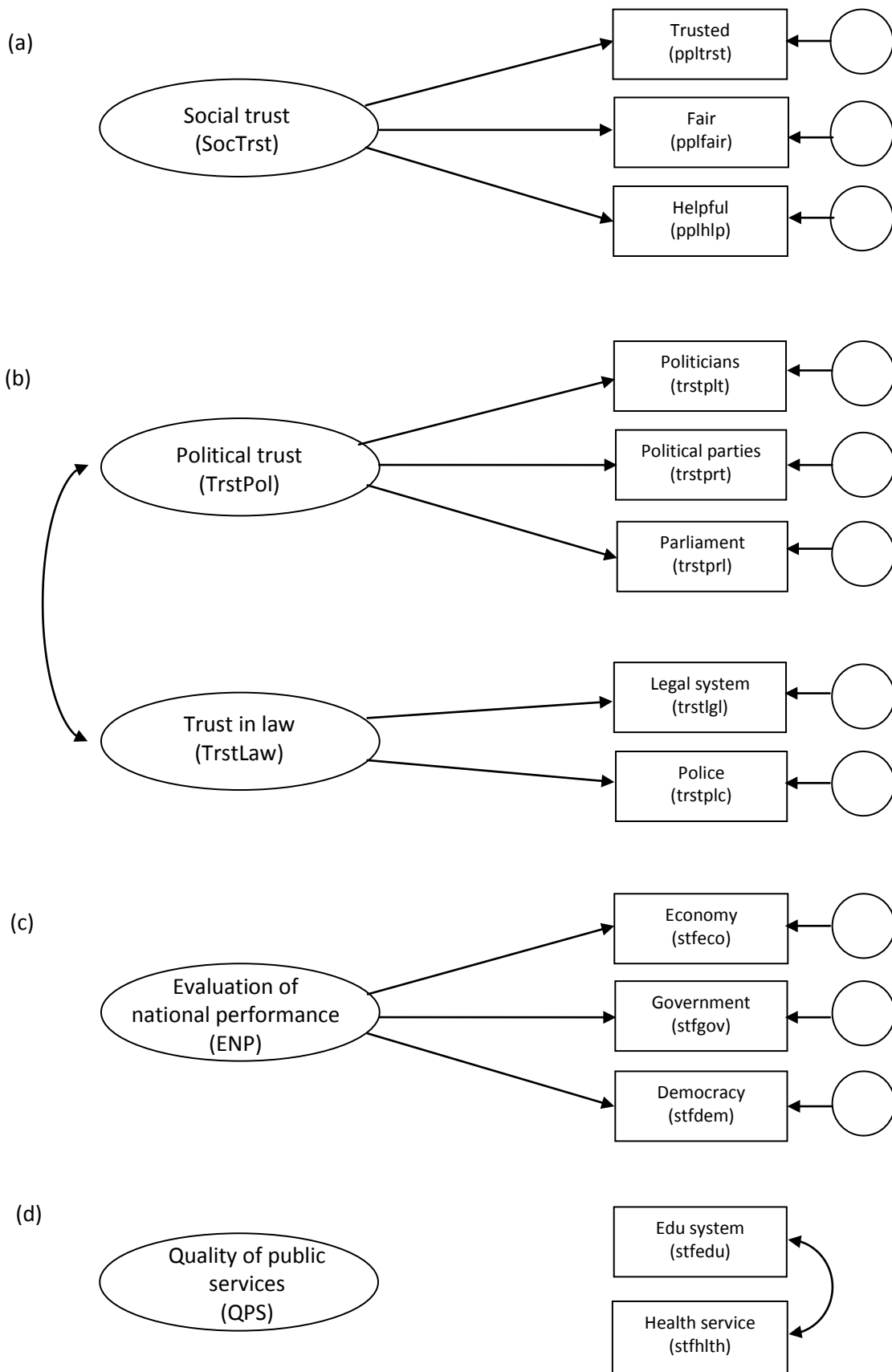
Step 1: Testing the factor structure for each domain

This first phase of the analyses uses confirmatory factor analysis (CFA) to test whether the indicators measure their theorised underlying constructs (Figure 2.1), and also to test how well the full measurement model fits the data (Figure 2.2). The measurement model specifies which items should measure each latent construct. CFA estimates the proportion of the variance in the observed variable (item) that is explained by the factor mean (latent construct).

Factor analysis considers the relationship between the respondent's score on the factor (e.g. *political trust*) and their score on the individual item (e.g. trust in politicians), investigating this relationship across a high number of respondents. The more closely the item score (trust in politicians) tracks the factor score (*political trust*), the higher the factor loading for that item. The factor loading is the proportion of item variance that is explained by variance in the factor.

I implement CFA using the statistical programme Mplus. Where a factor is hypothesised to be formed by only two items, I perform correlation analysis (rather than CFA) to determine the strength of their association.

Figure 2.1: Individual factors (ESS2)



Items sourced from: European Social Survey (Round 2, 2004)

Step 2: Developing a measurement model for the five factors

This step generates a measurement model for the full thirteen items (Figure 2.2) using data from ESS2. The presence of other indicators in the model may potentially challenge the integrity of the expected factors, so this analysis provides a more robust test than the single-domain CFA models. The modification indices may identify alterations to the specified model, however, it is important to consider their theoretical worth before adopting them. I test the resulting model for ESS2 using data from ESS3 – ESS5 (Step 3) and, finally, on all Rounds (using MGCFA) to establish the degree of measurement invariance of these items over time (Step 4).¹⁰

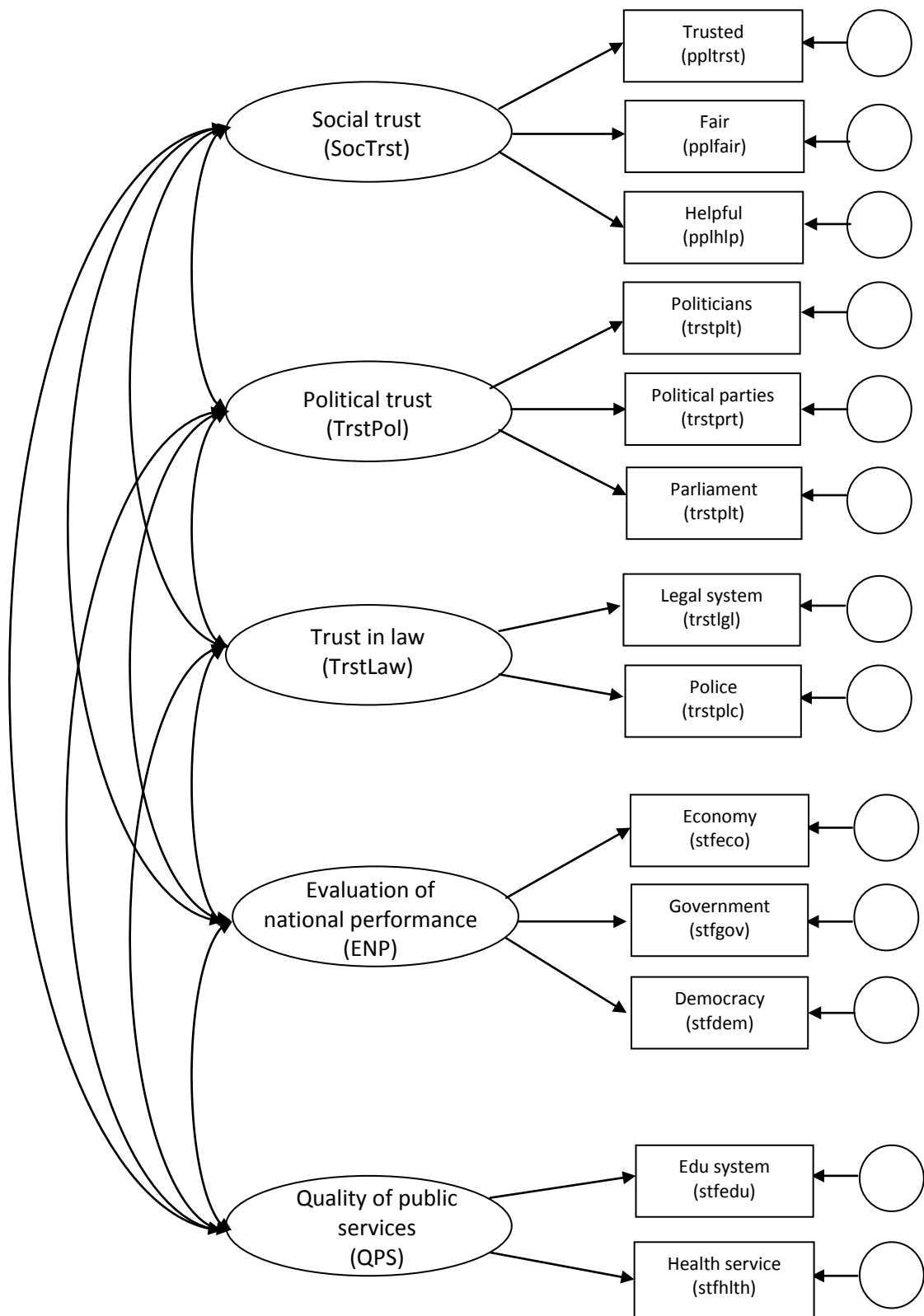
Model fit

In assessing the goodness of fit for each model tested, I give particular attention to the Chi-square statistic, the Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI). A well-fitting model should have a RMSEA value below 0.05 and a CFI value above .95. The fit indicated by the Chi-square statistic is relative to the number of degrees of freedom (*df*) in the model: dividing the Chi-square by the degrees of freedom should give a result below or approximately equal to 3.00. However, the Chi Square statistic is sensitive to sample size. When testing the measurement model on individual Rounds, the sample will be between 1500 and

¹⁰ The use of modification indices to inform adjustments to my models does mean that they will be rather data driven. This is appropriate because my goal in this chapter is to identify how I can use these items in substantive research. However, my resulting models should not be applied to other datasets without appropriate testing.

2500, however, in multi-group analyses it will reach nearer to 9,000. This means that I may obtain a statistically significant Chi-square value, indicating poor model fit, despite the model being a good fit to the data (Byrne, 2012).

Figure 2.2: Measurement model – MGCFA – Model B1



Items sourced from European Social Survey (Round 2, 2004)

2.2.3 Methods II

The second aim of this study is to ascertain the degree of measurement invariance of this model over time. As discussed earlier, Step 3 tests how well the measurement model identified for ESS2 fits the data from ESS3 - ESS5. Multi-group CFA then establishes whether any variation in the measurement model across these Rounds is statistically significant. The methods for testing this and the implications of the different possible outcomes are discussed in Step 4.¹¹

Step 3: Testing the measurement model on data from Rounds 3 – 5

This stage in the analyses entails testing the fit of the measurement model from Step 2 when applied to data from the other Rounds. A close fit to the data from these other Rounds would suggest that the model is suitable for testing in time-series analysis.

In the event that the model is not a good fit for one or more Rounds (for example, if one Round requires a different factor structure), it would not be appropriate to include this Round in the multi-group tests of measurement invariance.

¹¹ I note the recent publication by Davidov et al. (2015) that describes a more lenient method, the approximate Bayesian measurement equivalence approach. While it is not possible to examine this here, it would be interesting to compare the models obtained under the two approaches.

Step 4: Testing the invariance of the measurement model across Rounds 2 – 5

A series of steps need to be followed in order to assess configural, metric and scalar invariance across time (e.g. Brown, 2006). These three forms of measurement invariance are hierarchical, such that metric invariance requires configural equivalence, and scalar equivalence requires both configural and metric equivalence.

Configural equivalence is the lightest test of measurement invariance, establishing whether the factor structure formed by the items is invariant across groups (in this case, across time). Configural invariance will be evidenced in the ESS2 – ESS5 measurement model if the pattern of factor loadings is the same across Rounds. If achieved, it will show that each construct measures the same thing across these Rounds of the survey.

To achieve *metric equivalence* requires that, in addition to having the same factor structure, the factor model reports statistically similar factor loadings across time. Achieving equivalent factor loadings would indicate that the item is measured on the same scale across Rounds of the survey, so a unit change in the item in Round 2 is equivalent to a unit change in Rounds 3 – 5. Metric invariance in the measurement model would indicate that the relationships between the factors can be compared across groups, for example via examination of their covariances and unstandardised regression coefficients (Davidov et al., 2015).

In order to achieve *scalar invariance*, the intercepts for all items must be invariant across groups. The item's intercept is its predicted score when the factor score is zero. The item's intercept describes its relationship with the latent variable (factor), so for each item, this value acts as its 'origin' (NSD, 2013a). Were the observed variables perfectly representative of the underlying construct, their intercepts would be zero – tracking each other and the factor exactly and receiving identical scores. Intercept invariance would indicate that the item is similarly representative of its factor across time.

If all items that load on a single factor are consistently driven primarily by the factor mean (the underlying construct), the relationship between the factor and each item should remain approximately constant and the intercepts should be invariant across groups. A non-invariant intercept could occur if, for example, a media scandal has caused citizens' trust in politicians to drop but not their trust in political parties or parliament. Here, the drop in trust in politicians would not be driven by a change in the respondent's underlying evaluation of political institutions, but rather by current affairs relating specifically to the trustworthiness of politicians. The relationship between this item and the underlying construct would therefore have changed.

Scalar invariance would permit comparison of the factor means (i.e. mean scores on *social trust*, *political trust*, etc.) across the Rounds tested. In the event that the model does not achieve full scalar equivalence, it may be possible to report partial invariance.

Reporting partial scalar invariance

In a partially invariant model, a non-invariant intercept is not problematic provided that three criteria are met: (1) The factor holds at least two other items that have invariant intercepts, (2) the non-invariant intercept can be explained, and (3) the non-invariant intercept has no substantial impact on the value of the factor mean (e.g. Brown, 2006; Byrne, 2012). It is important to check that these requirements are met before determining that partial measurement invariance is an appropriate solution to the factor analysis. Should investigations show that the solution fails on one or more of these criteria, it may be necessary to eject from the factor the item with the non-invariant intercept. In the example given above, this would entail removing ‘trust in politicians’ from *political trust*, allowing it to join the model separately on its own factor.

Approach to the analyses

Testing for measurement invariance across groups can be implemented sequentially – testing first for configural equivalence, then for metric and finally scalar equivalence. Alternatively, one can test the most constrained model, scalar equivalence, and work backwards to release constraints as necessary in order to establish which forms of invariance are satisfied. The method used here will be determined by the quality of model fit obtained for each Round at Step 3 (in the

event that the model is a good fit in all Rounds, a test of configural invariance would seem redundant).

2.3 Results and discussion

2.3.1 Data

The first phase of analysis (Steps 1 – 2) uses data from ESS2, fielded in 2004 – 2005. The next phase (Steps 3 – 4) use ESS2 – ESS5 (2004 - 2011). Details of sample size and response rate for each Round can be observed in Appendix 2A.

2.3.2 Sample

Table 2.2 displays the demographic data that describe the ESS respondents per Round alongside the official statistics for the general population in those years. Directly comparable data were not available for every statistic and deviations are noted beneath the table.

Table 2.2: Sample versus population statistics for Rounds 2 – 5 of the ESS

		2004 (%)		2006 (%)		2008 (%)		2010 (%)	
		ESS2	Eurostat ^c	ESS3	Eurostat	ESS4	Eurostat	ESS5	Eurostat
Gender^a									
	Male	48.9	47.8	47.5	48.0	47.6	48.2	45.5	48.4
Age									
	15-24 years	15.2	15.1	14.9	15.5	13.7	15.8	14.5	15.6
	25-49 years	45.3	41.7	41.3	41.5	45.6	41.0	40.5	40.7
	50-64 years	20.8	20.9	23.6	21.0	22.2	21.2	25.0	21.3
	65+ years	18.7	18.9	20.2	18.8	18.5	18.9	20.0	19.4
Education									
	Aged 30-34: ISCED 5-6	32.7	33.6	56.8	36.5	58.5	39.7	47.5	43.0
Unemployment^b									
	Unemployed during last 7 days	5.9	4.7	4.2	5.4	5.0	5.6	5.6	7.8

Data calculated from: European Social Survey (2004 - 2010); Eurostat (Schäfer, Feith, Fritz, Johansson-Augier, & Wieland, 2007)

ESS data weighted by design weight

^a Non-ESS population data calculated from Eurostat data: Eurostat provided 'number of women per 100 men'. In each case there were more women than men. For each Round, the difference was halved and subtracted from 50% to form a "% male" value.

^b Eurostat unemployment data = unemployment rate for that year; ESS rate = % respondents reporting unemployed in last 7 days and either actively looking or not actively looking for work.

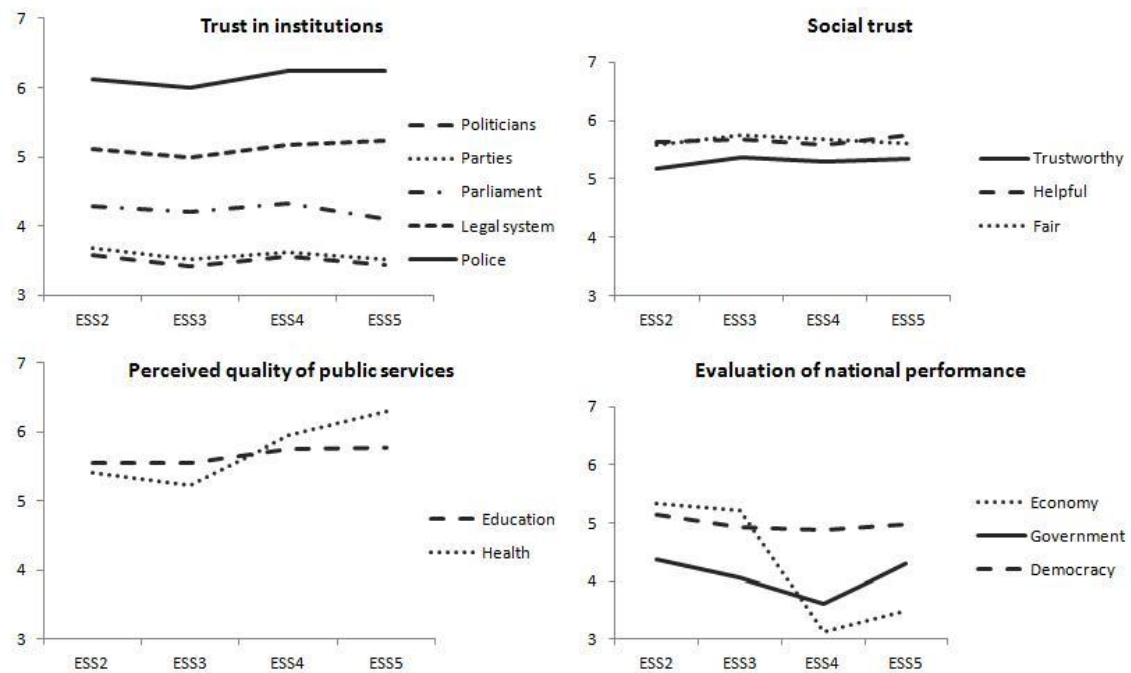
^c Eurostat age data are provided as % of total population. Figures given here have been proportionally adjusted to give approximate % of population aged 15 years and above (due to the method used, these figures marginally underestimate the actual proportions).

Compared to national statistics, the ESS sample generally appears representative of the UK population aged 15 years and above for gender. However, the ESS tends to over-sample 30 – 34 year olds educated to ISCED 5 – 6, and may under-represent people who are unemployed (although note the difference in what these unemployment figures represent; Table 2.2, footnote b).

2.3.3 Item distributions and discussion of trends

Examination of item distributions (Appendix 2B) is useful to check whether the data are normally distributed and that the proportion of missing values is not high enough to cause concern. In the present context, examination of item means across time is likely to give a preliminary indication of whether the items behave as one would expect if they were driven by five latent constructs. I discuss this below, in addition to giving an overview of the implications of the skewness and kurtosis statistics and sample size, and how I handle missing data.

Figure 2.3 below shows the trajectories of the items' mean scores. Within each latent construct items generally appear to track similar routes across time, indicating that in most cases these items are likely to generate the expected factor structure. *Evaluation of national performance*, however, clearly deviates from this pattern with 'satisfaction with the economy' alone dropping two units between ESS3 (2006) and ESS4 (2008). This corresponds to the start of the global financial crisis and may mean that by 2008 'satisfaction with the economy' was being driven by something other than the respondent's underlying level of specific support for the authorities.



Data source: European Social Survey (2004 – 2010)

Figure 2.3a – d (clockwise from top left): Plots illustrating the trajectories of the thirteen items (the hypothesised *political trust* and *trust in the law* factors are merged for the sake of parsimony). In each case, the measurement scale runs from 0 (negative evaluation) to 10 (positive evaluation).

Standard deviations for all indicators fall within the range 1.90 – 2.50, implying that use of the measurement scales is broad but the majority of the responses do cluster to within two to three points of the mean score.

Implications for further analyses and treatment of the data

Skewness and kurtosis These statistics (which report deviation from normality in the horizontal and vertical planes, respectively)¹² indicate that most of these items are not normally distributed. I therefore estimate CFA and MGCFA using the non-parametric robust maximum likelihood (MLR) method rather than maximum likelihood (ML). Robust maximum likelihood uses estimates of standard errors and chi square that are robust to non-normally distributed data (Muthen & Muthen, 2013).

Sample size Some model fit indices are influenced by sample size. Due to the large number of cases in each Round it is likely that some indices will give unreliable results, particularly at Step 4 when multi-group analyses involve a total sample approaching 9,000 cases. In this event it will be necessary to afford less attention to the Chi Square statistic, which is sensitive to sample size.

Missing data The rates of missing data are not so high as to give cause for concern. However, since the purpose of CFA is to investigate the relationships between indicators and groups of indicators, it seems to make little sense to include cases where one or more of these indicators is missing. The analyses conducted for this study will therefore exclude any cases where one or more of these data items is missing (listwise exclusion).

¹² A diagnosis of skew is made if the skewness value for that indicator falls outside the range: $\pm SE(\text{skew}) \times 2$. Similarly, a diagnosis of kurtosis is made if the kurtosis value falls outside the range: $\pm SE(\text{kurtosis}) \times 2$ (UNE, 2000).

2.3.4 Analyses: Phase I

Step 1: Testing the factor structure for each domain

I implemented confirmatory factor analysis or correlation analysis for each theorised factor, using data from a single Round of the European Social Survey (ESS). With the low number of items assigned to each factor, testing the factors individually meant that in most cases there was no possibility of obtaining goodness of fit statistics. The purpose of this first step is therefore to determine how closely each item is associated with the latent construct it is expected to measure. The results from these analyses are given in Figure 2.4 below.

Social Trust It was hypothesised that the three *social trust* items would measure a single underlying construct (*hypothesis 1*). This expectation was supported by the data, with ‘people can be trusted’ (.718), ‘people try to be fair’ (.677) and ‘people try to be helpful’ (.564) loading well on a single factor (see Figure 2.3a).

Trust in Institutions: Political Trust and Trust in the Law In Section 2.1.3, I hypothesised that the *trust in institutions* items represent two factors: *political trust* and *trust in the law* (*hypothesis 2*). However, this model generates fit statistics that are less than optimal ($\chi^2 = 27.259$ (df = 4), RMSEA = .057, CFI = .990, TLI = .976, SRMR = .016), suggesting a misspecification. Examination of the modification indices

suggests permitting a correlation between the residual variances (random measurement error) of two variables within the *political trust* factor: ‘trust in politicians’ and ‘trust in political parties’. This suggestion makes sense theoretically. Re-specifying the model to free this parameter and allow the error terms for these two items to correlate results in improved model fit ($\chi^2 = 6.806$ (df = 3), RMSEA = .026, CFI = .998, TLI = .995, SRMR = .006).

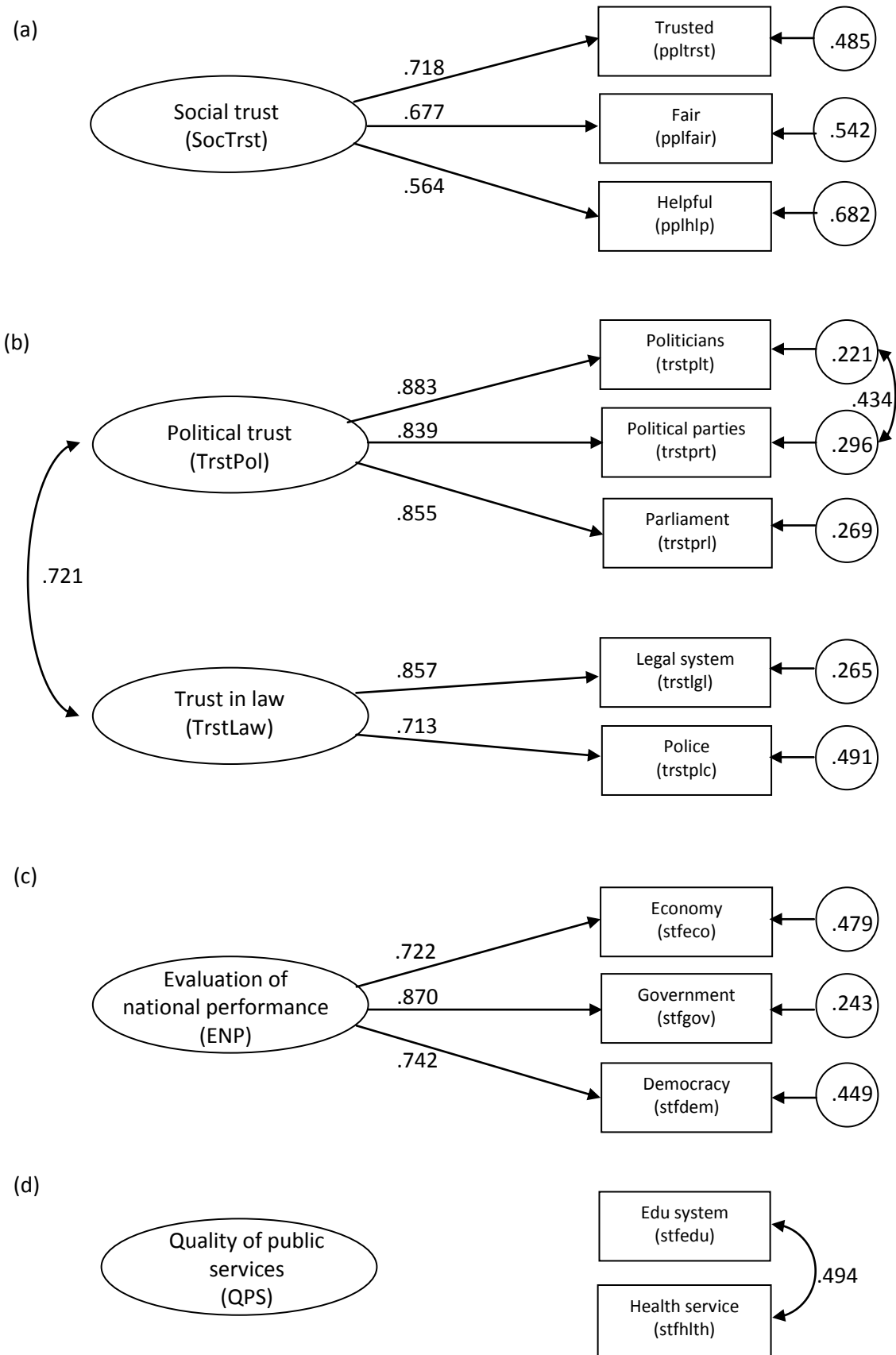
As shown in Figure 2.3b, the three items measuring trust in politicians (.883), political parties (.839) and parliament (.855) load heavily on *political trust*, and ‘trust in the legal system’ (.857) and ‘trust in the police’ (.713) load well on *trust in the law*. The two factors correlate at .721.

Evaluation of National Performance It was not clear whether one should expect these three items to be driven by a single underlying construct (*research question 1*). As shown in Figure 2.3c, a one-factor solution for this domain results in a model in which all items load well on the latent construct, at .772 (‘satisfaction with the economy’), .870 (‘satisfaction with the government’) and .742 (‘satisfaction with democracy’).

Quality of Public Services Again, it was not clear whether one should expect the two items ‘state of education’ and ‘state of the health service’ to correlate (*research question 2*). Spearman’s Rho analysis (for non-parametric data) shows that these items have a medium-strength correlation ($\rho = .494$; see Figure 2.3d).

Summary The items correlate and load sufficiently well that it would be reasonable to test a full measurement model that includes all thirteen items, challenging the factors to maintain their boundaries despite the presence of additional, and quite possibly associated, variables. Step 2 below discusses the findings from this measurement model.

Figure 2.4: Results of Step 1 – individual factors (ESS2 data)



Data sourced from European Social Survey (Round 2, 2004)

Step 2: Developing a measurement model for the five factors

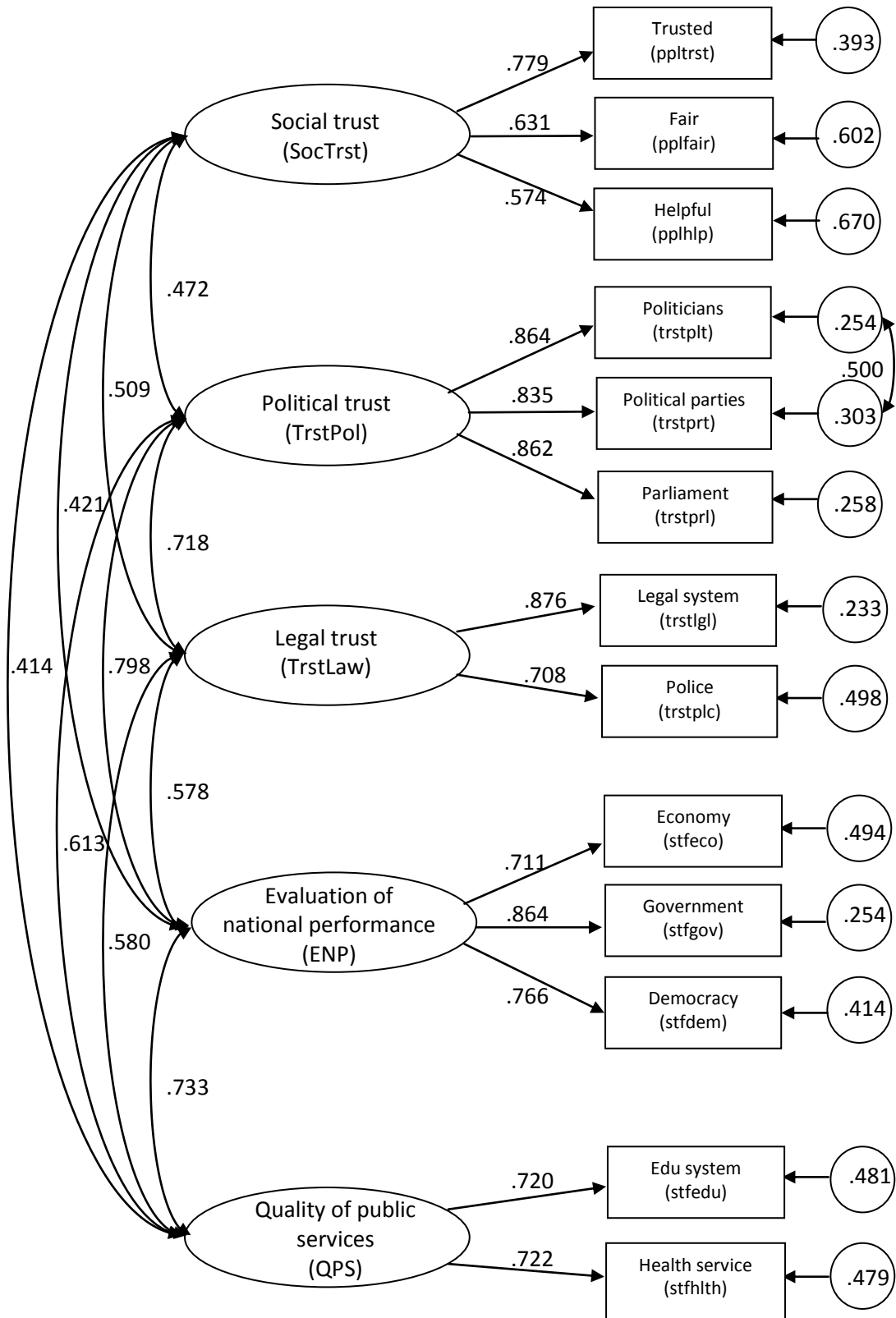
The initial measurement model specifies that the thirteen items should load onto five factors: (a) *social trust*, (b) *political trust*, (c) *trust in the law*, (d) *evaluation of national performance*, and (e) *perceived quality of public services*. This model (without the correlation between ‘trust in politicians’ and ‘trust in political parties’; Model A) was an acceptable fit to the data ($\chi^2 = 212.981$ (df = 55), RMSEA = .041, CFI = .977, TLI = .967, SRMR = .028). However, permitting these two *political trust* items to correlate (Model B) results in a better fit ($\chi^2 = 141.934$ (df = 54), RMSEA = .031, CFI = .987, TLI = .981, SRMR = .023; see Table 2.3). Each factor does maintain its integrity in this model. The resulting (standardised) coefficients from Model B are presented in Figure 2.5.

The factor loadings indicate that the items are substantially driven by their theorised underlying constructs, with around 50 – 75% of the item variance accounted for in most cases. Mathematically, the proportion of variance in the observed measure that is accounted for by the underlying construct is equal to [the factor loading] squared. The proportion of item variance not accounted for by the underlying factor is given as a ‘residual’ or ‘random error’ term: for most items in Model B, 25 – 50% of item variance is unaccounted for by the posited factor, with this rising to 60 – 70% for two of the *social trust* items. Although not problematic to the model, this does suggest that the majority of the variance in these two items is driven by something other than the respondents’ level of generalised social trust.

One other piece of information to note is the factor correlations which are generally moderate to strong, however, the correlation between *political trust* and *evaluation of national performance* is very high (Spearman's $\rho = .80$). This borders on a breach of discriminant validity, suggesting it may be worth testing whether modelling their six indicators as a single construct would significantly impair the model fit (Brown, 2006)¹³. Social Trust obtains the weakest factor correlations, which is to be expected given that this relates to social rather than system integration.

¹³ Modelling the *trust in institutions* and *evaluation of national performance* items on a single factor results in a poorly fitting model: $\chi^2 = 512.857$ (df = 9), RMSEA = .179, CFI = .854, TLI = .757, SRMR = .077. Making the recommended adjustments to the model (permitting a correlation term between 'trust in political parties' and 'trust in politicians', and between 'satisfaction with the government' and 'satisfaction with the economy' did improve upon this initial model. However, the two-factor solution seen in Figure 2.5 still offers a significantly better fit to the data.

Figure 2.5: Measurement model for ESS2



Data sourced from European Social Survey (Round 2, 2004)

Step 2 tested the goodness of fit of a measurement model for all thirteen items. CFA has shown that this model is a good fit to the data, with these items loading on the five latent constructs tested in Step 1. Step 3 involves testing whether this model also fits the data from three subsequent Rounds of the survey. Provided the model fit is acceptable, multi-group CFA will test its measurement invariance over time (Step 4).

2.3.5 Analyses: Phase II

Step 3: Testing the measurement model on data from Rounds 3 – 5

In Step 2, the model for Round 2 (Figure 2.5) established that the basic measurement model is a good enough fit to the data, but an improvement approaching significance can be obtained by including a correlation between the error terms for ‘trust in politicians’ and ‘trust in political parties’. The first step towards testing a multi-group CFA is to test whether the measurement model from Round 2 fits the data from ESS3 – ESS5. Considering the borderline significance of the improvement to model fit obtained by adding this item correlation, it seems advisable to first test the most basic measurement model – Model ESS2A (see Table 2.3 below).

In Rounds 3, 4 and 5, Model ESS2A achieves model fit that is approximately acceptable. The Chi Square values are unacceptably high, but I suspect this is due to the sample sizes since all other model fit statistics indicate a good enough fit to the data – aside from the TLI value for Rounds 3 and 4, which is just under .95 and therefore less than optimal.

Table 2.3: CFA on individual Rounds of the ESS

		χ^2 (Values indicative of a good fit to the data:	df	χ^2 change	RMSEA $\leq .050$	CFI $\geq .95$	TLI $\geq .95$	SRMR $\leq .050$)
ESS2								
A	Initial model	212.981	55		.041	.977	.967	.028
B	As A + trstplt WITH trstprt	141.934	54	71.047 (1 df)	.031	.987	.981	.023
C	As B + TrstLaw BY stfdem	101.645	53	40.289 (1 df)	.023	.993	.989	.020
ESS3								
A	Initial model	325.185	55		.049	.963	.948	.034
B	As A + trstplt WITH trstprt	166.869	54	158.316 (1 df)	.032	.985	.978	.023
C	As B + TrstLaw BY stfdem	134.595	53	32.274 (1 df)	.027	.989	.984	.021
ESS4								
A	Initial model	351.477	55		.050	.959	.942	.034
B	As A + trstplt WITH trstprt	239.293	54	112.184 (1 df)	.040	.975	.963	.029
C	As B + TrstLaw BY stfdem	155.078	53	84.215 (1 df)	.030	.986	.979	.023
D	As B + stfgov WITH stfeco	179.019	53	60.274 (1 df)	.033	.983	.975	.024
ESS5								
A	Initial model	296.291	55		.047	.968	.955	.027
B	As A + trstplt WITH trstprt	215.009	54	81.282 (1df)	.039	.979	.970	.024
C	As B + TrstLaw BY stfdem	156.986	53	58.023 (1 df)	.032	.986	.983	.021
D	As B + stfdem WITH stfeco	171.607	53	43.402 (1 df)	.034	.985	.977	.021

Data source: European Social Survey (2004 – 2010)

The modification indices indicate that, for each Round, permitting the correlation between ‘trust in politicians’ and ‘trust in political parties’ would substantially improve the Chi Square value. In practice, whilst the change in Chi Square is highly significant, the changes in the other model fit statistics indicate a significant improvement across the board only for Round 3. As described earlier, the Chi Square statistic is highly sensitive to sample size, and the marker points for a significant improvement in the other fit statistics are a change greater than .015 in RMSEA and greater than .01 in CFI (Chen, 2007). However, considering that the addition of this parameter results in a significant improvement in CFI across all Rounds, and the improvement in RMSEA is substantial (.01) in two Rounds, it seems worth retaining this adjustment.

The modification indices for Model ESS2B suggest adding a cross-loading from the *trust in the law* construct to ‘satisfaction with democracy’. Although not previously considered, this new parameter may make theoretical sense, given Denters et al.’s (2007) three-factor model of *trust in institutions* and the relevance of the order institutions to maintaining the legitimate functioning of democracy: high-quality institutions are likely to be associated with a well-functioning democracy (Rothstein & Stolle, 2008).

The results of freeing this parameter are given in Table 2.3 above, as Model C for each Round. ‘Satisfaction with democracy’ loads weakly on its new factor, with standardised factor loadings ranging from just .194 (Round 3) to .293 (Round 4).

Despite being low, these cross-loadings are statistically significant and they do result in some improvement to the model fit. As noted in Table 2.3, the improvement to Chi Square ranges from 32 to 84 for just one degree of freedom. Whilst this is indicative of a significant improvement in model fit, examination of the other fit statistics indicates that the only Round in which adding this new parameter may result in a significant improvement to model fit is Round 4, where CFI improves by .011 (although the change in RMSEA is not strong enough to support this). For this reason, the more parsimonious Model B should be preferred for all four Rounds of the ESS.

Further modification indices are suggested for each Round. However, with their expected change in Chi Square being lower than that for the preceding parameter it seems hardly worth testing their effect on the alternative model fit indices: Model B demonstrates sufficiently good fit to the data that it should be tested in MGCFA.

Step 4: Testing the invariance of the measurement model across Rounds 2 – 5

It is clear from the results of Step 3 that the measurement model generated using ESS2 is also a good fit to the data from Rounds 3, 4 and 5. This final step, Step 4, tests whether this measurement model is invariant across Rounds.

The factor loadings noted in the measurement models for Rounds 2 – 5 strongly suggest that this model will achieve metric (and therefore also configural) invariance

(see Figure 2.5 for the model for ESS2, and Appendix 2C for the models for ESS3 – ESS5). I therefore decided to begin by testing whether the data support the requirements of scalar invariance, which requires that the factor structure, factor loadings and item intercepts are invariant across Rounds.

The model fit statistics for Step 4 are presented in Table 2.4 and it is clear that Model B does not demonstrate scalar invariance. However, the unstandardised factor loadings are all strong and significant in each Round, and the correlations between factors are all below 1.0 (Davidov, 2008). The size of the factor loadings indicate that the observed indicator scores are significantly predicted by the mean score of their factor, and the factor correlations are low enough to demonstrate discriminant validity; no two factors are measuring the same latent construct. To identify the cause behind the poor fit for Model B, it is necessary to examine the modification indices.

Immediately apparent are the large expected improvements in Chi Square indicated by permitting the intercept for 'satisfaction with the economy' to vary across Rounds of the ESS. The expected improvement in Chi Square ranges from 329.165 (Round 2) to 491.157 (Round 3). This alteration to the MGCFA model is put to the test in Model B1. The model fit statistics show this model to have adequate fit to the data (see Table 2.4).

Table 2.4: Results of MGCFA on ESS Rounds 2 – 5

		χ^2	df	χ^2 change	RMSEA	CFI	TLI	SRMR
		(Values indicative of a good fit to the data:			$\leq .050$	$\geq .95$	$\geq .95$	$\leq .050$)
B	Scalar invariance	2382.549	264		.064	.927	.914	.058
B1	Partial scalar invariance	1015.211	261	1367.338	.038	.974	.969	.034
D	Two-factor ENP	899.726	242	1482.823 ^a	.037	.977	.971	.032
D1	Two-factor ENP; two-factor QPS	504.681	219	395.045 ^b	.026	.990	.986	.022
D2	Two-factor ENP; TrstLaw BY stfdem	642.929	241	256.797 ^b	.029	.986	.982	.027
D3	Three-factor ENP	538.839	220	360.887 ^b	.027	.989	.984	.025
Testing sub-groups of Rounds for scalar invariance								
X	ESS2 – ESS3: one-factor ENP	346.864	124		.031	.984	.980	.027
X1	ESS2 – ESS3: two-factor ENP	265.890	114	80.794	.027	.989	.985	.024

Data source: European Social Survey (2004 – 2010).

^a versus Model B. ^b versus Model D.

The five-factor model obtained in B1 may be eligible for a report of partial scalar invariance, provided that the non-invariant intercept: (a) is on a factor with at least two items with invariant intercepts, (b) is explainable, and (c) does not have a substantial impact on the value of the factor mean. Model B1 meets criterion (a), as ‘satisfaction with the economy’ is on a factor with two other items and both of these have invariant intercepts. The variance in the intercept for ‘satisfaction with the economy’ is also explainable, satisfying criterion (b), with respondents’ drop in satisfaction with the economy occurring in parallel to the global financial crisis that began between 2006 – 2008 (Rounds 3 and 4 of the ESS). However, this explains the substantive findings – the actual scores – rather than the methodological findings. I discuss this issue further, before broaching criterion (c).

It appears as though, prior to the financial crisis, the three items measuring *evaluation of national performance* were driven by a shared latent construct. However, with the financial crisis, ‘the economy’ became singled-out as an entity in itself (and was publicly identified as a poorly-performing entity). In addition, this change in the state of the economy was attributed to the banking industry, thereby distancing it from evaluations of the government or the functioning of democracy. It therefore makes sense that even though respondents’ satisfaction with the economy changed, their satisfaction with the government and democracy did not. Given that the data modelled here run only until 2012 and the financial crisis is still on-going, not enough time has passed to be able to assess whether the *evaluation of national performance* items will regroup as a cohesive factor. This may happen either if the economy bounces back, or if the government’s response to the crisis

leaves the public feeling sufficiently disillusioned that their levels of satisfaction on the other two measures (the government and democracy) drop.

This account offers a compelling explanation for the non-invariance of the 'satisfaction with the economy' item over time, which bodes well for its continued inclusion in the factor. However, it is yet to be proven that the non-invariant intercept has no substantial impact on the factor mean. An insubstantial impact on the factor mean may arise when the item with the non-invariant intercept is one of many that measure the same underlying attitude, a higher number of observed scores meaning that a change in one score does little to influence the overall mean. Alternatively, the factor mean may retain equilibrium if, for example, while scores at the lower end of the scale drop, those at the higher end rise leaving the mean score relatively unchanged.

In the present scenario, only three items measure the latent attitude and scores on 'satisfaction with the economy' have dropped across the scale. It is therefore likely that the factor mean will be substantially affected by this non-invariant intercept. Comparing the factor means generated by Model B and Model B1 confirms that there is a large difference between them, and that criterion (c) is not met and Model B1 does not meet the criteria for partial scalar invariance. This means that the current configuration of the *evaluation of national performance* factor should not be used to compare mean scores across Rounds of the survey.

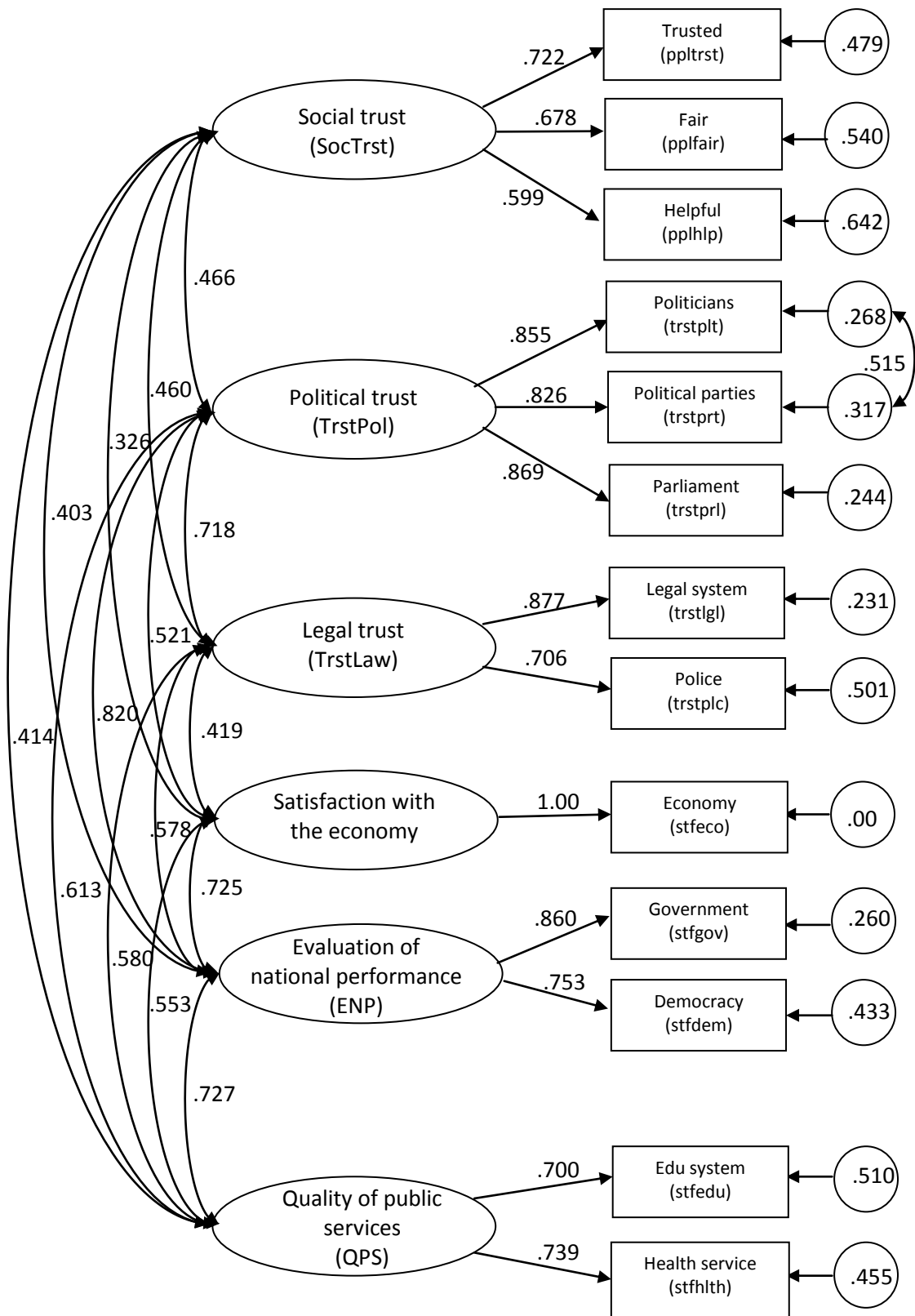
Model D gives the model fit indices for a test of scalar equivalence using a measurement model that includes a two-factor solution for *evaluation of national performance*. As indicated in Table 2.4, this model is a much better fit for the data: RMSEA has improved by .027 and CFI by a massive .05. The factor loadings are still strong and significant, and the correlations between factors are still low enough to demonstrate discriminant validity.

The modification indices do identify a number of areas of possible strain in the model. These vary across Rounds, however, the re-specifications expected to have a more substantial impact on model fit relate to the 'performance' factors *evaluation of national performance*, *perceived quality of public services* and *satisfaction with the economy*. The data suggest that for Rounds 3 and 5, the *perceived quality of public services* factor should be split into two. For Round 4, they recommend cross-loadings be opened between *satisfaction with the economy* and the remaining two indicators of *evaluation of national performance*, in addition to correlations between these items' error terms.

I have undertaken further analyses to test whether these re-specifications would be beneficial. Model D1 investigates the impact on model fit if the two indicators on the *perceived quality of public services* factor are separated to form one *education* factor and one *health* factor: RMSEA improves by .011 and CFI by .013. Whilst this does present a marginally significant improvement in model fit, this is achieved at the expense of 23 degrees of freedom. This change is therefore rejected in favour of maintaining a relatively parsimonious model.

The next modification tested is the cross-loading of 'satisfaction with democracy' on *trust in the law*. Model D2 demonstrates a better fit to the data than Model D, however, the improvements in RMSEA (.008) and CFI (.009) are non-significant. The final model tested, Model D3, breaks the remaining ENP factor into two items – this means that the original three items now each load on their own factor. The model fit is an improvement over the original Model D, however, similarly to Model D1, the improvement in model fit is not sufficient to justify the loss of 22 degrees of freedom.

Figure 2.6: Final measurement model for ESS2 – 5 (Model D, ESS2 coefficients)



Data sourced from European Social Survey (Rounds 2 – 5, 2004 - 2010)

Following the additional tests of modifications to the measurement model, it seems safe to regard Model D – the six-factor model presented in Figure 2.6 – as final. In this model, the primary difference from the original Model B is that the ‘satisfaction with the economy’ item has been split from the *evaluation of national performance* factor¹⁴.

Clearly, the financial crisis has divorced the ‘satisfaction with the economy’ item from ‘satisfaction with the government’ and ‘satisfaction with the functioning of democracy’. This has led to respondents’ scores on this item being driven by actual evaluations of the economy rather than by a more generic underlying level of support for the system.

Research question 3 asks whether the measurement model demonstrates configural, metric or scalar invariance over time. The six-factor measurement model does satisfy the criteria for scalar (and configural) invariance and, on this basis, these data can be subjected to time-series analysis for the comparison of factor means amongst Rounds 2 – 5 of the ESS.

¹⁴ Applied just to ESS2 and ESS3 (before the financial crisis), the five-factor measurement model is well-fitting and fully scalar invariant: $\chi^2 = 346.864$ (df = 124), RMSEA = .031, CFI = .984, TLI = .980, SRMR = .027. Re-specifying this as a six-factor model (as per Model D) does not significantly improve the model fit.

2.4 Conclusions

The six-factor measurement model (Model D) satisfies the requirements of scalar invariance, indicating that not only can the relationships between underlying constructs be compared across time, but so can the mean scores of each construct.

As with any MGCFA model, however, there are certain limitations to the measurement model obtained here which are worth keeping in mind. Naturally, these findings cannot be generalised to items from other datasets (including across other Rounds of the ESS), or to latent constructs that comprise different variables, such as the six items from the European Quality of Life Survey (2007) that Harrison et al. (2011) put forward to measure *perceived quality of public services*.

By nature, these indicators are vulnerable to environmental change and this renders them liable to fluctuations between Rounds. In the present analyses, it appears that a crisis in the global economy has disturbed the status quo within a single factor and it has been necessary to adjust the model to account for this. In future Rounds of the ESS there may be different environmental influences. It is therefore important that anybody undertaking time-series analysis of these data implement their own evaluation of measurement invariance across the specific Rounds and items they intend to use.

Chapter 3

Literature review: Inter-individual variation in generalised trust

3.1 Introduction

“Trust is the chicken soup of social life... Yet, like chicken soup, it appears to work somewhat mysteriously. It might seem that we can only develop trust in people we know. Yet, trust’s benefits come when we put faith in strangers.”

(Uslaner, 2002: 1)

Similarly to Putnam’s (2000) ‘thin trust’, *generalised trust* refers to trust in strangers (the stranger being the generalised ‘other’). There is broad agreement that generalised trust is required for the efficient and effective functioning of society, however, there is little understanding of where this trust comes from and why it differs amongst individuals. Several theories have been put forward in the literature regarding the origins of generalised trust. Some cite the importance of the individual’s social environment and their place within it, others the importance of the community or societal context, and others the relevance of the individual’s personality or moral values.

It appears as though the factors most often discussed in the literature, social participation and social networks, are primarily valued for their contribution to the smooth functioning of society (e.g. Putnam, 2000). Taking account of the proportion

of the population that is involved in such groups and networks may be helpful in explaining the variance in generalised trust between societies, and encouraging their development may result in a higher level of trust overall. However, irrespective of how many such groups or networks are operational within a society there is still inter-individual variance in levels of generalised trust. This variance between individuals has scarcely been investigated in the literature despite the existence of two models (although one more comprehensively argued than the other) that posit the routes via which trust may come about. A handful of studies have tested the extent to which either values (representing Uslaner's [2002] theory of the moral foundations of trust) or personality traits (representing Personality Theory as named by Delhey & Newton, 2003) predict individuals' levels of generalised trust.

This literature review investigates what is already known regarding the individual-level, dispositional characteristics that are associated with generalised trust. In addition, given the importance of the broader society in determining the social normative context in which the individual lives, I also look at literature that discusses the relevance of the characteristics of society. Factors such as the type of political system and the level of corruption therein may encourage, or necessitate the suppression of, particular personal inclinations. In some cases, this social normative influence may be important in determining the relationship between individuals' dispositional attributes and the level of generalised trust they are willing to report or demonstrate. For example, a high level of government corruption may make the population reluctant to trust, so that even those individuals whose traits or values should be suggestive of a trusting disposition may prefer to be cautious.

The aim of this review is to examine the work that has already been done and to identify appropriate avenues for further research into this important but understudied area. I begin now with an overview of generalised trust and its relevance to the functioning of society. I then discuss the two individual-level theories of the aetiology of generalised trust that are the foci of my second and third substantive chapters.

3.1.1 Generalised trust and social capital

According to social capital theory, generalised trust is essential to the wellbeing and cohesion of communities and societies. While particularised trust (trust in known others or in those who are similar to oneself), or Putnam's 'thick trust', is essential for harmonious personal relationships, generalised trust permits the harmonious functioning of the community and society.

Researchers in the social sciences have given much attention to the subject of generalised trust, developing and testing a range of theories about its drivers. Generalised trust has been found to vary not only amongst individuals but also amongst countries, with characteristics of the society and its institutions (for example, the levels of inequality and corruption) being associated with the aggregate level of self-reported generalised trust.

“Whereas physical capital refers to physical objects and human capital refers to properties of individuals, social capital refers to connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them.”

(Putnam, 2000: 19)

Two forms of social capital are discussed in the literature, ‘bonding’ capital and ‘bridging’ capital:

“Bonding social capital constitutes a kind of sociological superglue, whereas bridging social capital provides a sociological WD-40.”

(Putnam, 2000: 23)

Generalised trust promotes bridging capital, which facilitates and nurtures cooperation between social groups (groups characterised, for example, by religion, class, age or occupation) and thereby reduces social tensions (Davies, Wilkins, Harrison, Sibley, & Owen, 2011). Bonding capital is more the domain of particularised trusters: while trusting only those who are similar to ourselves – whether that’s with respect to social class, religion or any other attribute – may mean that we still have a strong support network, it is more likely to promote intergroup tension than cohesion, branding-by-implication the out-groups as untrustworthy (Putnam, 2000).

While the amount of social support available to the individual and their degree of integration into society (the individual's own level of social capital) is important, a focus solely on the welfare of the individual does not achieve harmony within society. For this harmony to develop, between social groups and between the echelons of the various institutions and organisations within society, we need bridging capital and we need generalised trust.

In the next section, I discuss the measurement of and empirical associations demonstrated by self-reported generalised trust. In Section 3.1.3.1, I discuss the measurement of behavioural trust and trustworthiness, and their prevalence in experimental studies.

3.1.2 Self-reported generalised trust

3.1.2.1 Measuring self-reported trust

Although survey measures of trust vary widely, self-reported generalised trust is often measured using a variant of the generalised trust question (GTQ). The GTQ, which has been fielded in a range of national and cross-national surveys as well as in smaller-scale studies, asks: "In general, would you say that most people can be trusted or that you can't be too careful in dealing with people?". The response set varies between instruments, with many offering a dichotomous response option: "you can't be too careful" versus "most people can be trusted". Other instruments

offer more response options, with the broadest being an eleven-point scale, as fielded in the European Social Survey, which runs from 0 to 10: 0 represents “you can’t be too careful” and 10 represents “most people can be trusted”.

Generalised trust is sometimes represented by the three-item ‘social trust scale’. In addition to the GTQ, the social trust scale presents two other items from Rosenberg’s (1957) Misanthropy Scale. One item asks the respondent to evaluate the helpfulness of other people (“Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?”) and the other asks them to evaluate others’ fairness (“Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?”; the response sets for these items are equivalent in wording and scale to those for the GTQ).

There is some debate in the literature regarding whether the social trust scale or the GTQ alone offers the most appropriate measure of generalised trust. Below, I review some of the literature on this issue and seek to reach a defensible conclusion.

Measuring trust: one item or three?

As discussed in Chapter 2, factor analysis of the three ‘social trust’ items returns a robust single factor. However, there is some debate regarding whether, independently, they all measure the same thing. My discussion here draws on

representations of these items' trajectories over time as well as data obtained via cognitive interviewing.

Using data from the General Social Survey (GSS), fielded in the USA between 1972 – 1993, Yamagishi, Kikuchi, and Kosugi (1999) plot the trajectories of the proportion of respondents who said that 'most people can be trusted' and the proportion who said that 'most people would try to be helpful'. Using data from selected years (skipping 1974, 1977, 1979, 1981, 1982, 1985 and 1992), it appears as though the two items alternate between coalescing and deviating (see Appendix 3A.1). In addition, it appears as though while the proportion who say 'most people can be trusted' demonstrates an overall downward trend, the trend for those who say that 'most people would try to be helpful' appears positive. The implication is that these two measures report meaningfully different trajectories, however, it is worth noting that between 1973 and 1987 the chart for both measures resembles a set of gnashing teeth; each mean score rises or falls by up to 15% over the space of one or two years. It is therefore difficult to know whether any apparent differences are meaningful.

Rahn and Transue (1998) offer a more straightforward chart of the trajectories for the three items in the social trust scale, again using data from the GSS (see Appendix 3A.2). However, they included in their data those respondents who answered "undecided", as if it were the mid-point on a three-point scale. This figure gives the appearance of charting a gradual decline in positive evaluations regarding trust, helpfulness and fairness, but it is uninformative due to the lack of acknowledgement

that ‘undecided’ is not an evaluation but rather the absence thereof; these items may chart a rise in indecision or apathy rather than a decline in trust.

The evidence so far is hardly compelling. Taking a different approach, Uslaner (2002) discusses the results of a ‘think aloud’ study into how respondents decided their answers to the three social trust questions in the American National Election Study (ANES; study implemented in the year 2000). The thoughts shared by respondents regarding their decision-making were categorised as either ‘general’ or ‘experience’. ‘General’ would indicate that the answer given reflected a worldview (for example, “Still an optimist about people and you try to trust people first”; Uslaner, 2002: 73), while a comment categorised as ‘experience’ would indicate that the respondent reflected on past experience (e.g. “[For the] most part people try to be helpful, thinking of people in general, thinking of people opening doors for you if your hands are full...”; Uslaner, 2002: 73). Those who declined to give an explanation were classified as ‘no content’.

Ideally, if these questions all measure generalised trust, we would hope the respondents were responding from ‘general’ viewpoints on all three items. However, the degree to which this occurred varied. Of those who gave a ‘think aloud’ explanation, 72% responded to the GTQ from a ‘general’ perspective (with the remaining 28% responding based on experience), while 56% responded to the ‘fairness’ item from a ‘general’ viewpoint and 39% to the ‘helpfulness’ question (Uslaner, 2002). Across the whole sample (i.e. including those who did not give a ‘think aloud’ response), the proportion of responses driven by a ‘general’ worldview

was highest for the GTQ (58%), reducing slightly for the item measuring evaluations of others' fairness (44%) and further still for evaluations of others' helpfulness (29%).

It is possible that individuals' overall thought processes inform their inclinations regarding generalised trust. However, the 'think aloud' responses given regarding the three social trust questions suggest that responses to these items may be driven by different factors. The point of *generalised* trust is that it operates heuristically or instinctively and does not require a great deal of thought before answering. A prudent way forward in the investigation of specifically *generalised* trust therefore appears to be to use the GTQ in isolation from the other two questions.

In the sections that follow, I give an overview of the characteristics associated with self-reported generalised trust before discussing the behavioural measures of trust (and trustworthiness). I then move on to discuss the theories regarding the origins of generalised trust, focussing on those operating at the individual-level and the level of society.

3.1.2.2 Self-reported trust: associations with other variables

Association with variables measured at the micro-level

In regression analyses, self-reported generalised trust tends to be associated with a range of socio-demographic variables including age, gender and education (e.g. Freitag, 2003; Freitag & Bühlmann, 2009; Paxton, 2007). While trust is consistently positively associated with a higher level of education (Albanese et al., 2013; Fehr, 2008; Naef & Schupp, 2009b), the results for gender and age are mixed: some studies cite higher trust scores amongst males (Naef & Schupp, 2009) and others amongst females (Albanese et al., 2013; Dohmen et al., 2008), and while some studies find that self-reported trust increases with age (Albanese et al., 2013; Dohmen et al., 2008) others report the opposite (Naef & Schupp, 2009).

The significant associations between trust and socio-demographic attributes hold in multi-level models that also account for variables at the level of society (e.g. Gundelach, 2014; Herreros, 2012; C.-S. Lee, 2013; Olivera, 2013; Park & Subramanian, 2012; Polillo, 2012; Reeskens, 2009; Robbins, 2011; Wang & Gordon, 2011; You, 2012). In addition, socioeconomic indicators such as occupational prestige, household income and the degree of comfort living on that income have been found to be positively associated with generalised trust: a more prestigious occupation, a higher income or level of financial comfort are associated with a higher level of generalised trust (Paxton, 2007; Naef & Schupp, 2009).

Association with variables measured at the macro-level

Although generalised trust is measured at the level of the individual, much work has investigated the associations between characteristics of the country or society and aggregate generalised trust (that is, the mean level of generalised trust reported across the population sample). Generalised trust is usually found to be higher in democratic countries (Uslaner, 2002), those that have a universalistic welfare state (Rothstein & Stolle, 2002), a lower level of income inequality (Knack & Keefer, 1997), higher national wealth (Uslaner, 2002) and a lower level of corruption (Uslaner, 2002). There are mixed findings regarding the relevance of ethnic homogeneity (Dinesen & Sønderskov, 2013; Paxton, 2007; You, 2012).

3.1.3 Behavioural trust (and trustworthiness)

3.1.3.1 Measuring behavioural trust (and trustworthiness)

Although these theories are about trust, this review also considers trustworthiness. With findings from some studies indicating that scores on self-reported measures of trust relate more strongly to behavioural trustworthiness than to behavioural trust, there is some uncertainty around quite what these measures are capturing (e.g. Glaeser, Laibson, Scheinkman, & Soutter, 2000). Behaviour in the 'trust game' is commonly taken as behavioural measures of generalised trust and trustworthiness.

In the standard trust game, there are two players – a Sender and a Returner. In some versions of the game both players begin with a sum of money, often around £10 (or \$10 or €10), while in others only the Sender starts the game with such an endowment and the Returner starts the game with zero. The Sender is asked to decide how much money to transfer to the Returner. Typically they are permitted to send any sum from their £10, while in other versions of the game they are restricted – often to sending either all of the £10 or sending £0. Any amount of money they transfer to their game partner is multiplied (usually tripled) by the researchers. The Returner then holds this sum of money and is free to choose how much money to transfer back to the Sender. Again, in some games this amount may be entirely open, while in others it is restricted: often the Returner may transfer either an amount slightly higher than the ‘split equally’ amount, or an amount slightly lower. In most cases, the participants in the trust game are unaware of who their game partner is.

The amount transferred by the Sender is taken as an indication of their degree of generalised trust (generalised because their game partner is unknown to them). The amount transferred by the Returner is taken as a measure of their trustworthiness. Experiments involving the trust game are often implemented alongside a questionnaire that measures personal attributes or psychological constructs that are expected to be relevant to the participant’s decisions.

3.1.3.2 Behavioural trust and trustworthiness: prevalence in experimental studies

In the standard, open-transfer version of the trust game, participants are able to send or return as much money as they like rather than choosing between two prescribed alternatives. The amount transferred by the Sender varies widely between studies: in their meta-analysis, Johnson and Mislin (2011) find that although on average Senders transfer around 50% of their initial stake to the Returner, this figure varies between 22% and 89%. In versions where the permitted transfer amounts are restricted, Senders may be able to invest either all or none of their endowment. This experimental design has been found to result in an investment rate of approximately 40% (Ermisch, Gambetta, Laurie, Siedler, & Noah Uhrig, 2009). In their meta-analysis, Johnson and Mislin (2011) report that the degree of trust shown by Senders varies with age, such that older Senders are less trusting than those who are younger, and there may also be cross-cultural variation. In addition, Naef and Schupp (2009) report that students show more trust than non-students,

In the standard trust game (where players can transfer any amount), Returners transfer on average around 37% of the available money to the Sender, but this amount also varies widely between studies (between 11% and 89%; Johnson & Mislin, 2011). In the two main binary designs of the game, the Returner may be asked to choose between transferring zero or just over half of the money held to the Sender, or between sending just under or just over half. Ermisch et al. (2009) report

that in the former circumstances approximately 50% of Returners are trustworthy, the remaining 50% electing to keep the entire sum.

Johnson and Mislin (2011) report that trustworthiness in the standard, open-transfer version of the trust game has been found to vary with age (such that older transfer more money back to the Sender) and that students tend to be less trustworthy than non-students. Müller and Schwieren (2012) report that the primary predictor of the sum returned to the Sender is the amount of money the Sender invested with the Returner in the first place. In the section that follows, I consider the appropriateness of using the trust game as a behavioural measure of generalised trust.

3.1.3.3 Self-reported trust and behaviour in the trust game

In an effort to capture a behavioural measure of generalised trust, some researchers have turned to the trust game. In this section I discuss whether we should expect behaviour in the trust game to reflect the individual's self-reported level of generalised trust.

Self-reported trust and behavioural trust

Studies in the available literature report conflicting findings regarding the associations between self-reported and behavioural trust, with some observing an

association (e.g. Fehr, Fischbacher, Von Rosenbladt, Schupp, & Wagner, 2003) and others reporting no significant relationship (e.g. Holm & Nystedt, 2008; Naef & Schupp, 2009b).

It is worth bearing in mind that the generalised trust question (GTQ) is generic and context-free, while the trust game measures trust in a rather specific context: when playing the trust game, individuals are likely to be mindful of a different set of concerns and rely on different heuristics than when answering survey questions about trust. In addition, while the trust game is played anonymously there is no mention of anonymity in the GTQ (Sapienza, Toldra-Simats, & Zingales, 2013); it is therefore possible that respondents to the latter are mindful of their past success rate in determining who is and is not trustworthy. Despite this, Holm and Nystedt (2008) did find a correlation between self-reported trust and behavioural trust when there was no monetary incentive – i.e. the trust game was played hypothetically.

Self-reported trust and behavioural trustworthiness

As noted by Glaeser et al. (2000), there is some evidence that self-reported generalised trust may correlate more strongly with behavioural trustworthiness than with behavioural trust (see also Ermisch et al., 2009 and Lazzarini, Madalozzo, Artes & Siqueira, 2005; although see Fehr et al., 2003).

An association between self-reported trust and trustworthiness makes some sense theoretically. As pointed out by Evans and Revelle (2008), it is possible that the Returner who is high in generalised trust will be more likely to view the Sender as a game partner than as an opponent and this may make them more inclined to work with them cooperatively. In addition, it is possible that our expectation of others' degree of trustworthiness is at least partly driven by our own trustworthiness (the 'false consensus effect' as noted by, for example, Butler, Giuliano & Guiso [2012]; see Orbell and Dawes [1991] for a discussion of this theory).

Summary

There appears to be little theoretical (or empirical) support for the expectation that self-reported trust will correspond to behavioural trust as measured by the trust game. In the section that follows, I describe the theories that posit the drivers of generalised trust.

3.2 Theoretical accounts of the origins of generalised trust

There are several theories of the origins of generalised trust. Some regard the propensity to trust as a characteristic that is inherent to the individual and predominantly determined by attributes such as personality traits (Personality Theory; Delhey & Newton, 2003) or values (Moral Foundations of Trust Theory;

Uslaner, 2002). Others emphasise the importance of the individual's standing (Success and Wellbeing Theory; Delhey & Newton, 2003) and participation in their social environment (Voluntary Organisations Theory centres on formal participation, while Social Networks Theory focuses on the myriad informal groups that form amongst friends and associates; Putnam, 2000).

The final set of theories note the importance of the broader context in which the individual lives: Community Theory and Societal Theory (Delhey & Newton, 2003) cite, respectively, the impact that characteristics of the local area and the broader society have upon individuals' levels of generalised trust. These bear strong resemblance to *institutional theory*, which posits that generalised trust is associated with the behaviour of local and national institutions both directly (effective order institutions serving to deter untrustworthy behaviour) and indirectly (cooperative, non-corrupt institutions serving as role models to members of the public; Rothstein & Stolle, 2008).

The socially-oriented theories have received a great deal of attention but mixed reviews in the empirical literature (e.g. Sturgis, Patulny, & Allum, 2009; Sturgis, Patulny, Allum, & Buscha, 2012) and authors often cite the likelihood of self-selection into membership of such groups; people who are keen to participate may be more well-disposed towards others in the first place (e.g. Uslaner, 2002). The existing literature demonstrates that individuals' dispositional characteristics – such as their traits and values – are associated with such variables as their social behaviour (Caprara, Alessandri, & Eisenberg, 2012; Pollet, Roberts, & Dunbar, 2015),

career success (Judge, Higgins, Thoresen, & Barrick, 1999) and self-reported wellbeing (e.g. Boyce, Wood, & Powdthavee, 2013; Steel, Schmidt, & Shultz, 2008). It therefore seems reasonable to suspect that these individual-level factors may contribute to determining both one's inclination to participate in formal and informal social groups, and one's proclivity for trust versus caution.

Below, I briefly discuss the distinction between personality and values, before discussing these theories in turn and the findings from studies that have tested them. I then turn to look at Societal Theory (or Institutional Theory), and discuss the potential influences of society-level characteristics on generalised trust and any studies that have investigated this.

3.2.1 Individual-level theories: the relevance of personality and values

The two individual-level theories cite values and personality as the driving forces behind generalised trust. Before exploring each of these theories I would first like to discuss the defining characteristics of traits versus values. Although undeniably connected (see Appendix 3B for McCrae and Costa's [1996] model of the theoretical association between traits and values, and Parks-Leduc, Feldman & Bardi [2014] for a meta-analysis of the empirical associations between them), a clear distinction can be drawn – at least in theoretical terms – between the two sets of constructs.

“Traits describe “what people are like” rather than the intentions behind their behavior. Values refer to “what people consider important,” the goals they wish to pursue.”

(Roccas, Sagiv, Schwartz, & Knafo, 2002: 790)

Olver and Mooradian (2003) discuss values as generally stable but malleable constructs, which are determined not only by one’s personality but also by environmental influences such as perceived social norms, life experience and interactions with other people. Roccas et al. (2002) distinguish values by highlighting their evaluative quality in comparison to the descriptive nature of traits. A single attribute can be a trait or a value; as a trait it would describe an attribute of the person, but as a value something to aspire to but not necessarily embody.

“Values refer to “what people consider important,” the goals they wish to pursue... values vary in their importance as guiding principles (ranging from at least minimally to supremely important). People believe their values are desirable, at least to a significant reference group, whereas traits may be positive or negative.”

(Roccas et al., 2002: 790)

A person’s values tell us what they think is important, and values are chosen under social and cultural influence. The bearer of a particular value holds it in high regard and expects certain people amongst a salient in-group to do likewise. Although there is some debate in the literature around the definition of values (for example, whether they relate to behaviour or to goals; De Raad & van Oudenhoven, 2008), all appear to note this normative component: values are socially meaningful

preferences that have implications for the way we live our lives. Traits, on the other hand, are involuntary predispositions – our internal programming that influences our perceptions and responses.

Below I discuss the two individual-level theories (Personality Theory and the theory of the moral foundations of trust) in turn, considering the theoretical argument for their relationship with generalised trust, the measurement of their posited predictor variables (i.e. personality and values, respectively) and any empirical findings to date.

3.2.2 Personality Theory

Personality Theory declares that the individual's propensity for generalised trust is not only determined by, but is part of, their underlying character. This fits with McCrae and Costa's (1999) Big Five model of personality traits, in which *trust* is identified as a facet within Agreeableness. Delhey and Newton (2003) posit optimism and the feeling of being in control of one's own life, to be appropriate proxy measures for personality, and that both should be associated with a high propensity for generalised trust (Delhey and Newton, 2003; Uslaner, 2002). In contrast, a low level of generalised trust is likely to be associated with a generally 'misanthropic' perspective (Delhey & Newton, 2003: 95). Consistent with the common definition of personality traits, according to Personality Theory one's level

of generalised trust is a relatively stable characteristic although it may change in response to life events (Delhey and Newton, 2003).

Using a range of measures, personality has been found to have associations with occupational success (Gelissen & de Graaf, 2006), self-reported prosocial behaviour (Caprara et al., 2012), happiness (Steel et al., 2008), life satisfaction (Steel et al., 2008; Boyce et al., 2013), career success (Judge et al., 1999) and the size of one's social network (Pollet et al., 2015; though this may only be apparent in homogenous samples – see Roberts, Wilson, Fedurek & Dunbar, 2008).

3.2.2.1 Conceptualising and measuring personality

Theories of the origins and structure of personality abound: the psychodynamic approach (with proponents such as Freud, Jung and Adler) concentrates on the relevance of the unconscious, the humanistic approach (e.g. Rogers and Maslow) highlights the person's potential for positive change and growth, while the trait perspective (Allport, Catell, Eysenck and the Big Five) focuses on personality as something that we can observe and measure (Ewen, 2010). Ewen advises that while the psychodynamic and humanistic perspectives originate in clinical contexts, the trait perspective is oriented towards research uses. Interested in measuring the relationship between trust and personality in a non-clinical population, it is the trait approach that I focus on here.

“Allport defined a trait or disposition as ‘a generalised neuropsychic structure (peculiar to the individual), with the capacity to render many stimuli functionally equivalent, and to initiate and guide consistent (equivalent) forms of adaptive and stylistic behaviour’”

(Boyle, Matthews, & Saklofske, 2008: 2)

The trait models subscribe to the idea that personality is a set of interpretive filters that can influence the way we perceive ourselves and everything around us. They can affect our feelings, thoughts, motivations and of course our behaviour (Boyle et al., 2008). While it is now widely recognised that our personality is driven in part by genetic inheritance and by the social environment, empirical associations have been observed between the individual’s personality traits and their biochemistry and neurological structures (Canli, 2006; Stelmack & Rammsayer, 2008).

A number of models have been developed within the trait approach (see Table 3.1 for a selection of these)¹⁵. While the original models tend to comprise many items, permitting the measurement of personality ‘facets’ in addition to ‘traits’, some short forms have been developed. Although the short versions of these inventories do not retain the detail of the long versions, they do scale well with them as measures of the Big Five traits. Comprising as few as fifteen items, they can permit investigation of personality in large, representative population samples. To date, few surveys have tested personality using validated indicators, but The German Socio-economic Panel (GSOEP) and the UK’s British Household Panel Survey (BHPS) and Understanding Society have each fielded the fifteen-item version of the Big Five Inventory (BFI-S;

¹⁵ For a detailed discussion of each model, see Boyle et al. (2008).

Gerlitz & Schupp, 2005). In Section 3.2.2.2 I discuss the findings from studies that have tested personality theory using data from these surveys, while in 3.2.2.3 I look at studies that have done so in experimental contexts.

Table 3.1: Trait models of personality – their name, structure and their theorised dimensions and facets

Name	Structure	Personality dimensions and facets
California Personality Instrument ^a	Four clusters comprising twenty 'scales' (facets of personality), measured by 434 items.	<p>Cluster I – Interpersonal style and orientation: <i>dominance, capability for status, sociability, social presence, self-acceptance, independence, empathy</i></p> <p>Cluster II – Normative orientation and values: <i>responsibility, socialisation, self control, good impression, communality, wellbeing, tolerance</i></p> <p>Cluster III – Cognitive and intellectual functioning: <i>achievement via conformance, achievement via independence, intellectual efficiency</i></p> <p>Cluster IV – Role and personal style: <i>psychological mindedness, flexibility, femininity/masculinity</i></p>
Comrey Personality Scales ^b	Eight dimensions comprising forty 'facets', measured by 180 items.	<p>Trust vs. Defensiveness (T): <i>lack of cynicism, lack of defensiveness, belief in human worth, trust in human nature, lack of paranoia</i></p> <p>Orderliness vs. Lack of Compulsion (O): <i>neatness, routine, order, cautiousness, meticulousness</i></p> <p>Social Conformity vs. Rebelliousness (C): <i>law enforcement, acceptance of social order, intolerance of nonconformity, respect for law, need for approval</i></p> <p>Activity vs. Lack of Energy (A): <i>exercise, energy, need to excel, liking for work, stamina</i></p> <p>Emotional Stability vs. Neuroticism (S): <i>lack of inferiority feelings, lack of depression, lack of agitation, lack of pessimism, mood stability</i></p> <p>Extraversion vs. Introversion (E): <i>lack of reserve, lack of seclusiveness, no loss for words, lack of shyness, no stage fright</i></p> <p>Mental Toughness vs. Sensitivity (M): <i>no fear of bugs, no crying, no romantic love, tolerance of blood, tolerance of vulgarity</i></p> <p>Empathy vs. Egocentrism (P): <i>sympathy, helpfulness, service, generosity, unselfishness</i></p>

Name	Structure	Personality dimensions and facets
Sixteen Personality Factor Questionnaire ^c	Five global, comprising fifteen primary factors (six featuring twice in different global factors), measured by 185 items in the fifth edition.	<p>Extraversion/ Introversion: <i>warm – reserved, lively – serious, bold – shy, private – forthright, self-reliant – group-oriented</i></p> <p>High Anxiety/ Low Anxiety: <i>emotionally stable – reactive, vigilant – trusting, apprehensive – self-assured, tense – relaxed</i></p> <p>Tough-mindedness/ Receptivity: <i>warm – reserved, sensitive – unsentimental, abstracted – practical, open-to-change – traditional</i></p> <p>Independence/Accommodation: <i>dominant – deferential, bold – shy, vigilant – trusting, open-to-change – traditional</i></p> <p>Self-control/ Lack of Restraint: <i>lively – serious, rule-conscious – expedient, abstracted – practical, perfectionistic – tolerates disorder</i></p>
NEO Personality Inventory ^d	Five traits, comprising 36 facets measured by 240 items	<p>Neuroticism: <i>anxiety, angry hostility, depression, self-consciousness, impulsiveness, vulnerability</i></p> <p>Extraversion: <i>warmth, gregariousness, assertiveness, activity, excitement seeking, positive emotions</i></p> <p>Openness: <i>fantasy, aesthetics, feelings, actions, ideas, values</i></p> <p>Agreeableness: <i>trust, straightforwardness, altruism, compliance, modesty, tender mindedness</i></p> <p>Conscientiousness: <i>competence, order, dutifulness, achievement striving, self-discipline, deliberation</i></p>

Name	Structure	Personality dimensions and facets
Eysenck Personality Profiler ^e	Three personality dimensions, comprising 21 traits, measured by 440 items	<p>Extraversion: <i>activity, sociability, expressiveness, assertiveness, ambition, dogmatism, aggressiveness</i></p> <p>Neuroticism: <i>inferiority, unhappiness, anxiety, dependence, hypochondria, guilt, obsessiveness</i></p> <p>Psychoticism: <i>risk-taking, impulsivity, irresponsibility, manipulativeness, sensation seeking, tough-mindedness, practicality</i></p>
HEXACO ^f	Six dimensions, comprising 24 'facets' and measured by 100 items	<p>Honesty-humility: <i>sincerity, fairness, greed-avoidance, modesty</i></p> <p>Agreeableness (versus anger): <i>forgiveness, gentleness, flexibility, patience</i></p> <p>Emotionality: <i>fearfulness, anxiety, dependence, sentimentality</i></p> <p>Extraversion: <i>social self-esteem, social boldness, sociability, liveliness</i></p> <p>Conscientiousness: <i>organisation, diligence, perfectionism, prudence</i></p> <p>Openness to Experience: <i>aesthetic appreciation, inquisitiveness, creativity, unconventionality</i></p>

Sources: ^a Boer, Starkey & Hodgetts, 2008; ^b Comrey, 2008; ^c Cattell & Mead, 2008; ^d McCrae & Costa, 1999; ^e Furnham, Eysenck & Saklofske, 2008; ^f Lee & Ashton, 2004.

3.2.2.2 Testing Personality Theory: predicting self-reported generalised trust

In this section and the section that follows, I report the findings from studies that have sought to predict self-reported and behavioural trust using personality traits. In Section 3.2.2.4 I describe my concerns regarding these studies, as well as the use of proxy measures in place of a recognised measure of personality.

The development of brief trait inventories, and their inclusion in nationally representative surveys, has facilitated more thorough tests of the association between personality and generalised trust. Becker, Deckers, Dohmen, Falk, and Kosse (2012) undertake analyses on data from the German Socioeconomic Panel (GSOEP) survey. The GSOEP has fielded measures of personality traits (the fifteen-item Big Five Inventory; BFI-S) as well as generalised trust.¹⁶ The authors report significant correlations between personality traits and generalised trust, with the strongest association for Neuroticism ($r = -.192$) followed by Openness ($r = .128$), Agreeableness ($r = .095$), Conscientiousness ($r = -.068$) and Extraversion ($r = .058$; for all, $p < .01$). However, the coefficients for Conscientiousness and Extraversion do seem rather small; it is possible that the statistical significance of these relationships is driven by the large sample size.

¹⁶¹⁶ The GSOEP measures generalised trust using three items, each measured on a four-point scale (totally agree, agree slightly, disagree slightly and totally disagree): “On the whole, one can trust people”, “Nowadays one can’t rely on anyone” and “If one is dealing with strangers, it is better to be careful before one can trust them” (GSOEP, 2003, 2008).

Again using the GSOEP, Dohmen et al. (2008) use OLS regression analysis to determine the effects of traits on trust. They too use the BFI-S measure of traits and the same measures of trust (although Dohmen and colleagues omit the neutral mid-point of the scale for the trust measures). In a model that accounts for age, gender and height, the authors report significant effects for four of the five traits: Neuroticism (-.148), Openness (.109), Conscientiousness (-.083) and Agreeableness (.079; all $p < .01$).

Albanese et al. (2013) report findings from another model based on GSOEP data. This time trust, measured by the three standard items, is predicted by impatience (-.055, $p < .01$), risk aversion (-.075, $p < .01$), age (.001, $p < .05$), gender (being female; .103, $p < .01$), education (.078, $p < .01$), negative reciprocity (which the authors cite as betrayal aversion; -.088, $p < .01$), positive reciprocity (.016, *ns*) and altruism (.056, $p < .01$), in addition to the Big Five traits: Openness (.020, $p < .05$), Conscientiousness (-.100, $p < .01$), Extraversion (.008, *ns*), Agreeableness (.015, *ns*) and Neuroticism (-.116, $p < .01$). Albanese and colleagues also produce a model that includes measures of locus of control (.056, $p < .01$) and optimism (.098, $p < .01$) alongside the Big Five traits. However, as will be discussed later, the inclusion of optimism is likely to distort the effect of Neuroticism (which is reported to be associated with heightened sensitivity to negative feelings and expectations; e.g. Simon et al., 2010). The presence of optimism and locus of control in the latter model did reduce the coefficient for Neuroticism by some margin (-.079, $p < .01$), although it remained significant.

3.2.2.3 Testing Personality Theory: predicting behavioural trust and trustworthiness

In correlation analysis of behavioural data, Becker et al. (2012) report that their experimental dataset generated significant, positive associations for Openness (.123) and Agreeableness (.167), a significant negative association for Conscientiousness (-.130; for all $p < .01$) and non-significant associations for Extraversion and Neuroticism. In their experimental dataset, traits were measured using either the BFI-S (Gerlitz & Schupp, 2005) or the sixty-item NEO-FFI (McCrae & Costa, 2010).

Müller and Schwieren (2012) ask whether personality can predict behaviour in economic games. While the reason for an association between personality and small-scale economic behaviour may not be immediately apparent, behaviour in the trust game is likely to be socially driven. Games such as the trust game, or the dictator or ultimatum games, involve negotiating a complex social environment in which participants' behaviour is likely to be influenced by all salient predispositions, including personality traits.

In an experiment with 138 participants in Germany, Müller and Schwieren (2012) implemented a version of the trust game in which both players were given ten 'experimental currency units' (ECU10, worth approximately €3.33) at the start. The Sender could choose to transfer any portion of this ECU10 to the Returner. Any units transferred were tripled, and the Returner could then transfer any amount from

their new total endowment back to the Sender. Participants completed a questionnaire that included the 240-item NEO-PI-R questionnaire (McCrae & Costa, 2010).

The authors report that in correlation analyses Neuroticism ($-.339, p < .01$) and Agreeableness ($.284, p < .05$) were significantly associated with the amount of money transferred by the Sender, with a trend towards significance for Conscientiousness ($-.258, p < .1$)¹⁷. These findings were maintained in regression analysis, with coefficients indicating that Neuroticism ($-.400, p < .01$) is the most important in driving trust (or rather, with these two negative coefficients, a lack of trust), followed by Conscientiousness ($-.353, p < .01$) and finally Agreeableness ($.246, p < .05$; the model also included age and gender, which were both non-significant).

Investigating the association between Sender behaviour and the facets within the three significantly predictive traits, Müller and Schwieren (2012) report that several facets demonstrate significant correlations: *anxiety*, *angry hostility* and *depression* within Neuroticism (all negatively associated with the amount sent), *trust* and *straightforwardness* within Agreeableness (both positively associated), and *order* and *deliberation* within Conscientiousness – with a trend towards significance for *achievement striving* (all negatively associated). However, in regression analysis that also accounts for age and gender, none of these significantly predict behaviour (in a

¹⁷ Müller and Schwieren (2012) identify Conscientiousness as being significantly correlated with the Sender's decision, however, this is significant at the level of $p < .1$; in this study I use the 5% cut-off value.

model that excludes demographic variables, *anxiety*, *trust* and *order* remain significant).

Müller and Schwieren (2012) elected to only investigate facet-level associations within traits that showed a significant association with behaviour. The rationale behind this decision is not clear and appears to restrict the efficacy of their investigation. Similarly, given that personality varies between the genders and across the life course, it is likely that the inclusion of these variables in their models detracted from the observed relationship between personality and trust.

In the section below, I describe why further research into Personality Theory would be of value to the field.

3.2.2.4 Testing Personality Theory: why is further investigation needed?

Clearly, Personality Theory has been tested and has not been completely ignored. However, the manner in which it has been tested has not necessarily given personality the best opportunity to reveal its full associations with self-reported trust and with behavioural trust and trustworthiness. Two key issues stand out to me that indicate the literature would benefit from further investigation of this theory: the representation of personality using two or three proxy indicators, and the almost exclusive use of brief personality inventories.

While the social and societal theories are represented by measures that at least have strong face validity (see Delhey & Newton, 2003), Personality Theory is represented by either (a) broad measures such as optimism for one's future and the degree of feeling of control over one's life (Delhey & Newton, 2003), or (b) brief trait inventories, the content of which may vary considerably between instruments.

Although respondents' scores on the broad measures of optimism and feeling of control over one's life may to some extent be indicative of an aspect of the individual's disposition, it is not necessarily the case that they represent personality. Responses to both measures may be strongly influenced by material resources or a realistic evaluation of one's circumstances and potential for positive change. This is obviously different to the definition of personality given earlier. In addition, as discussed below, there is some evidence that optimism specifically about one's future may be unrelated to the trait most likely to be associated with generalised trust.

Representing personality: the right type of optimism?

Sharpe, Martin, and Roth (2011) investigated the statistical relationships between optimism and the Big Five traits. Using five samples, predominantly of undergraduate and graduate students, measures of optimism were variably obtained in different samples using the *Life Orientation Test* (LOT), the *Worldview Personality Optimism-Pessimism Scale* (WVPI-OP) and the *International Personality*

Item Pool Optimism Scale (IPIP-OP). Personality traits were (variably) measured using the *Revised NEO Personality Inventory* (NEO-PI-R), the *NEO Five-Factor Inventory* (NEO-FFI), the *Big-Five Factor Markers* (BFM), the *Ten Item Personality Inventory* (TIPI) and the *International Personality Item Pool Big Five Domain Scales* (IPIP-BFD).

In correlation analyses, Sharpe et al. (2011) found optimism to be positively associated with Extraversion, Agreeableness and Conscientiousness and negatively associated with Neuroticism. The strongest relationships with optimism were observed for Extraversion and Neuroticism, except for the WVPI-OP scale in one sample, for which BFM-Agreeableness demonstrated the second-strongest association (second to NEO-Extraversion). In hierarchical regression analysis, with Neuroticism and Extraversion entered in the first step and the remaining three traits in the second, the majority of the variance accounted for in the full model had already been explained in step 1, although step 2 did offer significant increases to the proportion of variance explained. This supports previous research cited by the authors, which reports that optimism is most often positively associated with Extraversion and negatively associated with Neuroticism (see Sharpe et al. [2011] for a review). Again, the exception for Sharpe and colleagues was for the sample that measured personality traits using the NEO and the BFM, for which BFM-Agreeableness proved to be the strongest predictor of optimism.

“... the optimist tends to have a basic personality profile marked by high Emotional Stability, Extraversion, Agreeableness, and Conscientiousness. This personality profile leads to the development of optimistic beliefs and, thus, an overall positive worldview...”

(Sharpe et al., 2011: 950)

The rationale for using optimism as a proxy measure for personality is clear: it is strongly and consistently associated with personality traits (Sharpe et al., 2011). However, Sharpe and colleagues further interrogate their findings to identify where the predictors of the different measures of optimism deviate. In one sample, optimism was measured using both the LOT and the WVPI-OP. The authors point out that, while both scales are significantly associated with Neuroticism and Extraversion, the WVPI-OP scale demonstrates a significant relationship with Agreeableness and the LOT shows a significant relationship with Conscientiousness. After examining the content of the scales, they report that “the LOT is more narrowly focused on expectations about the future whereas the WVPI scale is a broader measure of positive orientation toward the world. Thus, the LOT aligns much more with concepts of persistence and conscientious pursuit of goals, while the breadth of the WVPI scale aligns with a positive attitude toward stimuli external to the self and an overall agreeable disposition toward others” (p. 950-1).

Bringing this discussion back to focus on generalised trust: It is precisely this positive worldview that should be associated with an inclination towards a more inclusive moral community and the willingness (or even desire) to believe that most people

can be trusted. Yet, the measure of optimism that is commonly used in large-scale surveys asks respondents to rate how optimistic they feel about their future. This, clearly, is at risk of tapping the perspectives more aligned with conscientiousness and persistence. It therefore seems that optimism for one's future is not an appropriate proxy for personality in the context of generalised trust; generalised trust is instead associated with trait optimism.

The use of brief personality inventories

It is often reported that the shortened personality scales offer sound alternatives to the longer inventories: they offer good scale reliability, and levels of discrimination between traits that are equivalent to their longer counterparts (John & Srivastava, 1999). However, the way these brief inventories are developed may have consequences for the observed associations between personality and trust. This may account for the range of findings in the literature and, depending upon the specific items used to measure each trait, could even have reversed the direction of the trait-trust association.

The type of associations found between personality constructs and trust-related cognitions and behaviours will vary depending on quite what the personality scales measure. For example, one may expect to find that Agreeableness is positively associated with generalised trust – this would seem a reasonable expectation, given the prosociality associated with trait Agreeableness and that trust is a facet within

Agreeableness in McCrae and Costa's (2010) Five Factor Model. However, the content of the brief inventories tends to be determined by selecting the items that are most important to each trait factor (John & Srivastava, 1999). Agreeableness may therefore not be measured in the same way in all trait inventories: some may not even include the items that are predictive of the trust decision.

3.2.2.5 Suggestions for future research

In order to test personality theory, it does seem appropriate to use a measure of personality rather than proxies such as optimism and feeling of control over one's own life – both of which are likely to reflect evaluations of one's circumstances rather than personality traits. In addition, it would be interesting to test to what extent traits predict self-reported generalised trust when measured by the full set of items in McCrae and Costa's (2010) NEO inventory. The inclusion of all items would mean that, in addition to the trait scores, one may obtain scores for the facets within each trait. Better differentiation within trait measures would lead to more accurate identification of any relevant personality constructs. Investigating associations at the facet level would also allow isolation of the trust facet, to check whether this is in fact driving any observed relationship between trust and Agreeableness. While Müller and Schwieren (2012) did test this, methodological concerns discourage me from relying on their reported findings.

3.2.3 Moral foundations of trust theory

Uslaner's (2002) theory of the moral foundations of trust (MFTT) has been described as an extension to personality theory (Delhey & Newton, 2003). In McCrae and Costa's (1999: 163) model of 'the five-factor theory personality system' (Appendix 3B), goals such as those identified in Schwartz's Human Values Scale are driven by one's underlying personality traits. Several studies note substantial empirical associations between traits and values (e.g. Olver & Mooradian, 2003; Vecchione, Alessandri, Barbaranelli, & Caprara, 2011). Though conceptualised by Delhey and Newton (2003) as an extension of personality theory, I treat Uslaner's (2002) MFTT as a distinct model. This is due to its unique assertion that generalised trust is moralistic in nature.

"Moralistic trust is not about having faith in particular people or even groups of people. It is a general outlook on human nature and... a commandment to treat people as if they were trustworthy."

(Uslaner, 2002: 17-18)

Uslaner's (2002) conceptualisation of *moralistic trust* is of a moral drive to treat others as if they are trustworthy. Uslaner defines moralistic trust as akin to a deeply held value that, as with many values, is either driven by one's own sense of appropriate behaviour, or influenced by the environment and driven by social normative concerns. An alternative to moralistic trust is *strategic trust*, in which the decision to trust is based on one's knowledge of the potential trustee (knowledge

perhaps gained via experience or reputation); strategic trust operates with regard to those we know, rather than strangers (Uslaner, 2002). According to Uslaner's definition, strategic trust therefore cannot be applied broadly to "most people".

Moralistic trust decrees both that we trust because we feel it is the right thing to do, and that we trust those who we expect to share our values and, hence, to be worthy of our trust (Uslaner, 2002). Therefore, by placing our trust in the generalised other, we identify them as a member of our 'moral community' (Uslaner, 2002: 27). Generalised trust (trust in strangers) is, according to Uslaner, rooted in moralistic trust with those who have a higher level of generalised trust having a more widespread, inclusive moral community (a broader 'radius of trust'; Delhey, Newton, & Welzel, 2011). However, Uslaner's theory does acknowledge that even a moral drive to trust is not unquestioningly honoured and that consideration is always given to whether trust seems to be an appropriate or advisable approach in any given situation.

Uslaner (2002) asserts that an alternative to being a generalised truster is to be a *particularised* truster (Yamagishi & Yamagishi, 1994). Particularised trusters have a narrow radius of trust, preferring to place trust only in those who they feel sure are like themselves, for example, those who are known to them or who they regard as members of a salient in-group (defined perhaps by their perception of the person's age, race or socio-economic status): they feel they can safely regard similar others as a member of their moral community. Particularised trusters therefore report a low

level of generalised trust, believing that the majority of people (being unlike themselves) cannot generally be trusted.

The MFTT may be tested by investigating the extent to which survey measures of values, such as Schwartz's Human Values Scale (2001), predict trust-related outcome measures. In the section that follows, I discuss the measurement of values, before describing in sections 3.2.3.2 and 3.2.3.3 the existing literature that has tested MFTT.

3.2.3.1 Measuring values

In reviewing the literature, Morales-Vives, De Raad, and Vigil-Colet (2012) identify six values models. Of these, only one was developed for the purpose of examining individuals' values in cross-national comparative research. This is essential if wishing to test MFTT in addition to evaluating the impact of societal characteristics on generalised trust. Schwartz's (2001) model of human values describes ten values: Universalism, Benevolence, Traditionalism, Conformity, (Need for) Security, Power, Achievement, Hedonism, Stimulation and Self-direction (Bilsky, Janik & Schwartz, 2011; see Table 3.2 below).¹⁸

¹⁸ Hofstede's (2001) Cultural Dimensions Theory and Inglehart and Baker's (2000) revised Modernisation Theory were also intended for use cross-nationally, however, they were designed to draw comparisons between countries rather than between individuals. They would therefore not be suitable for examining the relationship between trust and values as individual, dispositional characteristics.

Also shown in Table 3.2 is Graham et al.'s (2011) Moral Foundations Theory (MFT). Excluded from Morales-Vives et al.'s (2012) review – perhaps too late into the field for inclusion – MFT responds to Shweder, Much, Mahapatra and Park's (1997) theory that values are driven by one's political ideology. While MFT is intended to capture individuals' values and it has been translated into many languages (moralfoundations.org, 2015), as far as I am aware it has not yet been fielded in a context that would permit cross-national comparisons.

Table 3.2: Schwartz's (2001) human values and Graham et al.'s (2011) moral values

Value	Questionnaire items
Schwartz's human values	
<i>Response scale: very much like me, like me, somewhat like me, a little like me, not like me, not like me at all</i>	
Self-direction	Thinking up new ideas and being creative is important to him. He likes to do things in his own original way. It is important to him to make his own decisions about what he does. He likes to be free and not depend on others.
Stimulation	He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life. He looks for adventures and likes to take risks. He wants to have an exciting life.
Hedonism	Having a good time is important to him. He likes to "spoil" himself. He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.
Achievement	It's important to him to show his abilities. He wants people to admire what he does. Being very successful is important to him. He hopes people will recognise his achievements.
Power	It is important to him to be rich. He wants to have a lot of money and expensive things. It is important to him to get respect from others. He wants people to do what he says.
Security	It is important to him to live in secure surroundings. He avoids anything that might endanger his safety. It is important to him that the government ensures his safety against all threats. He wants the state to be strong so it can defend its citizens.
Conformity	It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong. He believes that people should do what they're told. He thinks people should follow rules at all times, even when no-one is watching.
Tradition	It is important to him to be humble and modest. He tries not to draw attention to himself. Tradition is important to him. He tries to follow the customs handed down by his religion or his family.

Value	Questionnaire items
Benevolence	It's very important to him to help the people around him. He wants to care for their well-being.
	It is important to him to be loyal to his friends. He wants to devote himself to people close to him.
Universalism	He thinks it is important that every person in the world should be treated equally. He believes everyone should have equal opportunities in life.
	It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.
	He strongly believes that people should care for nature. Looking after the environment is important to him.
Graham et al.'s moral values	
<i>Response scale: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree, strongly agree</i>	
Harm	Compassion: Compassion for those who are suffering is the most crucial virtue
	Animal: One of the worst things a person could do is hurt a defenseless animal.
	Kill: It can never be right to kill a human being
Fairness	Fairly: When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
	Justice: Justice is the most important requirement for a society.
	Rich: I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.
Ingroup	History: I am proud of my country's history.
	Family: People should be loyal to their family members, even when they have done something wrong.
	Team: It is more important to be a team player than to express oneself.
Authority	Kidrespect: Respect for authority is something all children need to learn.
	Sexroles: Men and women each have different roles to play in society.
	Soldier: If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.

Value	Questionnaire items
Purity	Harmlessdg: People should not do things that are disgusting, even if no one is harmed. Unnatural: I would call some acts wrong on the grounds that they are unnatural. Chastity: Chastity is an important and valuable virtue.

Given its suitability for cross-national comparative study and its presence in the European Social Survey, the remainder of this section focuses on Schwartz's (2001) model of human values.

The Schwartz Human Values Scale

The Schwartz Human Values Scale is a set of 21 items that Schwartz theorises should represent ten distinct (but related) values. According to Schwartz's theory, these ten values combine to form four higher-level constructs: Self-transcendence (Universalism and Benevolence), Conservation (Tradition, Conformity and Security), Self-enhancement (Power, Achievement and Hedonism) and Openness to Change (Stimulation, Self-direction and Hedonism; Hedonism is theorised to fall across both Self-enhancement and Openness to Change). Schwartz (2001) proposes that these values form a quasi-circular structure, such that conflicting values are situated directly opposite each other (see Figure 3.1, below).

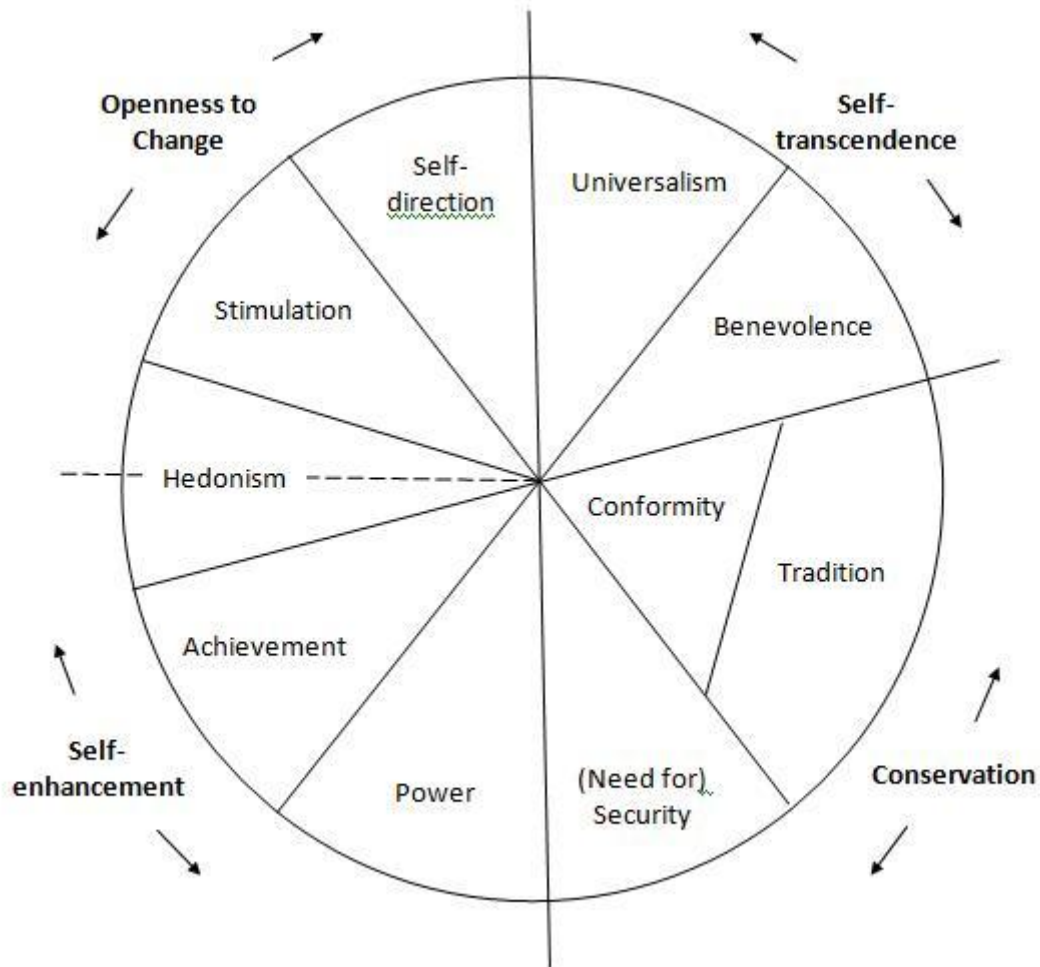


Figure 3.1: Theoretical model of relations among ten motivational types of values. Adapted from Schwartz (2001: 270, Figure 1).

The structure of the HVS appears generally sound, with values only merging – where they do so under factor analysis – with a neighbouring, and therefore related, value. Davidov (2008, 2010) tests this structure with the data from Rounds 2 and 3 of the ESS, respectively. Using multiple group confirmatory factor analysis (MGCFA), Davidov (2010) demonstrates that the number of values that emerge from the 21 HVS items varies across countries from four (Cyprus, Estonia and Slovakia) to seven

(Austria, Denmark, France, the United Kingdom, Ireland, Norway, Poland, Portugal, Russia, Spain, Sweden and Switzerland).

In Section 3.2.2.2 I discuss studies that have used Schwartz's model to test Uslaner's (2002) theory of the moral foundations of trust.

3.2.3.2 Testing MFTT: predicting self-reported generalised trust

It appears from the available literature that few studies have investigated the extent to which Schwartz's (2001) values predict trust. Here I describe the models and findings of those that have done so, and then consider possible adjustments to their methods that might be of benefit to the literature.

Schwartz (2007b) used hierarchical linear modelling to investigate the individual- and societal-level associations with trust in a large, multi-national sample. Using an indexed score (created using the GTQ and a second measure – whether most people would try to be fair or try to take advantage¹⁹), he tested the predictive capacity of the ten HVS value priorities alongside other variables. Schwartz finds significant, positive effects of Universalism and Benevolence, and a significant negative association for (Need for) Security. Conformity was not significantly associated with trust.

¹⁹ "Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?" (Measured on an eleven-point scale, where 0 means 'most people would try to take advantage of me' and 10 means 'most people would try to be fair').

Also testing Schwartz's HVS alongside a range of other variables²⁰, Reeskens (2009) identifies positive effects on social trust²¹ for prioritisation of Schwartz's Universalism and Benevolence values, and negative effects for prioritisation of Tradition and Security. Reeskens tested only those HVS constructs that he theorised to be most strongly associated with social trust (i.e. the above four plus Conformity, which showed no association with trust).

Reeskens (2009) subsequently investigated whether the effects of values on trust are the same cross-nationally. In this analysis, the values coefficients are allowed to vary between countries. Reeskens added to his model the country-level variables GDP per capita and whether the country has a Protestant tradition. In a model that accounts for the individual's values, characteristics of their social environment and their place within it, their community and the society they live in, Reeskens reports that there is indeed cross-national variation in the association between values and self-reported trust.

The empirical literature does offer some support for Uslaner's (2002) theory of the moral foundations of trust. However, the methods used to date are not necessarily the most appropriate for examining these relationships; the inclusion in these models of characteristics that are likely to drive one's values or trust, is likely to have obscured the associations reported by the regression analyses.

²⁰ Socio-demographics, degree of urbanisation, life circumstances (marital status, children, employment), voluntary activities, religious participation, financial comfort and television use.

²¹ Reeskens' (2009) outcome variable was the mean score across the three items in the social trust scale: the GTQ, and items evaluating others' degree of helpfulness and fairness.

In Section 3.2.3.3, I move on to discuss a study that has examined the extent to which individuals' values predict their behaviour in the trust game.

3.2.3.3 Testing MFTT: predicting behavioural trust and trustworthiness

Chuah (2010) conducted an experiment to test whether values predict trust-related behaviour. The data collected included Schwartz's HVS and behaviour as the Sender and Returner in the trust game. In Chuah's version of the trust game, the Sender could invest between £0 - £4 with the Returner. The amount invested was then tripled and the Returner able to transfer any amount back to the Sender. With 96 participants, factor analysis (with Varimax rotation) identified five factors, which the author named as follows:

- Exploration ('personal freedom and novelty'): Openness to Change items in the HVS
- Community (concern for the welfare of society and nature): Universalism and Security items, as well as the 'helpfulness component' of Benevolence
- Ambition (seeking success for its own sake): Self-enhancement items, but excludes 'the pursuit of riches'
- Submission (to external expectations): Tradition and Conformity items and the 'loyalty' component of Benevolence

- Gratification ('rich socialite/ playboy millionaire'): Hedonism items, in addition to 'the pursuit of riches'.

Chuah (2010) found that Schwartz's original factor structure did not hold when measured using the 21-item Human Values Scale. Although the resulting factors are somewhat different, the inadequacy of this scale for representing the full set of ten values supports Davidov's (2008, 2010) findings from factor analyses on data from the European Social Survey. Chuah tested how well trust correlates with both Schwartz's 'prescribed values' as well as her own derived values. In the analysis of the former, she found that trusting behaviour as the Sender in the trust game correlated positively with Universalism and negatively with Benevolence, while behaviour as the Returner correlated positively with (Need for) Security and negatively with Conformity. Using her derived values dimensions, Chuah reported that trusting behaviour is positively correlated with Community and trustworthiness is negatively correlated with Submission.

In regression analyses that account for demographic variables, similar results were obtained: Schwartz's Universalism was still observed to be positively associated with trusting behaviour and trustworthiness negatively associated with Conformity, while the associations with Benevolence and Security were non-significant. The results for the derived values remained the same as in the correlation analysis, with a positive association between trusting behaviour and Community, and a negative association between trustworthiness and Submission (Chuah, 2010).

While there appears to be some association between values and behaviour in the trust game, these are not necessarily those one might intuitively expect when predicting trust. In the above study, this is particularly the case when the HVS constructs are used in accordance with Schwartz's (2001) model. In the section that follows, I describe the need for further exploration of MFTT.

3.2.3.4 Testing MFTT: why is further investigation needed?

It appears that little research has been undertaken into the efficacy of Uslaner's (2002) theory of the moral foundations of trust (MFTT). In the literature that tests the associations between values and self-reported trust, both existing studies examining the associations between Schwartz's human values and self-reported generalised trust risk over-controlling for factors that may be associated with or even driven by one's underlying values. For example, as noted earlier, prosocial individuals may self-select into participation in voluntary activities; Reeskens' inclusion of this in his model may therefore have obscured the relationship between values and trust (e.g. Sturgis et al., 2009). In addition, both Reeskens' and Schwartz's (2007) use of outcome measures that are mean scores across multiple questionnaire items may have resulted in the prediction of something slightly different to generalised trust.

Finally, in his random slopes model that tests whether the relationships between values and trust are stable cross-nationally, Reeskens (2009) uses five of the values

as presented in Schwartz's (2001) human values model. However, Davidov (2010) found that in most countries the discriminant validity between Universalism and Benevolence, and between Conformity and Tradition, is too poor to warrant representing these values individually and that related values should be combined in order to ensure one is measuring the same thing across countries. It is therefore not clear whether all of the values measure the same thing in each of the countries studied. An alternative factor structure, obtained by Davidov (2010) using multiple-group confirmatory factor analysis, would combine Universalism and Benevolence (to form their higher-order value dimension, Self-transcendence) and combine Conformity and Tradition (to form two thirds of the higher-order Conservation value dimension). Using this alternative structure may have an impact on the findings regarding the relevance of the different value dimensions to trust, as well as the degree of variance in these relationships cross-nationally.

3.2.3.5 Summary

In a search of the available literature, it appears that two studies have tested the association between values and self-reported trust, and one study has tested the extent to which values predict behavioural trust and trustworthiness. The results of these studies do offer some encouragement regarding the relatedness between values and generalised trust. What is missing is a theory regarding why particular values should be associated with generalised trust (beyond Uslaner's assertion of

the moral foundations of trust). Further testing of MFTT may help us to gain an understanding of this relationship and of the nature and origins of generalised trust.

In the next section I turn to examine the theoretical and empirical literature relating to the idea that one's level of generalised trust is influenced by the society in which they live.

3.2.4 Characteristics of society: Societal (or Institutional) Theory

“... universalistic, power-sharing institutions, as well as those that sanction noncooperative behavior, provide an environment of credibility – allowing generalized trust to flourish”

(Freitag & Bühlmann, 2009: 1556)

Similarly to Delhey and Newton's (2003) *Societal Theory*, Rothstein and Stolle's (2008) *institutional theory* does not make any claims about the true origins of one's underlying level of trust. Rather, it considers the extent to which the individual's inclination to trust may be influenced by the society's institutions. According to this theory, the individual's response to the generalised trust question (GTQ) is indicative of their evaluation of the trustworthiness of society (Delhey & Newton, 2003: 97; Putnam, 2000).

Societal Theory focuses on respondents' evaluations of the attributes of the country or society in which they live; this theory bears close resemblance to institutional theory (Rothstein & Stolle, 2008). I therefore use these two terms interchangeably. As discussed in Chapter 2, institutional theory can be tested in two ways: via subjective evaluations (for example, the degree of confidence one has in public institutions) and via objective measures (such as national wealth or the degree of income inequality). Here, I focus on objective data because this is the more interesting issue: it makes sense that an individual's evaluations of how trustworthy society is will influence their level of trust in strangers as this may just reflect the individual's perceptual bias. Objective data, however, should bypass this potential bias and offer a relatively accurate description of society.

These objective attributes relate to the nature of national institutions (such as the government and the police), as well as their observed impact on society; for example, the degree of income inequality, the type of political regime, the presence of corruption within government, state endorsement of egalitarian policies and the type of welfare system (Rothstein & Stolle, 2008). It is generally theorised that a society will promote trust if it has a high level of equality, a democratic regime, low levels of government corruption, a universal welfare state and if it endorses policies that promote the inclusion of minority groups. In addition, societies with a higher level of trust are often wealthier. This may be because wealthier societies are often endowed with the above qualities (Rothstein & Uslaner, 2005).

Institutional Theory is built on the expectation that the characteristics and nature of national institutions will influence (or perhaps determine): (1) how safe the individual feels, (2) their expectation that other people will be trustworthy versus untrustworthy, (3) the trustworthiness of the individual's own behaviour, and (4) aspects of the individual's lifestyle that are dependent on, for example, welfare policy and the degree of universalism versus discrimination employed therein (Rothstein & Stolle, 2008).

Rothstein and Stolle (2008) describe their theoretical grounding for these expected effects:

- (1) Feeling un/safe and in/secure: This relates to both institutional corruption and efficacy. Corruption in the political institutions (such as government or parliament) or order institutions (such as the police or the courts) leaves the population uncertain whether they will receive fair treatment and whether the decisions taken by the authorities are legitimate. In corrupt societies there is also the risk of, for example, unfair conviction even in the event that one has not done anything wrong. Similarly, the efficacy of institutions can be crucial, for example, low-efficacy order institutions fail to reassure the population that 'treacherous' behaviour will be penalised. In each instance, Rothstein and Stolle (2008) theorise, members of the population will not feel secure enough to place their trust in strangers.

- (2) Extrapolating the trustworthiness of those in public office to members of the broader population: It should be the norm that people who are endowed with a particular responsibility are able and motivated to live up to it. If they cannot be trusted to do so, then it is theorised that via social normative influence this will set the tone for interactions amongst members of the public.
- (3) Individuals' degree of trustworthiness: If one believes that the people holding public office use corrupt or treacherous means to get what they want, this may encourage members of the public to do likewise. Corruption can become the norm and also be seen as a necessity in order to get one's needs met.
- (4) The individual's life will be positively or negatively influenced by state institutions: Corrupt or inefficacious institutions are likely to employ discriminatory practices, resulting in a negative impact on the lives of those discriminated against and inspiring distrust in public institutions. A similar effect is likely to be observed in societies where income inequality is higher (for example, in those without a welfare state).

Institutional Theory predicts that corruption and inefficacious state institutions will result in unfair and unequal treatment that causes damage to individuals within the population and, eventually, the loss of generalised trust. This mirrors the expectations at the individual-level where insecurity, low levels of universalism and low levels of benevolence are associated with particularised trust.

Herreros (2012) notes that, in a state that is either ineffectual in enforcing law and order or that cannot be trusted to do so fairly, trust within society is likely to plateau; the inclination of 'opportunistic types' to take advantage wherever possible discourages even trusting individuals from believing that most people can indeed be trusted. This results in the trusting contingent being 'crowded out' and becoming as untrusting as the particularised trusters. Due to this levelling effect, Herreros theorises that the effect of individual-level variables that would ordinarily promote trust, such as level of education (or indeed one's values), will be negligible in low quality societies.

Reflections on Rothstein and Stolle's theory

While these processes may indeed be evidenced in society, the influence of the law appears less about promoting trust than providing assurance: if one's inclination to trust is dependent on feeling confident that criminal behaviour will be punished, then they are not acting from a feeling of generalised trust but rather from confidence that the potential criminal will be deterred from proving themselves untrustworthy because they do not want to face punishment (Yamagishi et al., 1999). There is also a risk of confounding 'trust' and 'cooperation' – clearly the two are not the same (Herreros, 2012), with 'cooperation' implying that there may be at least an element of reluctance to engage in the prosocial behaviour. It is therefore possible that state intervention may, through the employment of legal deterrents, elicit forced cooperation and thereby reduce the levels of generalised trust within

society (Herreros & Criado, 2008). However, it is acknowledged that state sanctions can generate a safe environment that is conducive to the development of generalised trust, which can in turn modify social norms and result in the establishment of a more trusting society (Herreros, 2012: 485). Irrespective of the underlying mechanism, it is still the case that a higher quality legal system and government are likely to promote behaviour that is consistent with trustfulness and trustworthiness. We should therefore expect that the endorsement of generalised trust will vary cross-nationally, amongst countries with national institutions that vary on these dimensions.

It is also worth noting that since wealthier societies tend to have higher levels of equality and efficacy, and lower levels of corruption, it may be difficult to distinguish between these effects. To cite each independently as an influence on levels of generalised trust may therefore be somewhat misleading. Finally, there is an argument that the causal pathway operates in the opposite direction: a higher level of generalised trust within society may result in a higher quality society due to the election of non-corrupt officials and support for egalitarian policies (e.g. Uslaner, 2002). While I make no claims regarding the direction of causality, it is worth being aware that this conceptualisation of institutional theory exists – although it has received little acclaim (Rothstein & Stolle, 2008).

As described above, Societal Theory predicts that people who live within a more progressive society will, on average, report higher levels of generalised trust. I discuss below studies that have evaluated the association of such characteristics,

and characteristics relating to the composition of society (e.g. ethnic and religious fractionalisation), with the average (aggregate) level of self-reported generalised trust.

3.2.4.1 Measuring and testing the characteristics of society: predicting self-reported trust

Perhaps largely for logistical reasons, Societal Theory has predominantly been tested using measures of self-reported (rather than behavioural) trust. While there is ample survey data from a large enough range of countries to detect effects of national-level variables, it would be unusual for an experimental study to recruit sufficient samples from enough countries to be able to compare the effects of national-level variables on measures of behavioural trust and trustworthiness. For this reason, I discuss here only the work that has been done on large-scale survey data.

Corruption is commonly measured using the Corruption Perceptions Index. This takes ratings of the level of corruption within a society from experts as well as businesses and private households (Transparency International, 2013). In society-level models (Delhey & Newton, 2005; Kolstad & Wiig, 2012; Rothstein & Stolle, 2008; Zak & Knack, 2001) and multilevel models (Dinesen, 2013 [one-country study]; Rothstein & Stolle, 2002 [one-country study]; Wang & Gordon, 2011; You, 2012), corruption is negatively associated with generalised trust: that is, the more corrupt the society, the lower the level of generalised trust reported by its population

(although, see Freitag & Bühlmann, 2005 and Uslaner, 2002, 2004 for non-significant findings).

Government effectiveness is represented by such measures as those within the World Bank Worldwide Governance Indicators (The World Bank Group, 2014). Here, government effectiveness captures “perceptions of the quality of the public services, the quality of the civil service, and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies” (Kaufman, Kraay, & Mastruzzi, 2010 in Herreros, 2012). These are sourced from surveys of households, companies, ‘business information providers’, NGOs and public-sector bodies (Kaufman et al., 2010: 5). Empirical studies have found that a more efficacious government is associated with a higher level of self-reported trust (Herreros, 2012; Rothstein & Stolle, 2008).

Government response to diversity and migrants Zimdars and Tampubolon (2012) examine the state’s treatment of migrants as measured by the Migrant Policy Index (MIPEX). They report that countries in which the government has implemented policies to support the integration of migrants into the national community record higher levels of generalised trust within the population. Clearly it is not possible to determine whether such policies were introduced to promote integration and happened to be successful, or if such policies were formally introduced because integration was already underway and support for this was already evidenced amongst the population.

Inequality The way in which a government manages the risk of intergroup tensions can exert a powerful influence over the behaviours of social groups. Policies and initiatives that promote intergroup cohesion and integration can help to build generalised trust and aid the development of a predominantly harmonious society (Uslaner, 2004: 502; Zimdars & Tampubolon, 2012). In contrast, those that classify their citizens, for example through non-universalistic welfare states or discrimination of minority groups, act as proponents of intergroup tension and discord.

Inequality of income distribution, measured by the Gini Index, appears to have a substantial negative impact on trust across the board in single-level models (e.g. Berggren & Jordahl, 2006; Bidner & Francois, 2011; Bjørnskov, 2007; Delhey & Newton, 2005; Finseraas & Jakobsson, 2012; Kolstad & Wiig, 2012; Paldam, 2009; Zak & Knack, 2001. Although Robbins [*unpub*] found no significant association) and in multi-level models that also account for individual-level variables (e.g. Herreros, 2012; Olivera, 2013; Park & Subramanian, 2012; Polillo, 2012; Wang & Gordon, 2011; You, 2012).

National wealth A higher level of national wealth, measured as GDP per capita, has been found to be associated with higher levels of generalised trust (Delhey & Newton, 2005; Hamamura, 2012; Finseraas & Jakobsson, 2012; Gundelach, 2014; Lee, 2013; Olivera, 2013; Paldam, 2009; Park & Subramanian, 2013; Polillo, 2012; Reeskens, 2009; Robbins, 2011; Wang & Gordon, 2011), but in other studies it has failed to achieve a substantial enough relationship to be statistically significant

(Berggren & Jordahl, 2006; Bjørnskov, 2007; Herreros, 2012; Kong, 2013; Robbins, 2012; You, 2012). A non-significant associations appears to occur when other contextual variables are added into the model. For example, Hamamura (2011) found that accounting for the level of income inequality and the society being a collectivist (vs. individualist) culture rendered the GDP coefficient non-significant. As noted earlier, wealthy countries do tend to be countries with more progressive, non-corrupt institutions; it is therefore likely to be difficult to distinguish the 'effect' of GDP versus that of certain other characteristics (as discussed above; You, 2012).

Religious composition This is often included in statistical models as either the proportions of the population that belong to specific religious groups, or a dummy variable to indicate the country's official religious tradition. With a noted negative effect of hierarchical religions on trust (Berggren & Jordahl, 2006), and a positive effect of Protestantism, studies often use a variable that indicates the proportion of Protestants or whether it is a Protestant country. The relationship between religious tradition and generalised trust is reported by both society-level (Delhey & Newton, 2005; Kolstad & Wiig, 2012; Rothstein & Stolle, 2008) and multilevel (Park & Subramanian, 2013; Reeskens, 2009; Robbins, 2011) studies. Conversely, Bjørnskov (2007, 2008) found no significant effect of the proportion of Protestants in the population.

3.2.4.2 Testing Societal Theory: predicting behavioural trust and trustworthiness

Johnson and Mislin (2011) report their findings from a meta-analysis of studies using the trust game. The studies cited were implemented in a range of countries that exhibit different degrees of income inequality, corruption, ethnic heterogeneity and other measures that have been found to be associated with levels of self-reported trust. While the authors report no significant associations between the country-level variables and behavioural trust, they do find significant associations for trustworthiness such that higher levels of ethnic heterogeneity or income inequality are associated with lower average trustworthiness.

3.2.4.3 Summary

It appears that certain features of society have a relatively consistent association with self-reported generalised trust and behavioural trustworthiness. National-level variables could therefore provide important contextual information in models designed to assess the relationship between values or personality and these two outcome measures. The relationship between society-level constructs and behavioural trust is less clear, however, further investigation may elucidate the reason for this lack of association.

3.3 Conclusions

While the individual-level theories of the origins of generalised trust have been tested to some extent, the scarcity of these studies means that variations to the design of the study or data handling remain untested. Elaborating on the existing studies may help to uncover the internal processes that contribute to determining whether one reports being trusting or cautious. For Personality Theory this may be achieved by using the full NEO personality inventory to predict self-reported trust as well as behavioural trust and trustworthiness, and by capturing these behavioural measures using a trust game design that more sharply polarises participants into trusting/ untrusting and trustworthy/ untrustworthy.

With regard to the relationships between values and self-reported trust, Reeskens (2009) covers many bases. However, his handling of the HVS variables and use of the social trust scale (rather than the GTQ alone), as well as the presence of additional variables in his model, may be obscuring the relationship between values and trust.

And finally, regarding behavioural trust and trustworthiness, more work is needed that uses alternative trust game designs and different samples to compare with Chuah's (2010) study. Future work could also investigate the predictive utility of traits versus values in explaining scores on trust-related outcome measures.

Despite what appears to be a general disinterest in the individual-level theories of generalised trust, there is some evidence that trust is associated with the

individual's personality and values. While unlikely to be completely resistant to influence by features of the society in which the person lives, Personality Theory and the Moral Foundations of Trust Theory do deserve further evaluation.

Chapter 4

The moral foundations of generalised trust?

4.1 Introduction

The term *generalised trust* refers to trust in strangers, where the stranger is the ‘generalised’ other. While particularised trust (trust in known others or in those who are similar to oneself) is essential for harmonious personal relationships, generalised trust permits the harmonious functioning of the community and society (Uslaner, 2002).

There is as yet no definitive account of who trusts and why. The literature describes theories that cite the potential individual, social and societal origins of trust (see Delhey & Newton, 2003 for an overview). However, while a comparatively vast literature reports conflicting findings regarding the socially-oriented theories, the individual-level personality (Delhey & Newton, 2003) and moral foundations of trust (Uslaner, 2002) theories have been somewhat neglected (as discussed in Chapter 3). This is surprising, given the influence that an individual’s psychological disposition is likely to have on their interpretation of social phenomena. Perhaps due to the limited data available, some studies exclude these constructs altogether (e.g. Van der Veld & Saris, 2010) while others use proxies for personality that are instead likely to be indicators of other things (e.g. Delhey & Newton, 2003; see Chapter 3 for more detail).

This chapter seeks to begin to remedy this inattention to the individual-level origins of generalised trust, by using Schwartz's Human Values Scale (Schwartz, 2001) to test Uslaner's (2002) theory of 'the moral foundation of trust' (MFTT)²². In addition, I use multilevel modelling to test the robustness of the relationship between values and trust against influence by society-level characteristics (e.g. Rothstein and Stolle, 2008). My measure of trust is a single item, the generalised trust question (GTQ).

The GTQ and the human values items are measured at the level of the individual (Level 1 in the multilevel model), with each respondent reporting their level of trust and their degree of association with the vignettes that characterise each of the human values. Level 2 is populated by variables measured at the level of society and may include: national wealth (Gross Domestic Product per capita; GDP), inequality (the General Inequality Index coefficient; Gini), the level of corruption (Corruption Perception Index; CPI) and government effectiveness (as reported in the World Bank Governance Indicators).²³

Below, I give a brief recap of the literature relating to moralistic trust discussed in Chapter 3. I then discuss its relationship with values before considering the literature regarding the potential influence of society-level characteristics on this relationship.

²² This is the name I have given this theory and not a name that Eric Uslaner has used to describe it. Any inaccuracies implied by its use are therefore mine.

²³ I identify in Section 4.3.2 the variables that I use in my models.

4.1.1 Generalised trust at the individual-level (Level 1)

Here I look at Uslaner's (2002) conceptualisation of generalised trust as 'moralistic' trust and use his descriptions of the generalised truster and the particularised truster to develop a theory regarding which values are likely to be associated with generalised trust.

4.1.1.1 Generalised trust as moralistic trust

Uslaner (2002) defines *moralistic trust* as a moral drive to treat others as though we expect them to live up to the trust placed in them:

"Moralistic trust is not about having faith in particular people or even groups of people. It is a general outlook on human nature and... a commandment to treat people as if they were trustworthy."

(Uslaner, 2002: 17-18)

Generalised trust has been found to be positively associated with a range of personal attributes, including age (e.g. Gundelach, 2014; Herreros, 2012; Park & Subramanian, 2012. See Olivera [2013] for conflicting findings and Lee [2013] for a non-significant effect), being male (e.g. Olivera, 2013; You, 2012; Zimdars & Tampubolon, 2012 – see Lee [2013] for conflicting results, and Gundelach [2014] and Herreros [2012] for a non-significant effect), level of education (e.g. Gundelach,

2014; Paxton, 2007; Olivera, 2013; You, 2012) and socio-economic status (Paxton, 2007).

In discussing moralistic trust, Uslaner (2002) notes that the moralistic truster trusts both because they feel it is the right thing to do and because they trust those who they expect to share their moral values (hence, to be trustworthy; Uslaner, 2002). By placing our trust in the generalised other we identify them as a member of our 'moral community' (Uslaner, 2002: 27). This stands in contrast to particularised trusters, who purportedly have a narrower radius of trust and prefer to place trust only in those who they feel sure are like themselves: those who are known to them or who they regard as members of their in-group (on some salient dimension, defined perhaps by their perception of the person's age, ethnicity or socio-economic status).

The logic of an association between trust and values is not difficult to comprehend: it is obvious that few would choose to place their trust in somebody they knew to be of questionable moral character. We expect those of dubious values to be motivated to betray our trust, valuing their material gain from doing so far above any altruistic reward that somebody else may have felt from behaving in a trustworthy manner.

As a moral choice, trust is conceptualised (in contrast to particularised trust) as something that is driven by intention. Uslaner's (2002) theory of the moral foundations of trust asserts that generalised trust is in part a social signal: for the generalised truster the act of trusting another person is not simply driven by

necessity (e.g. ‘if I don’t place my trust in this person, X will not happen and I’ll have to go without Y’) but by a disinclination to subscribe to a negative worldview regarding other people. It is irrelevant whether this disinclination comes naturally or has had to be stubbornly clung to over the years through occasional errors of judgement. To the generalised truster, it is important that they continue to treat others as though they are trustworthy.

In the next section, I consider which values are likely to be associated with generalised trust. One would expect that, if generalised trusters are optimistic individuals who intend to treat others as though they are trustworthy, they should be people who like other people; a high score on the generalised trust question (GTQ) would run counter to a misanthropic outlook. With this in mind, examining Schwartz’s (2001) model it is clear that certain values stand out as being more relevant to the social sphere. I discuss below the available empirical evidence regarding the moral foundations of trust. After identifying my hypotheses for the individual-level, I turn to look at the possible influence of the characteristics of society.

4.1.1.2 Generalised trust and human values

Reeskens (2009) reported that Schwartz’s (2001) Conformity and Tradition should be relevant to the maintenance of social structures and norms, while Self-transcendence values should determine the breadth of one’s moral community. In

this section, I examine the literature on values and trust in order to elaborate on this assertion and explore the mechanisms that may drive Uslaner's (2002) postulated relationship between values and trust.

The nature of generalised versus particularised trusters

Uslaner (2002) describes the generalised truster as a secure, optimistic individual with a healthy sense of self-determination:

"Moralistic trust is predicated upon a view that the world is a benevolent place with good people... that things are going to get better, and that you are the master of your own fate."

(Uslaner, 2002: 23)

Meanwhile, particularised trusters are characterised rather differently:

"Particularized trusters view the outside world as a threatening place, over which they have little control. They may even see conspiracies against them. They are self-centred, fear that the deck is stacked against them, and have authoritarian tendencies; they often have difficult times establishing personal relationships. Most of all, they are pessimistic about the future and their own ability to control it."

(Uslaner, 2002: 31)

These two quotes illustrate the stark differences in character that may be expected between generalised and particularised trusters. Uslaner (2002) reports that an individual who has a high level of generalised trust is likely to care about other people, and to be optimistic about the future and their own capacity to have a positive influence on it. In contrast, particularised trusters are described as self-centred, pessimistic individuals who have ‘authoritarian tendencies’ and who feel the world to be ‘a threatening place’ that they have little capacity to control. It is clear that these two characters are likely to hold different values. Considering which of Schwartz’s (2001) values may underlie generalised trust may therefore be approached from two directions: which values are likely to be associated with generalised trust and which with particularised trust.

The moral foundations of generalised trust versus the moral foundations of particularised trust

The description of the generalised truster is of somebody who is likely to be prosocial, perhaps as indicated by Schwartz’s Self-transcendence values (Universalism and Benevolence).²⁴ Meanwhile, the description of particularised trusters as having ‘authoritarian tendencies’ may be helpful in considering the

²⁴ While it could be argued that Schwartz’s Self-direction and Stimulation values would be relevant to generalised trust (with their focus, respectively, on the importance of determining one’s own path in life and a fondness for taking risks), their position on the opposite side of Schwartz’s quasi-circular values wheel to the Conservation values means it would not be appropriate to include them in these models. In addition, it is debatable whether they can be considered as ‘moral’ values (Schwartz, 2007a).

possible mechanism behind moralistic trust. We can do this by examining the moral standpoints that are associated with right-wing versus liberal ideologies.

Authoritarianism is associated with right-wing values, and certain of the Schwartz HVS constructs have been found to correlate with both right-wing authoritarianism (RWA) and social dominance orientation (SDO; von Collani & Grumm, 2009). Graham et al. (2011) develop a model, Moral Foundations Theory (MFT; see Chapter 3, Table 3.2), that examines the origins of values. MFT tests Shweder et al.'s (1997) theory that, counter to the common assumption that one's ideological affiliation reflects one's values, the individual's values are driven by their underlying ideology:

“... liberalism was hypothesized to indicate a morality in which the individual is the locus of moral value. In such a moral world, moral regulation revolves around protecting individuals from harm or unfair treatment by other individuals or by the social system. In contrast, conservatives – at least, the social conservatives of the religious right – try to create more tightly ordered communities... In such a moral world, the individual is not the primary locus of moral value; the building block of society is thought to be the family, and a much greater emphasis is placed on virtues and institutions that bind people into roles, duties, and mutual obligations.”

(Graham et al., 2011: 368)

In the taxonomy of their Moral Foundations Theory (MFT), Graham et al. (2011) hypothesise that the more liberal-minded will prioritise the prevention of Harm and the promotion of Fairness, while the more conservative will prioritise loyalty to the

Ingroup, obedience to Authority and the maintenance of Purity²⁵. Graham and colleagues' investigation into the latent constructs that underlie these values support their theoretical distinction between liberals and conservatives.

Human values and ideological orientation

Given the characters described above by Uslaner (2002), we should expect the particularised and generalised trusters to report virtually opposite scores on the values dimensions relating to interpersonal and intergroup dynamics. If I am correct in transferring Graham et al.'s (2011) Moral Foundations Theory to the motivations behind generalised and particularised trust, there should be some evidence of an association between ideological orientation (i.e. liberal versus conservative) and human values.

This relationship has been examined in a number of studies. While testing their Moral Foundations Theory, Graham et al. (2011) investigated the correlations between their moral values and Schwartz's (2001) human values, finding that both the constructs relating to Conservation and those relating to Security correlate with Graham et al.'s Authority (respectively, $r = .62$ and $r = .48$), Ingroup ($r = .53$ and $r = .53$) and Purity ($r = .54$ and $r = .37$) values. Similarly, Von Collani and Grumm (2009) report that Right-wing Authoritarianism correlates with Schwartz's higher-order

²⁵ Capitalisation indicates the names of the moral values within Graham et al.'s (2011) Moral Foundations Theory: Harm, Fairness, Ingroup, Authority and Purity (see Chapter 3, Table 3.2).

Conservation ($r = .40$) construct. Conservation also correlates positively with their General Prejudice value ($r = .38$).

Meanwhile, Graham et al. (2011) report that their Harm avoidance value correlates with Schwartz's (2001) constructs relating to Benevolence ($r = .47$) and social justice ($r = .52$), and von Collani and Grumm (2009) that Right-wing Authoritarianism and General Prejudice correlate negatively with Schwartz's higher-order Self-transcendence (respectively, $r = -.29$ and $r = -.27$) and Openness to Change ($r = -.33$ and $r = -.28$) values.

Ideological orientation, human values and generalised trust

It stands to reason that those who prioritise the reputation of the family or community (Shweder et al., 1997) are likely to prefer to trust only those who they feel sure will not violate the code of conduct, while the more egalitarian values of those who prioritise the welfare of the individual (Haidt & Graham, 2007) indicate that they still regard those who are dissimilar (on whatever dimension) as members of the same moral community. Harbours an expansive moral community is essential to the experience of Uslaner's (2002) moralistic trust.

It appears that the moral foundations of generalised trust – and indeed the moral foundations of particularised trust – may have their origins in one's ideological orientation. This works well in theory, but we have not yet examined the (albeit

limited) empirical evidence currently available. In the next section I discuss the studies that have tested the relationship between Schwartz's human values and generalised (or social) trust.²⁶

4.1.1.3 Empirical findings regarding the moral foundations of trust

Though not widely tested, Uslaner's (2002) moral foundations of trust theory (MFTT) has gained some support in the literature. Schwartz (2007) and Reeskens (2009) both report findings from studies that investigate the strength of Schwartz's human values in predicting social trust.

As discussed in Chapter 3, both Schwartz (2007) and Reeskens (2009) find that certain HVS constructs significantly predict social trust. Schwartz finds that prioritising Universalism and Benevolence is associated with a higher level of self-reported social trust²⁷, while (Need for) Security is associated with a lower level of social trust. He reports a non-significant finding for Conformity and Tradition. The findings regarding Universalism and Benevolence lend support to the theory that trust is higher in those who hold egalitarian values, while the finding for Security may reflect the particularised truster's feelings of vulnerability (Uslaner, 2002). It

²⁶ I was unable to find any studies that test the MFTT using a measure of generalised trust alone (i.e. the GTQ). The *social trust* scale comprises the GTQ as well as two items that ask respondents to rate others' degree of helpfulness (versus looking out for themselves) and fairness (versus trying to take advantage).

²⁷ Schwartz (2007) captured generalised trust using both the GTQ and the item that asks respondents to evaluate the fairness of other people.

makes sense that those who prioritise security concerns are likely to be more risk averse and therefore less likely to endorse placing trust in strangers.

Using Schwartz's HVS, Reeskens (2009) identifies positive effects on social trust²⁸ for respondents' inclinations to prioritise Universalism and Benevolence values, and negative effects for inclinations to prioritise Tradition and Security. These effects persist despite the presence in the model of a range of other items associated with generalised trust (e.g. marital status, having children, income satisfaction, degree of urbanisation of the local area and participation in voluntary organisations).

The findings of both Schwartz (2007) and Reeskens (2009) support the theory of an association between values and social trust. The direction of these findings is also in line with the expectations generated by the theory I described above. Those who prioritise Universalism and Benevolence (i.e. the prevention of harm to individuals) are more inclined to report generalised trust, while those who are more concerned about Security are less trusting. The conflicting and null effects regarding Tradition and Conformity, however, are less encouraging.

4.1.1.4 Summary and hypotheses: individual-level drivers of generalised trust

The theoretical and empirical literature described above offer some encouragement regarding Uslaner's (2002) theory of the moral foundations of generalised trust.

²⁸Reeskens' (2009) dependent variable is the mean score across the three items in the social trust scale: the GTQ, and items evaluating others' degree of helpfulness and fairness.

While the empirical evidence does not show unequivocal support for all aspects of the theory I outlined in Section 4.1.1.2, there appears to be reason to expect certain of Schwartz's values to be useful in testing this model.

Based on the theory and findings discussed above, I expect that people who prioritise Benevolence and Universalism values (i.e. who hold a liberal, egalitarian ideology and an orientation towards the prevention of harm to individuals) will report higher levels of generalised trust, while those who prioritise Security will report lower levels of trust. In addition, it seems likely that prioritising Conformity and Tradition should be associated with an overriding concern for protecting the status of the in-group. However, while there is reason to expect these values to be negatively associated with one's level of generalised trust, the empirical evidence presents mixed findings.

Hypothesis 1 Prioritising Universalism and Benevolence will be positively associated with generalised trust.

Hypothesis 2 Prioritising Security will be negatively associated with trust.

Research question 1 Is prioritisation of Conformity and Tradition negatively associated with trust?

This section has described the first part of this investigation: testing the relationship between values and generalised trust. In the section that follows I discuss the possible influence of societal characteristics on generalised trust and consider whether these attributes may influence the relationships between values and trust.

4.1.2 The impact of the characteristics of society (Level 2)

It may be tempting to assume that any association between values and trust should be replicated globally. However, it is probable that variables at the societal level will exert an influence over the degree to which the individual is willing to place trust in their fellow citizens. The associations between values and trust may therefore vary as certain societal characteristics influence the degree to which the average citizen feels inclined to trust or to show caution. However, these same features of society may have an impact on individuals' values; since values are at least in part driven by social norms, the type of society the person lives in is to some extent likely to shape their value priorities. It is not clear whether these effects occur in parallel, with one's values and proclivity for generalised trust both being affected by society, or if the characteristics of society can instead disrupt the relationship between values and trust.

4.1.2.1 The characteristics of society and generalised trust

“... universalistic, power-sharing institutions, as well as those that sanction noncooperative behavior, provide an environment of credibility – allowing generalized trust to flourish”

(Freitag & Bühlmann, 2009: 1556)

As discussed in Chapter 3, a range of society-level characteristics are theorised to influence individuals' levels of generalised trust. Rothstein and Stolle (2008) postulate that institutions exert an influence on generalised trust by affecting (1) feelings of safety, (2) the expectation of others' trustworthiness, (3) the individual's own trustworthiness (via the 'false consensus effect'; Orbell and Dawes, 1991), and (4) the individual's lifestyle, via the degree of equality in the distribution of resources and access to opportunities (see Section 3.2.4 for a discussion of how these effects may occur). In measurable terms, these equate to an impact of such attributes as the efficaciousness of and degree of corruption within state institutions (such as the legal system and the government), the types of political system (e.g. democracy versus authoritarian) and welfare state (e.g. means tested versus universalistic), and the level of national wealth (although this may be relevant primarily due to its positive association with government effectiveness and lower levels of corruption).

Empirical studies report that a higher level of generalised trust is positively associated with a lower level of corruption (e.g. Wang & Gordon, 2011; You, 2012 – although see Freitag & Bühlmann [2005] and Uslaner [2002, 2004] for non-significant findings), a higher level of government effectiveness (e.g. Herreros, 2012; Rothstein & Stolle, 2008), more cross-cuttingness across dimensions of diversity (Finseraas & Jakobsson, 2012)²⁹, efforts by the state to integrate migrants (Zimdars

²⁹ Cross-cuttingness relates to individuals' membership in multiple social groups: While a group of individuals may form an in-group on one dimension (for example, ethnicity), they may in fact be members of different groups on another dimension (for example, religion). This may positively reduce

& Tampubolon, 2012), low levels of inequality (e.g. Herreros, 2012; Olivera, 2013; Park & Subramanian, 2012), higher national wealth (e.g. Gundelach, 2014; Park & Subramanian, 2013; Reeskens, 2009 – although see Berggren & Jordahl [2006], Herreros [2012] and Kong [2013] for non-significant associations), a Protestant tradition (Park & Subramanian, 2013; Reeskens, 2009; Robbins, 2011b – see Bjørnskov [2007, 2008] for a non-significant finding regarding Protestantism) and non-hierarchical religion (Berggren & Jordahl, 2006). Amongst these associations we see support for Rothstein and Stolle's (2008) theory, with a range of societal characteristics showing significant relationships with generalised trust.

4.1.2.2 Human values and the characteristics of society

Given that my models will include both values and society-level characteristics, it is important to consider the potential interactions between these and the impact this may have on the results. I discuss this here in relation to values measured on aggregate and compared at the national level. Inglehart and Baker (2000: 23) report clustering relating to the society's religious tradition and history of communism, with cross-national variation in attitudes towards authority (the prevalence of traditional versus secular orientations) and in the prevalence of 'survival' versus 'self-expression' values.

the degree of 'in-group solidarity' and facilitate the nurturing of a broader moral community (Finseraas & Jakobsson, 2012).

Inglehart and Baker chart countries' positioning on these two values dimensions using a set of quadrants³⁰, revealing that the spread of countries mirrors the global distribution of wealth, with the poorest countries in the Traditional/ Survival quadrant and the wealthiest in the Secular/ Self-expression quadrant. A country's wealth has implications for the prevalence of materialist versus post-materialist values, with those in wealthier countries more likely to endorse post-materialist concern for quality of life over concern for economic sufficiency (Inglehart & Baker, 2000). This means that respondents in countries with higher GDP may give lower priority to Schwartz's Conservation values (Conformity, Tradition and Security) than those in countries with lower GDP.

In addition to modelling values at the individual-level, Schwartz's (2006) model also describes values at the aggregate level. These *cultural* values form three dimensions: Autonomy–Embeddedness, Hierarchy–Egalitarianism and Harmony–Mastery. The first examines whether the society is more concerned with independence and self-fulfilment (Autonomy) or the maintenance of social norms and tradition (Embeddedness), the second whether it endorses social equality (Egalitarianism) or inequality (Hierarchy), and finally whether it seeks to exist harmoniously within 'the social and natural world' (Harmony) or if it seeks to control them (Mastery – Schwartz 2006; Vauclair & Fischer, 2011: 647). While measurement is taken at the individual-level, these cultural values are analysed as mean scores at the level of society.

³⁰ I use the term 'quadrant' loosely: The deployment of two bipolar scales means that the chart area could be presented as a 2 x 2 quadrant, however, the pattern of placements within that area is approximate.

In predicting leniency towards 'dishonest-illegal issues', Vauclair and Fischer (2011) report interaction effects between the society's placement on the Hierarchy–Egalitarianism scale and individuals' average religiosity and income. Amongst cultures oriented towards Egalitarianism, tolerance of dishonesty shows a negative relationship with income; as income increases, tolerance of dishonesty decreases. The opposite trend is observed in cultures that are oriented towards Hierarchy. A similar interaction effect is observed between Egalitarianism and income: in Egalitarian cultures individuals' tolerance of dishonesty decreases as mean income increases; however, in cultures oriented towards Hierarchy, there is no measurable effect of mean income on leniency towards dishonesty.

It appears clear that the dominant values within a society can influence the values of those living within it. In the next section I draw together the elements discussed above to consider the possible impact of society's characteristics on the expression of generalised trust.

4.1.2.3 Characteristics of society, values and generalised trust

As outlined in Section 4.3 and as discussed in Chapter 3, societal characteristics that indicate the quality of society are associated with the average level of self-reported generalised trust. Recall also the theory discussed above, based on Graham et al.'s (2011) Moral Foundations Theory, regarding the relevance to trust of the

prioritisation of concern for the individual versus concern for the social group. This lends intuitive appeal to the idea that values promoted at the institutional level may have a normative influence on individuals' value priorities and directly or indirectly influence the prevalence of generalised trust within the population.

“... value-attitude relations linking motivational orientations (values) to social evaluations (attitudes) will vary systematically to the extent that... the environment reinforces or impedes the expression of motivations”

(D. Boer & Fischer, 2013: 6)

As discussed by Inglehart and Baker (2000), a country's economic standing and degree of industrialisation have an impact on levels of education and income, in addition to permitting evolution of the population's values. Provided the society's institutions support a reduction in survival concerns, an increase in wealth and industrialisation are likely to reduce the need for security and a move towards post-materialism should eventually promote the prioritisation of egalitarian values. Given the earlier discussion of the drivers of generalised trust it would be reasonable to expect that, in most cases, societies should see an increase in trust as their affluence and degree of egalitarianism increases.

Schwartz (2007) included the cultural values *Egalitarianism* and *Embeddedness* in his regression model and notes that these two variables account for 43% of the variance in trust between countries. However, it seems reasonable to flag the possibility that their inclusion may have had an impact on the reliability of the model since they do

have theoretical associations with the individual-level values. In addition, despite having only twenty countries in the model, Schwartz employed six country-level variables. This exceeds the majority of the recommendations regarding the number of Level 2 cases required per Level 2 variable and may have made these results somewhat unreliable (Snijders & Bosker, 2012).

Reeskens' (2009) final model is a multilevel model that includes two variables measured at the level of society – GDP and the presence/ absence of Protestant tradition. He reports that, in random intercepts analysis, these two variables are highly predictive of levels of generalised trust. In random slopes analysis, Reeskens finds that the slopes of the five values (Security, Universalism, Benevolence, Conformity and Tradition) do vary cross-nationally. This indicates that the relationship between each value and generalised trust is not consistent across countries, but rather varies with GDP and religious tradition.

In the next section I outline my hypotheses. In Section 4.1.3 I then describe the developments that the current study offers in comparison to the analyses presented by Reeskens (2009).

4.1.2.4 Summary and hypotheses: the characteristics of society

I described my hypotheses for the individual-level (Level 1) predictors of generalised trust in Section 4.1.1.4. Here I present my hypotheses relating to the variables that operate at the level of society (Level 2).

Societal-level drivers of generalised trust

Values and levels of generalised trust vary cross-nationally, and the pattern of variance in both appears to be associated with national-level characteristics such as the society's wealth and the nature of its political system. With this in mind, I anticipate that a higher level of generalised trust will be observed in societies that have higher GDP per capita, lower income inequality, lower corruption and a higher level of government effectiveness.

Hypothesis 3 GDP will be positively associated with generalised trust.

Hypothesis 4 Income inequality will be negatively associated with trust.

Hypothesis 5 Corruption will be negatively associated with trust.

Hypothesis 6 Government effectiveness will be positively associated with trust.

The quality of society and the relationships between values and trust

Having tested the relationship between values and trust, and between characteristics of society and trust, I then use random slopes models to test whether the relationships between values and trust are consistent under different societal conditions. While Reeskens (2009) observed significant differences in these relationships cross-nationally, given my adjustments to the use of the variables and specification of the models, it is not clear whether my results will parallel these.

Research question 2 Are the relationships between the human values constructs and generalised trust stable cross-nationally?

4.1.3 Developments to existing research

Reeskens (2009) noted that there has been scant attention paid in the empirical literature to testing Uslaner's (2002) theory of the moral foundations of generalised trust. It appears from my review of the literature that this is still the case (see Chapter 3). I therefore conduct another test of the theory which, while asking similar research questions to those tackled by Reeskens, makes adjustments to the data handling and analyses that should improve the reliability and interpretability of the results.

In his use of the human values constructs, it is unclear whether Reeskens (2009) adjusted the scores to take account of respondents' use of the scale (centring the scores around the respondent's mean score as described on the website of the Norwegian Social Sciences Data Service; NSD, 2013). Also, Reeskens uses the five individual values in his models while the literature suggests that in order to obtain cross-national equivalence it would be more appropriate to combine certain values so that they approximately resemble Schwartz's four higher order values (Davidov, 2008, 2010).³¹

In addition, Reeskens' (2009) models include a wide range of individual-level variables. While this to some extent demonstrates the robustness of the values constructs as predictors of social trust, the presence of these variables is likely to influence the observed associations between values and trust. For example, the inclination to participate in voluntary organisations may be driven by the individual's values – in which case its inclusion in the model would unnecessarily detract from the magnitude of the relevant values' relationship with social trust. And, finally, Reeskens' analyses seek to illuminate the relationship between values and *social* trust, measured as the mean score on the three-item social trust scale, rather than strictly generalised trust (see Chapter 3 for a discussion of this distinction).

Although perhaps subtle, these adjustments are necessary to ensure an adequate test of Uslaner's (2002) theory of the moral foundations of generalised trust.

³¹ Equivalence would indicate that each construct holds the same meaning cross-nationally. This is important when seeking to interpret the results and understand the possible origins of generalised trust.

4.2 Data and Methods

To address the research questions outlined above I use data from Round 3 of the European Social Survey (ESS). Twenty-five countries participated in Round 3 of the ESS: Austria, Belgium, Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Latvia, the Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine and United Kingdom.³² The Round 3 questionnaire was fielded in 2006. Responses to this Round of the survey should be relatively uncorrupted by the instability and uncertainty wrought by the financial crisis that began around this time.

I use multilevel modelling to test the hypotheses and research question outlined above. A multilevel model is a regression analysis that accounts for the effects of variables at more than one level of measurement. In the present case, I examine the predictive capacity of variables measured at the levels of the individual (Level 1) and society (Level 2). At the individual-level I include the Schwartz HVS items in addition to standard demographic controls. At the society-level, I include measures of key characteristics of society: GDP per capita, income inequality, corruption and government effectiveness.

³² I exclude the data from Latvia and Romania from this study due to their having no design weights.

In the sections below I describe the outcome variable, and the individual- and society-level predictor variables.

4.2.1 Dependent and predictor variables

4.2.1.1 Dependent variable: generalised trust

As discussed earlier, my dependent variable is the generalised trust question (GTQ). Similarly to that used in the General Social Survey (amongst others), the GTQ in the ESS reads: “In general, would you say that most people can be trusted or that you can’t be too careful in dealing with people?”. Responses to this item are measured on an eleven-point scale, which runs from 0 to 10 where a higher score indicates a higher level of trust: 0 represents “you can’t be too careful”, and 10 represents “most people can be trusted”.

4.2.1.2 Individual-level predictor variables: Schwartz’s human values

The human values I use in this study, and the items used to measure them, are described in Table 4.1 below. This is a subset of the full 21-item scale, using only the eleven items that measure Universalism, Benevolence, Security, Conformity and Tradition. Each item is measured on a six-point Likert scale: (1) very much like me, (2) like me, (3) somewhat like me, (4) a little like me, (5) not like me, and (6) not like

me at all. Before using the HVS items it is necessary to perform certain manipulations (as mentioned above, and as recommended by Schwartz [*online*] and instructed by NSD [2013]), in order to take account of its quasi-circular structure (see Chapter 3, Section 3.2.3.1) and the fact that since these are value *priorities*, the score for each value is relative to that of each of the others. I outline these manipulations in Section 4.2.2.1 below.

Table 4.1: Schwartz's HVS constructs and measures

Construct	Item wording
Universalism Understanding, appreciation, tolerance and protection for the welfare of all people and for nature.	(1) He thinks it is important that every person in the world should be treated equally. He believes everyone should have equal opportunities in life. (2) It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them. (3) He strongly believes that people should care for nature. Looking after the environment is important to him.
Benevolence Preservation and enhancement of the welfare of people with whom one is in frequent personal contact.	(4) It is very important to him to help the people around him. He wants to care for their well-being. (5) It is important to him to be loyal to his friends. He wants to devote himself to people close to him.
(Need for) Security Safety, harmony and stability of society, of relationships, and of self.	(6) It is important to him to live in secure surroundings. He avoids anything that might endanger his safety. (7) It is important to him that the government ensures his safety against all threats. He wants the state to be strong so it can defend its citizens.
Conformity Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.	(8) He believes that people should do what they are told. He thinks people should follow rules at all times, even when no one is watching. (9) It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.
Tradition Respect, commitment and acceptance of the customs and ideas that one's culture or religion impose on the individual.	(10) It is important to him to be humble and modest. He tries not to draw attention to himself. (11) Tradition is important to him. He tries to follow the custom handed down by his religion or his family.

Source: NSD (2013)

4.2.1.3 Society-level predictor variables

As noted earlier, existing research has demonstrated associations between generalised trust and a range of society-level characteristics such as GDP, ethnic diversity, corruption, state efficacy and income inequality. These national-level statistics serve to set the individual-level data in context.

Table 4.2: Country-level contextual variables (Level 2)

Construct	Variable	Source
National wealth	GDP per capita	World Bank national accounts data and OECD National Accounts data files; NESSTAR
Corruption	CPI score	NESSTAR; Transparency International
Income inequality	Gini coefficient	NESSTAR; The World Factbook
Government effectiveness	Government effectiveness	World Bank Worldwide Governance Indicators

Table 4.2 identifies the Level 2 variables that were considered for inclusion in this study and the data sources used. The Gross Domestic Product (GDP) of a country is the “market value of all officially recognized final goods and services produced” over a defined time period. GDP per capita is the value of GDP divided by the number of people in the population of that country. This figure is the one I use as an indicator of standard of living within that country. GDP per capita is calculated by dividing the country’s GDP by the midyear population (The World Bank Group, 2014). It is an open numeric variable and the figures given by the World Bank are measured in US dollars. In my analyses I rescale this variable to be scored in thousands.

The Corruption Perceptions Index (CPI) uses 'expert assessment and opinion surveys' to award individual countries a score to reflect their degree of corruption. This score may range from 0 to 100, where 0 indicates a high level of corruption and 100 that the country has very little corruption.

The Gini coefficient measures the degree of equality of income distribution within a country. This is usually scored from 0 to 1, where a score of 0 would indicate perfectly equal distribution and the nearer a country scores to 1 the greater the degree of inequality.

The measure of government effectiveness is a set of perceptions-based measures that draw together "perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies". These perceptions are surveyed from companies and households in addition to relevant organisations and public-sector groups (Kaufman et al., 2010: 4). Government effectiveness is scored from -2.5 to 2.5, where a higher positive score indicates a higher level of effectiveness.

4.2.2 Methods and analyses

4.2.2.1 Preparing the human values variables

Before the Schwartz HVS items can be used, the raw scores need to be centred to account for each respondent's use of the scale. Instructions for how to do this can be found on the European Social Survey's data website (NSD, 2013; see also Schwartz, *online*). Each respondent's prioritisation score on each value construct is generated by subtracting their own mean score (across all ten HVS values) from their raw score on that value. This sets zero as the score for 'average priority' and means that if a participant scored 3 on Security, but their overall mean score was 3.5, then this person's value priority for Security would be $-.5$. Since their 'mean prioritisation' is zero, a score of $-.5$ tells us that this person affords Security (as measured by the HVS) slightly below-average priority. In referring to a 'value priority', I therefore refer to the priority indicated by these figures (the priority of each value relative to the other values in Schwartz's model), rather than a priority ranking made by the respondent themselves.

The reason for centring these data is to ensure that the respondent's score on a particular value reflects its place in their value priorities. For example, if two respondents score an average of 3 on Universalism ("somewhat like me"), for one person this may be the lowest score they obtain across the ten human values, while for the other person it could be the highest. Therefore, by looking at just the one score in isolation it is not possible to determine how important the value is to the

respondent. Centring the respondent's ten values scores around their mean score therefore takes their use of the response scale into account.

My aim here is to test the relative importance of certain HVS constructs to generalised trust. For example, to test whether someone who gives Universalism or Benevolence the highest priority reports a higher level of generalised trust than someone who prioritises, for example, Security. As noted above, centring the HVS values constructs in the recommended manner sets them in a hierarchy that's personalised to each respondent. This allows me to meaningfully interpret the results irrespective of individuals' use of the response scale.

4.2.2.2 Individual-level 'control' variables

With factors such as age, gender and level of education having shown significant associations with generalised trust, there is an argument for excluding them from my analyses: since they are also likely to be associated with the individual's values (but not necessarily likely to influence the relationship between values and trust), their presence in the model may simply absorb some of the association and mask the relationship between the values items and generalised trust. However, since it is conventional to include these variables as standard, I present both models that include them and models that omit them.

One variable that could in theory influence the association between values and trust is financial insecurity (a self-report measure of the degree of comfort living on one's current household income): somebody may hold egalitarian values and not be overly concerned about Security, but a lack of financial resources may lead them to be cautious about who they trust due to the difficulty of recouping any losses they might incur in the event of betrayal. Given that financial insecurity is also independently associated with generalised trust, it is possible that the presence of this variable will undermine the association between values and trust.

4.2.3 Analyses

My primary analyses are multilevel models, where Level 1 is the individual and Level 2 is the society or country they live in. I begin with random intercept models which test the associations between the outcome variable and the variables at Level 1 and Level 2. However, these models are unable to evaluate the impact of Level 2 variance on the Level 1 predictor variables, assuming instead that this is the same across groups (countries). I examine the random intercept models first, to test for any associations between human values and trust (testing hypotheses 1 and 2, and research question 1) and between the characteristics of society and trust (hypotheses 3 – 6). I then run random slopes models to evaluate the extent to which the relationships between Level 1 predictor variables (the HVS values constructs) and the outcome variable (generalised trust) are stable despite variation in the Level 2 characteristics (testing research question 2).

When developing the models it is important to be mindful of the potential for multicollinearity amongst the predictor variables. This may be a particular problem at Level 2 (the level of society): since wealthy countries tend to be less corrupt and to have more effective governments, it is possible that to include more than one of these variables in a single model would equate to including the same predictor variable twice. This would interfere with the estimation of the strength of the relationships between predictor and outcome variables, resulting in unreliable coefficients. In the next section I describe the process of generating my multilevel models.

4.2.3.1 Generating the multilevel models

This multilevel analysis splits the variance in generalised trust into variance at the individual level (Level 1) and at the country/ society level (Level 2). While both random intercept and random slopes models examine the proportion of variance explained at each level, in random intercept models these effects are held constant across all countries. In random slopes models, the relationships between the predictor variables (Level 1) and the outcome measure can be permitted to vary across groups (Level 2; in this instance, cross-nationally).

I use the bottom-up method of model building, which means that I begin with a small set of predictor variables and add more in stages. This allows me to monitor

any changes that occur as new variables are added to the model and reduces the risk of ignoring a variable that appears to have a non-significant association with trust due to the presence of a moderating variable.

I begin with the ‘null’ model (Model 0), which predicts the generalised trust score using only the constant and the residual (‘error’) terms:

$$ppltrst_{ij} = \beta_0 \cdot cons_{ij} + u_{0j} + e_{0ij}$$

Equation 4.1a: Model 0

β_0 tells me the average level of generalised trust across all subjects, while u_{0j} indicates the amount of unexplained variance in generalised trust at the country-level (Level 2) and e_{0ij} the amount of unexplained variance at the individual-level (Level 1).

Random intercepts models

The next set of models are random intercepts models, which investigate whether there is a significant association between human values and generalised trust. These models hold the relationship between values and trust constant and, when the country-level variables are added (Level 2), simply report the relationship between each predictor variable (at Level 1 and Level 2) and generalised trust.

$$ppltrst_{ij} = \beta_{0ij}.cons + \beta_2.(C2uniben - gm)_{ij} + \beta_1.(Csec - gm)_{ij} \\ + \beta_3.(C2contra - gm)_{ij}$$

Equation 4.1b: Model 1

The first experimental model (Model 1) looks only at the key individual-level (Level 1) variables. The subscript “*i*” indicates variance at the individual level, while the subscript “*j*” indicates the society level: the subscript “*ij*” refers to “person *i* in society *j*”. This model includes only the values constructs that are theorised to be relevant to generalised trust: (Need for) Security, Universalism, Benevolence, Conformity and Tradition. However, for methodological reasons these constructs have undergone some respecification: Davidov’s (2010) analysis of the factor structure of the HVS variables from Round 3 of the European Social Survey indicates that rather than including all five values as independent variables in the model, it would be more appropriate to group Universalism and Benevolence (thus forming their higher-order value, Self-transcendence; see Figure 3.1), and to group Conformity and Tradition. This results in three (rather than five) values constructs being added to Model 1, with Security, Self-transcendence and Conformity/Tradition the only predictors.³³

Model 2 adds the demographic variables age, gender and education, while Model 3 adds financial insecurity.

³³ The “-gm” alongside each predictor in Model 1 means “minus grand mean” and indicates that these scores have been centred using the mean score across all respondents in that society/ country.

$$\begin{aligned}
ppltrst_{ij} = & \beta_{0ij}.cons + \beta_1.Age\ 15 - 24_{ij} + \beta_2.Age\ 25 - 49_{ij} \\
& + \beta_3.Age\ 50 - 64_{ij} + \beta_4.Female_{ij} + \beta_5.ISCED\ 0 - 1_{ij} \\
& + \beta_6.ISCED\ 2_{ij} + \beta_7.ISCED\ 3_{ij} + \beta_8.Coping\ on\ present\ income_{ij} \\
& + \beta_9.Difficult\ on\ present\ income_{ij} \\
& + \beta_{10}.Very\ difficult\ on\ present\ income_{ij} \\
& + \beta_{11}.(C2uniben - gm)_{ij} + \beta_{12}.(Csec - gm)_{ij} \\
& + \beta_{13}.(C2contra - gm)_{ij} + \beta_{14}.Gini_j
\end{aligned}$$

Equation 4.1c: Model 4

Models 4 (Equation 4.1c above) and 5 test the impact of the two society-level variables on trust: Model 4 tests the effect of income inequality, and Model 5 tests the effect of corruption. Model 6 includes both of these Level 2 variables.³⁴

Plotting each human values construct against predicted trust scores

To offer an initial evaluation of the relevance of random slopes models, I plot for each country the relationship between each values construct and the predicted mean generalised trust score. This allows me to compare the slopes cross-nationally and to evaluate the need for further analysis: if there is no apparent difference in the slopes, then there would be little purpose in performing the random slopes analysis. The predicted trust scores are generated on the basis of the constant plus the centred value as shown below in Equations 4.2a – c.

³⁴ Due to extremely strong correlations between three of the four Level 2 variables, I include only two of these society-level variables in the analyses (see Section 4.3.2).

$$\widehat{ppltrst}_{ij} = \hat{\beta}_{0j}cons + \hat{\beta}_{13j}(C2uniben - gm)_{ij}$$

Equation 4.2a: Trust and Self-transcendence

$$\widehat{ppltrst}_{ij} = \hat{\beta}_{0j}cons + \hat{\beta}_{12j}(Csec - gm)_{ij}$$

Equation 4.2b: Trust and (Need for) Security

$$\widehat{ppltrst}_{ij} = \hat{\beta}_{0j}cons + \hat{\beta}_{14j}(C2contra - gm)_{ij}$$

Equation 4.2c: Trust and Conformity/ Tradition

Random slopes models

Assuming that the proportion of variance at Level 2 indicates a possible need for random slopes analysis, I then use random slopes models to examine the cross-national stability of the relationships between generalised trust and human values. Here, the slope (in the graphed relationship between each HVS construct and generalised trust) is allowed to vary; finding statistically significant variation in these slopes would indicate that the relationship between the predictor variable (the HVS construct) and outcome variable (trust) is not consistent cross-nationally.

As my key predictor variables, I allow only the HVS constructs to show variation in their regression slopes. In addition to giving a beta coefficient for each predictor variable, random slopes analysis generates two matrices of coefficients which report the variance in the slopes of these relationships as well as the covariance between their intercept and slope. This covariance indicates the pattern of slopes across the whole sample; for example, a positive covariance would indicate that the countries

with the largest intercepts also have the steepest slopes, while a negative covariance would indicate that the countries with the smallest intercepts have the steepest slopes. A covariance close to zero would indicate no particular pattern.

The random slopes models would mirror the random intercept models described above, for example:

$$ppltrst_{ij} = \beta_{0ij} \cdot cons + \beta_{2ij} \cdot (C2uniben - gm)_{ij} + \beta_{1ij} \cdot (Csec - gm)_{ij} \\ + \beta_{3ij} \cdot (C2contra - gm)_{ij}$$

Equation 4.3a: Model 1 RS

Here, the “*ij*” subscript to the β -coefficients indicates that they are subject to random variance at both the individual-level (Level 1) and society-level (Level 2). A significant degree of society-level variance, for any one human values construct, would indicate that the relationship between this construct and generalised trust differs cross-nationally.

4.3 Results and Discussion

Here I discuss the findings from my analyses. I first look at the characteristics of the sample, and then the distribution of scores on the dependent variable and the various individual-level predictor variables. In doing so, I look for trends that indicate the nature of the relationship between generalised trust and each predictor

variable. I then examine the correlation between each predictor variable and generalised trust, before presenting the results of the multilevel analysis.

4.3.1 Descriptive analyses

4.3.1.1 The sample

It is important to consider whether the sample used in this study is representative of the general population, because a non-representative sample may give context to the results. Here I first describe the range of countries, before examining the composition of each country's sample in comparison to the figures held by Eurostat.

Country My analyses use data from twenty countries: Austria, Belgium, Bulgaria, Switzerland, Denmark, Spain, Finland, France, Germany, Hungary, Ireland, the Netherlands, Norway, Poland, Portugal, Russia, Sweden, Slovenia, the Ukraine and the United Kingdom. As noted earlier, five countries were excluded from this study due to a lack of design weights (Latvia and Romania) and due to a contrary factor structure in Davidov's (2010) investigation of Schwartz's Human Values Scale (Cyprus, Estonia and Slovakia).

Age In order to compare the age distributions, some adjustment to the ESS data was necessary. Eurostat provides age distributions for each country (ages 15 – 24, 25 – 49, 50 – 64 and 65 years and above) as a proportion of the total population, while

the ESS samples only those aged 15 and above (so the distributions taken from within the ESS sample will necessarily be as a proportion of the population aged 15 years and above, rather than of the entire population of that country).

The ESS sample for each country was drawn from the same population as the Eurostat data, so I have assumed that the proportion of the population aged 0 – 14 would be the same. I therefore scaled-down the proportion of respondents to the ESS within each age category in order to account for the missing 0 – 14 year olds and permit comparisons with the proportions reported in the Eurostat dataset.

As shown in Appendix 4A.1, the age distribution within the ESS sample is comparable to that reported by Eurostat; it is broadly representative of the general population in each country and in most cases each age category is only up to a few percentage points different. Exceptions to this are a slight overrepresentation (in the ESS sample) of working age adults in France (6% higher than Eurostat) and of young people in Austria (8% higher, with a corresponding underrepresentation of older adults).

Gender It was not possible to obtain Eurostat figures for the gender ratio in each country. However, as can be seen in Appendix 4A.1, in each case 40-50% of the sample are male.

Education The education data supplied by Eurostat describe the proportion of 25 – 64 year olds who are educated to ISCED 3 and above. Extracting the corresponding

data from the ESS indicates that while in most countries (Austria, Bulgaria, Switzerland, Denmark, Spain, Finland, Hungary, Ireland, Poland, Portugal, Sweden and Slovenia) the ESS sample appears approximately representative of the general population, in four countries (Belgium, Germany, France and Norway) the ESS over-represents people with this level of education, and in two (the United Kingdom and the Netherlands) this educational group are under-represented.³⁵

Financial insecurity In each country, 5.7 – 78.5% of the sample reported finding it ‘difficult’ or ‘very difficult’ to manage on their current household income (see Figure 4.1).

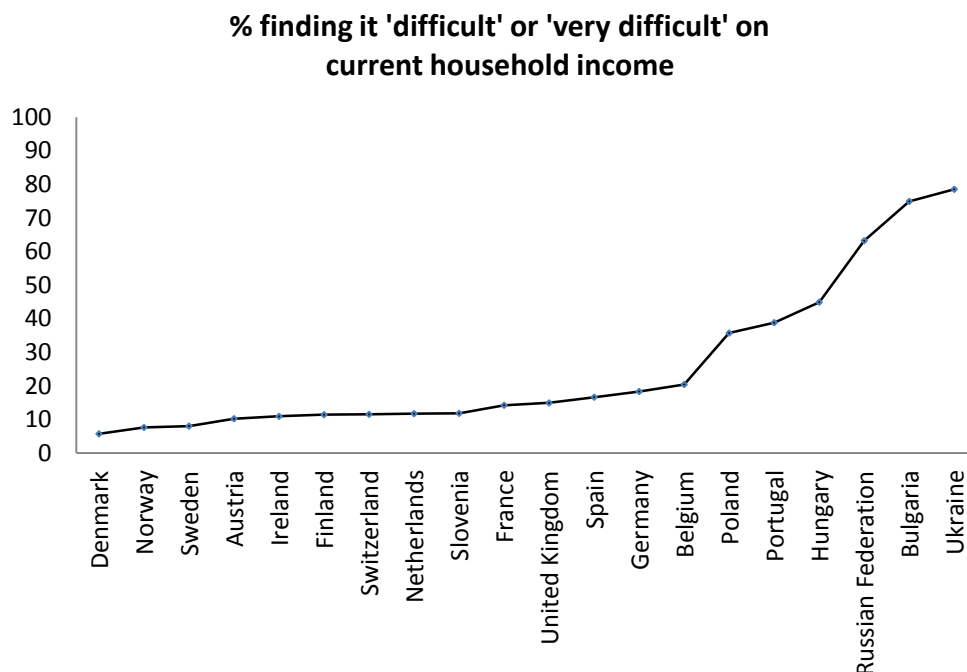


Figure 4.1: Proportion of respondents who report finding it ‘difficult’ or ‘very difficult’ to cope on their current household income

³⁵ These data were not available via Eurostat for the Russian Federation and Ukraine.

It is worth noting that with the ends of the scale largely polarised into Western Europe (lefthand side) and Eastern Europe (righthand side), it may be difficult to distinguish the effects of income versus the effects of the characteristics of the society.

4.3.1.2 Dependent variable

As noted above, respondents rated their level of trust on an eleven-point scale where 0 indicated “You cannot be too careful” and 10 indicated “Most people can be trusted”. Aggregate levels of trust range from 7.05 (SD = 2.07; Denmark) to 3.39 (SD = 2.77; Bulgaria) and the mean level of generalised trust across all countries is 5.02. The five highest aggregate GTQ scores belong to countries in Northern Europe, while of the five lowest scores one belongs to Portugal and the remainder to countries in Eastern Europe. As would be expected across this range of countries, there is cross-national variation in levels of generalised trust (see Appendix 4A.2).

The four graphs in Figure 4.2 display the mean trust scores cross-nationally, with countries listed in order of decreasing GDP, increasing income inequality, increasing corruption and decreasing government effectiveness. I have omitted the country names because the important thing for us to note from these graphs is the slope: the relationship between the Level 2 variable and generalised trust. In each case, I would expect the level of trust to follow a downward trajectory to mirror the theorised deterioration in the quality of societal conditions. While the slopes are by

no means perfectly smooth, a downward slope is demonstrated for three of the four society-level indicators: corruption, government effectiveness and GDP.

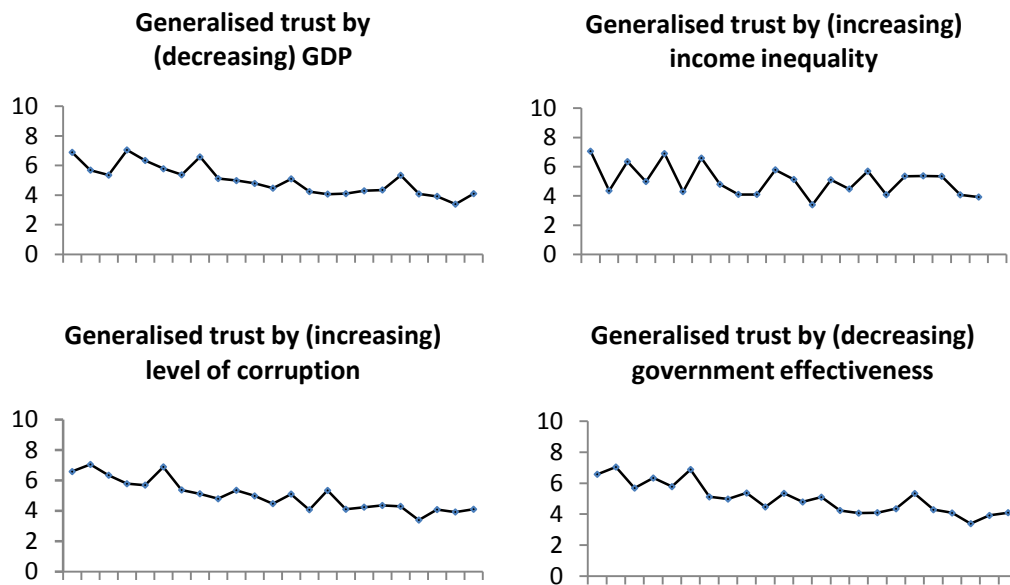


Figure 4.2a – d (clockwise from top left): The pattern of generalised trust by GDP, income inequality, corruption and government effectiveness

4.3.1.3 Human values

Prioritisation of the Schwartz human values constructs does vary cross-nationally. It is clear from Figure 4.3 that Self-transcendence and Security are generally awarded above-average priority and almost always prioritised above Conformity/ Tradition. In general, Security and Conformity/ Tradition are afforded higher importance in countries that have lower GDP, while Self-transcendence undergoes a drop in prioritisation as GDP decreases.

As noted earlier, respondents' scores on each value construct were generated by subtracting their own mean score (across Schwartz's ten HVS values) from their raw score on each value. This means that if someone scored 3 on Security, but their overall mean score was 3.5, then this person's value priority for Security would be -.5. With 'average priority' now being set at zero, a score of -.5 tells us that this person affords Security slightly below-average priority.

Figure 4.3 shows the mean value priority afforded each HVS construct (those included in this study: Self-transcendence, Security and Conformity/ Tradition) by the respondents in each country. For example, Norway's score of zero for Conformity/ Tradition tells us that, on average, respondents in Norway afford Conformity/ Tradition average priority (in relation to the full set of values measured in Schwartz's HVS). Moving higher up the chart, Norway scores .20 for Security and approximately .70 for Self-transcendence. These figures tell us that, on average, respondents in Norway give these latter two values higher priority than Conformity/ Tradition and prioritise Self-transcendence above both Security and Conformity/ Tradition.

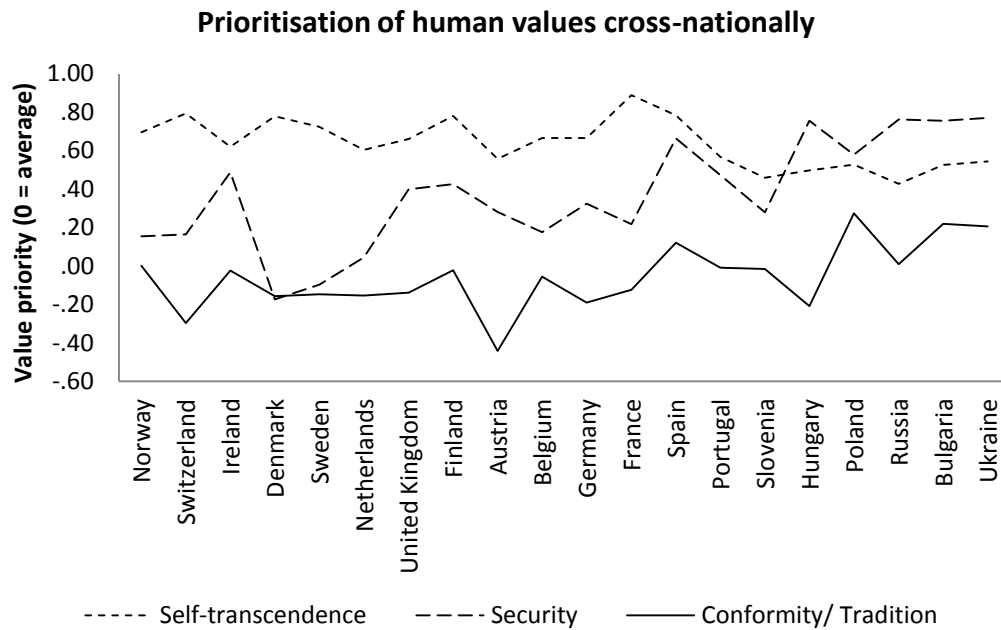


Figure 4.3: A score of 0 would indicate average priority; scores shown indicate the degree to which, across the sample, each value is given above- or below-average priority (countries in order of decreasing GDP)

In general we see in Figure 4.3 that while in wealthier countries Self-transcendence is afforded the highest priority, there comes a point at which the subjective importance of Self-transcendence drops and the importance of Security rises – in the least wealthy of the countries sampled, Security is more highly valued than Self-transcendence.

4.3.1.4 Human values and generalised trust

We have seen that both trust and values vary cross-nationally in the raw data. In Figures 4.4a and 4.4b, respectively, we see a possibility for support for hypotheses 1

and 2: that the prioritisation of Self-transcendence values is to some extent associated with a higher level of generalised trust (*hypothesis 1*), and prioritisation of Security is (to some extent) associated with a lower level of trust (*hypothesis 2*). *Research question 1* asks whether prioritising Conformity and Tradition values is associated with a lower level of generalised trust; the raw data do show an overall downward trajectory, however this may be rather weak. These observations reflect the correlation coefficients obtained for these pairings: across the sample, Self-transcendence correlates with generalised trust at $r = .12$, Security at $r = -.20$ and Conformity/ Tradition at $r = -.08$.

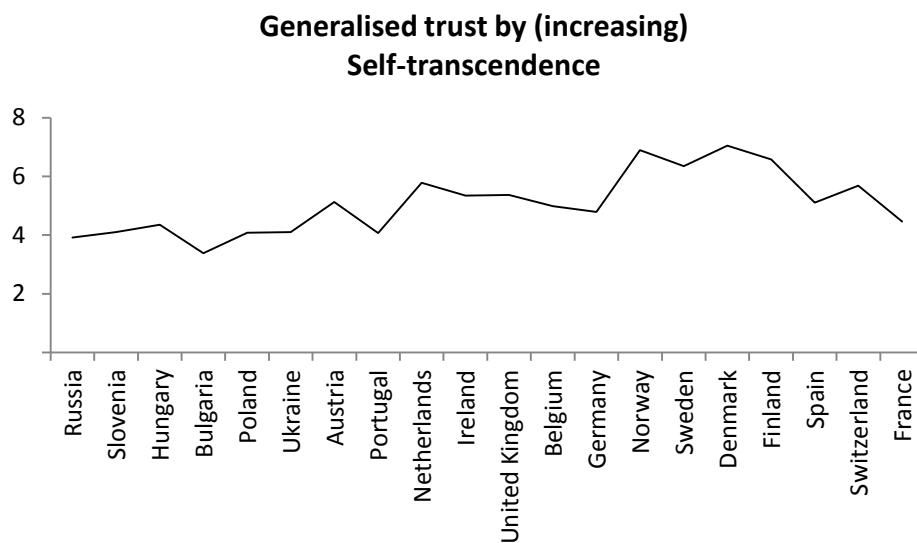


Figure 4.4a: Average generalised trust score cross-nationally (countries in order of increasing mean prioritisation of Self-transcendence)

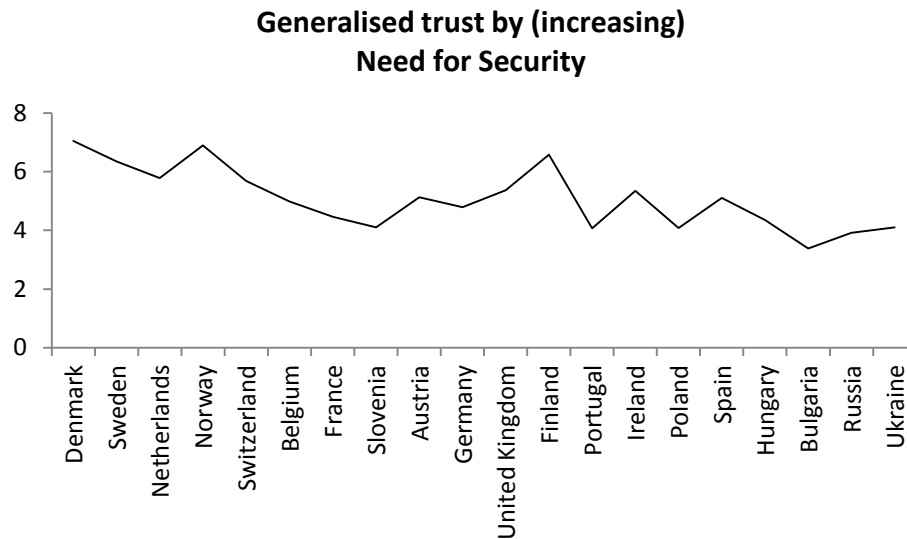


Figure 4.4b: Average generalised trust score cross-nationally (countries in order of increasing mean prioritisation of Security)

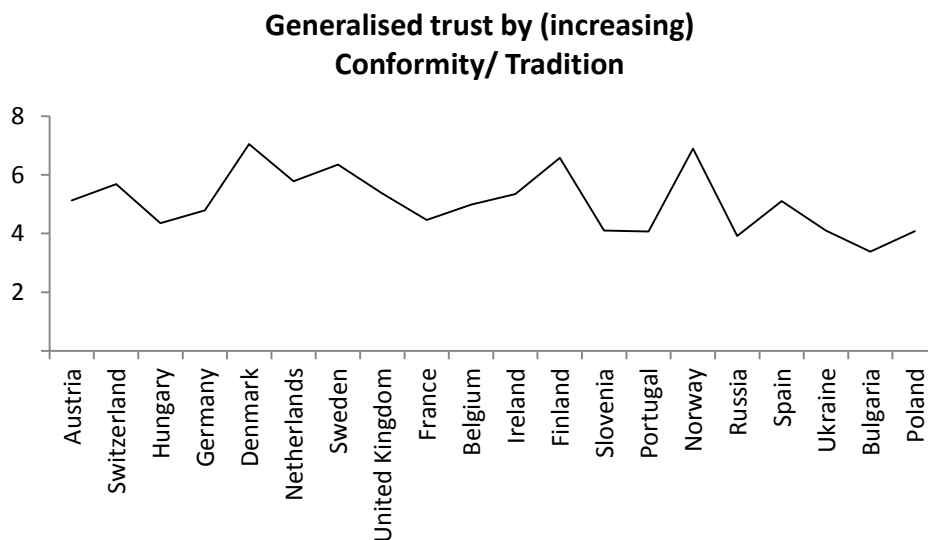


Figure 4.4c: Average generalised trust score cross-nationally (countries in order of increasing mean prioritisation of Conformity/ Tradition)

The descriptive data suggest a degree of support for my hypotheses. Before constructing the multilevel models it is important to check that there are no

indications of multicollinearity between the potential predictor variables: a strong correlation ($r \geq .8$ or $.9$) between two or more predictor variables would destabilise the model and may generate unreliable coefficients (Field, 2000).

4.3.2 Correlations

A two-tailed Pearson correlation (pairwise exclusion) reveals moderate correlations amongst the human values constructs at Level 1 (the individual-level).^{36,37} At Level 2 (the society-level), three of the country-level variables are very highly correlated: GDP per capita, Corruption and Government Effectiveness. In each case, the correlation is between .88 and .97 ($p < .01$), indicating a strong likelihood of multicollinearity in the event that more than one of these variables were included in the model. Their extremely high correlations also indicate that there is little point testing the influence of more than one of these on generalised trust or on the relationship between values and trust, because they should all have a similar effect. With correlations of .97 (Government Effectiveness) and .90 (GDP per capita), Corruption demonstrates the strongest associations with the other two variables; I therefore retain this measure in my models. The Gini coefficient for income inequality achieves more modest correlations with the other Level 2 variables,

³⁶ The correlation between Conformity/ Tradition and Openness does support the expectation noted in footnote 1: At $r = -.65$, it indicates a strong negative association, reflecting these constructs' opposing placements in Schwartz's quasi-circular structure. While this correlation is not high enough to indicate multicollinearity, including both constructs in the model would be likely to render one of them insignificant.

³⁷ As discussed in Section 2.4.2, the socio-demographic variables do show significant correlations with the human values items – in fact, the values items correlate more strongly with these 'control' variables than they do with generalised trust (see Appendix 4B).

ranging from $r = -.27$ ($p < .001$, with GDP per capita) to $r = -.35$ ($p < .001$, with Government Effectiveness). My two Level 2 variables are therefore Corruption and Income Inequality.

Below, I outline my findings from the multilevel models and examine the degree of support evidenced for the hypotheses outlined in Sections 4.1.1.4 and 4.1.2.4.

4.3.3 The null model and calculating the intraclass correlation coefficient

$$ppltrst_{ij} = 5.077(0.230) + u_{0j} + e_{0ij}$$

$$\sigma_u^2 = 1.055 (0.254)$$

$$\sigma_e^2 = 5.333 (0.293)$$

Equation 4.2: Null model

$$\rho = \frac{\sigma_u^2}{\sigma_u^2 + \sigma_e^2}$$

Equation 4.3: Calculating ρ , the intraclass correlation coefficient

Calculation of Equation 4.3, using the coefficients obtained in Equation 4.2, results in an intraclass correlation coefficient (ICC) of $\rho = .165$. This indicates that the majority of the variance in generalised trust scores is within countries (i.e. at Level 1, between individuals) and around 16.5% of the variance in trust is attributable to the

society in which the individual lives (Level 2). While this may not be wholly accurate (Nezlek, 2008), it does support the likelihood of between-country variation in levels of self-reported generalised trust and warrants investigation via multi-level modelling (NSD, 2013c).

4.3.4 Random intercepts models

In this section I present the coefficients from my random intercept models (Table 4.3) and respond to my hypotheses and research questions regarding the extent to which Schwartz's human values and the characteristics of society predict generalised trust.

Table 4.3: Results of random intercepts models (dependent variable: Generalised trust)

	0	1	2	3	4	(4)	5	(5)	6	(6)
	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)
Values										
Self-transcendence		.36 (.05)	.35 (.05)	.37 (.05)	.37 (.05)	.36 (.05)	.37 (.05)	.36 (.05)	.37 (.05)	.36 (.05)
(Need for) Security		-.34 (.03)	-.29 (.03)	-.27 (.03)	-.27 (.03)	-.34 (.03)	-.27 (.03)	-.34 (.03)	-.27 (.03)	-.34 (.03)
Conformity/ Tradition		-.10 (.03)	-.05 (.03)	-.04 (.03)	-.04 (.03)	-.10 (.03)	-.04 (.03)	-.10 (.03)	-.04 (.03)	-.10 (.03)
Demographics										
Age: 15-24			.09 (.10)	.05 (.09)	.05 (.09)		.05 (.09)		.05 (.09)	
Age: 25-49			-.09 (.07)	-.06 (.07)	-.05 (.07)		-.06 (.07)		-.06 (.07)	
Age: 50-64			-.13 (.05)	-.11 (.05)	-.11 (.05)		-.11 (.05)		-.11 (.05)	
Gender: female			-.07 (.03)	-.05 (.03)	-.05 (.03)		-.05 (.03)		-.05 (.03)	
Education: ISCED 0-1			-.67 (.10)	-.49 (.09)	-.49 (.09)		-.50 (.09)		-.50 (.09)	
Education: ISCED 2			-.71 (.07)	-.59 (.06)	-.59 (.06)		-.59 (.06)		-.59 (.06)	
Education: ISCED 3			-.50 (.07)	-.42 (.06)	-.42 (.06)		-.42 (.06)		-.43 (.06)	
Finance: Coping				-.40 (.04)	-.40 (.04)		-.40 (.04)		-.40 (.04)	
Finance: Difficult				-.74 (.08)	-.74 (.08)		-.73 (.08)		-.73 (.08)	
Finance: Very difficult				-1.06 (.11)	-1.06 (.11)		-1.06 (.11)		-1.06 (.11)	
Contextual variables										
Gini coefficient					-.08 (.03)	-.09 (.04)			-.04 (.02)	-.04 (.02)
Corruption (CPI)							.28 (.05)	.34 (.06)	.25 (.05)	.31 (.05)
Constant	5.08 (.23)	5.07 (.21)	5.58 (.23)	5.87 (.20)	8.40 (1.02)	7.91 (1.20)	3.94 (.36)	2.73 (.42)	5.44 (.68)	4.23 (.83)
u_{0j}	1.06 (.25)	.86 (.21)	.84 (.20)	.63 (.16)	.48 (.09)	.67 (.12)	.25 (.06)	.29 (.07)	.22 (.05)	.26 (.05)
e_{0j}	5.33 (.29)	5.21 (.29)	5.13 (.30)	5.06 (.30)	5.06 (.30)	5.21 (.29)	5.06 (.30)	5.21 (.29)	5.06 (.30)	5.21 (.29)

Data source: European Social Survey Round 3. Weighting: design weight (raw weight from ESS3); Values items centred around their mean.

Reference categories: age – 64+; gender – male; education – ISCED 4+; financial comfort – living comfortably.

Coefficients in bold are significant at $p \leq .05$.

Hypothesis 1: Self-transcendence (combined Universalism and Benevolence values) will be positively associated with generalised trust

As can be seen in Model 1, Self-transcendence demonstrates a significant, positive association with generalised trust ($B = .36$, $SE = .05$; $p < .001$), with a unit increase in prioritisation of Self-transcendence associated with an increase of .36 in generalised trust score. This coefficient does not change when demographic variables are added to the model.

Hypothesis 2: Security will be negatively associated with generalised trust

Security demonstrates a significant, negative association with generalised trust ($B = -.34$, $SE = .03$; $p < .001$): a unit increase in the extent to which the respondent prioritises Security results in a .34 decrease in generalised trust score. Although the coefficient decreases slightly when demographic variables are added to the model, the result does not change.

Research question 1: Conformity/ Tradition will be negatively associated with generalised trust

When demographic variables are excluded from the model, Conformity/ Tradition shows a significant negative association with generalised trust ($B = -.10$, $SE = .03$, $p < .001$): a unit increase in Conformity/ Tradition being associated with a decrease of .10 in generalised trust. This effect is lost when age, gender and education are added to the model ($B = .05$, $SE = .03$; ns). With a significant negative correlation between

education and Conformity/ Tradition ($r = -.21$), the former may be concealing the effect.

Hypothesis 3: Corruption will be negatively associated with generalised trust

The nation's score on the corruption perceptions index (CPI) is significantly predictive of generalised trust. Controlling for demographic variables, a unit increase on the CPI scale (indicating less corruption) is associated with a .28 ($SE = .05$, $p < .001$) increase in generalised trust. Excluding demographics from the model does not change this finding, neither does including both Level 2 variables in the same model (Model 6).

Hypothesis 5: Income inequality will be negatively associated with generalised trust

The Gini coefficient for income inequality does significantly predict individuals' generalised trust ($B = -.08$, $SE = .03$; $p < .01$): a unit increase in income inequality being associated with a drop of .08 in generalised trust. This does not change when demographic variables are removed from the model, nor when both Level 2 variables are included. However, accounting for both Level 2 variables and excluding the demographic variables does render this coefficient non-significant.

Hypotheses 4 and 6: GDP and government effectiveness will be positively associated with generalised trust

Due to extremely high correlations with the corruption variable, these items were excluded from the analysis. However, given their strong, positive association with

corruption it is possible to report that had I tested them these hypotheses would have been supported.

Summary of findings from random intercept models

Although MLwiN presents unstandardised coefficients, those for the values constructs may be directly compared because these items were scored on the same measurement scale. Need for Security and Self-transcendence are the strongest drivers of generalised trust, with a weaker (but still significant) association for Conformity/ Tradition. These results replicate those of Reeskens (2009).

While each of the human values constructs demonstrates a statistically significant relationship with generalised trust, it is worth noting that the sample size for these analyses is 35,728 across 20 countries. The significance of these results may therefore be led by the sample size.

4.3.5 Cross-national stability of the relationships between values and generalised trust

As noted in Chapter 3, values are driven by a combination of internal and external influences. Similarly to one's level of generalised trust, one's values may be sensitive to the immediate social environment as well as the broader societal context.

However, it is not yet clear whether any such influence occurs in tandem – affecting both values and trust so that their relatedness to each other is maintained – or if these influences may alter the relationships between values and trust.

Before running random slopes models to test the cross-national stability of these relationships, I used three models (in which generalised trust was defined only by the constant and each value construct) to generate predicted generalised trust scores for each score on the values constructs (see Equations 4.4a – c).

Plotting trust against the relevant value provides us with an illustration of their predicted relationship for each country in the sample. The resulting graphs are shown in Figures 4.5a – 4.5c below. An initial glance at the graphs suggests that there are no strong patterns in the covariances, and that the relationships between Self-transcendence and trust, and Security and trust, are very similar across the different countries with only a few exceptions: In Figure 4.5a, Portugal shows a neutral relationship between prioritisation of Self-transcendence values and trust while in all other countries this association is positive. In Figure 4.5b, there are two cases that stand out as being slightly different to the others: Norway, for which there appears to be very little effect of Security on trust and Belgium, which shows a steeper downward slope (i.e. a stronger negative relationship between trust and Security) than the other countries.

In Figure 4.5c, there is some variation in the association between Conformity/ Tradition and trust – in some countries the relationship is negative, while in others it is neutral or even verging on being positive.

The reason for the findings in Figure 4.5c is not immediately clear. For certain countries, such as Norway, Denmark, Ireland and the United Kingdom the effect of Conformity/ Tradition on trust appears neutral (a virtually horizontal line). For others, such as Finland, Belgium, Ukraine, Portugal and Russia there is a positive effect. In the remaining countries, prioritisation of Conformity/ Tradition has a negative association with trust, which appears strongest in Poland. These differences may be due to the different meanings of conformity and tradition in each country: in Norway, for example, conformity would indicate adherence to a very different set of social norms than it would in Russia. It may also depend upon who prioritises these values in each country: if these values are prioritised mainly by groups who are more or less trusting anyway, then the association may be coincidental rather than causal. For example, if in a particular country Conformity/ Tradition is mainly prioritised by older adults, who may on average be less trusting than working age adults, then the observation that prioritising Conformity/ Tradition is associated with a lower level of trust may be coincidental.

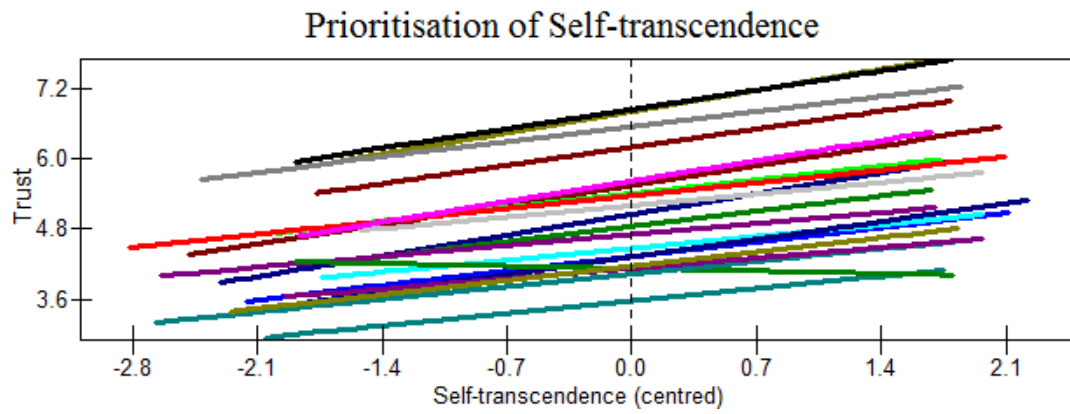


Figure 4.5a: Predicted relationships between generalised trust and prioritisation of Self-transcendence values

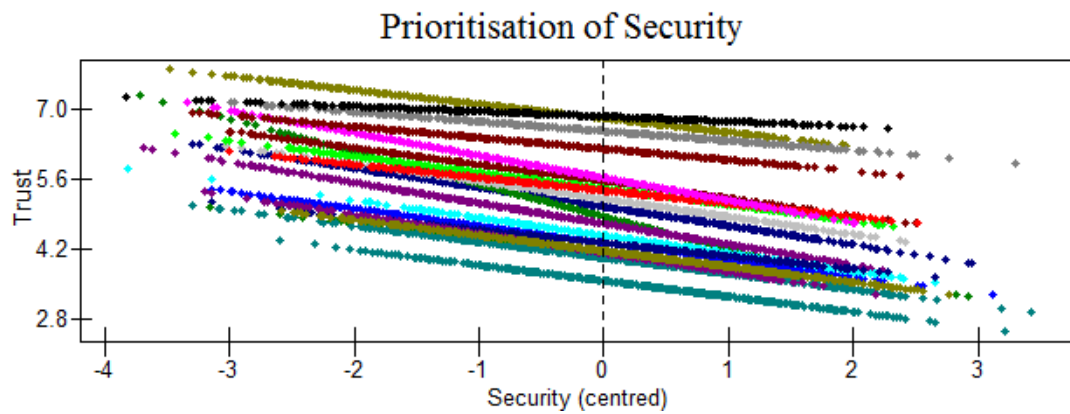


Figure 4.5b: Predicted relationships between generalised trust and prioritisation of Security values

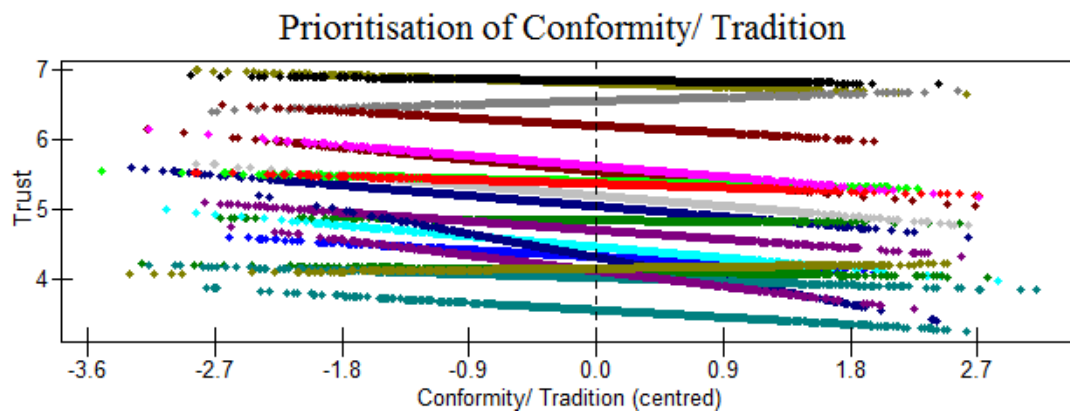


Figure 4.5c: Predicted relationships between generalised trust and prioritisation of Conformity/ Tradition values

It appears as though the association between Security and trust, and between Self-transcendence and trust, should be very similar cross-nationally – with the exception of the few countries mentioned. The relationship between Conformity/ Tradition and trust is less consistent and there may be significant differences between countries. As indicated in Equations 4.3a – c above, these charts have been generated using very simplistic models and it is possible that accounting for the effects of socio-demographic variables will influence the relationships between the values constructs and generalised trust. In addition, the variation in slopes observed in Figures 4.5a – c is often rather small; it is possible these differences will not reach statistical significance. I therefore run a series of random slopes models that parallel the random intercepts models described in Table 4.4, to test whether the apparent cross-national similarities and differences outlined above remain.

4.3.5.1 Random slopes models

Research question 2: Are the relationships between human values and trust stable cross-nationally?

Rows $U_{\text{SELF-TRANSCENDENCE}_j}$, U_{SECURITY_j} and $U_{\text{CONFORMITY/TRADITION}_j}$ in Table 4.4 below show the coefficients obtained when the effect of each HVS construct (i.e. the relationship between each values construct and generalised trust) is allowed to vary cross-nationally. A significant coefficient would indicate that the relationship between the HVS construct (e.g. Self-transcendence) and generalised trust varies between countries. The results show that these relationships are largely stable, with none of

the values constructs reporting significant cross-national variation in their association with generalised trust. However, when accounting for demographic variables the coefficient for Conformity/ Tradition is borderline significant ($B = .01$, $SE = .01$; $p = .058$). This indicates that the relationship between Conformity/ Tradition and trust does tend towards slight cross-national variation.

As noted earlier (Section 4.3.5), cross-national variation in the relationship between trust and Conformity/ Tradition may occur due to the different interpretations of this human value in different countries: in more progressive societies this may be interpreted as conforming to light-touch expectations regarding social norms and being considerate to others' beliefs, while in less progressive societies this may be interpreted as a government-enforced requirement to abide by strict codes of conduct.

The findings from these analyses do not support those reported by Reeskens (2009), who found that the effects of the values constructs do vary cross-nationally. This non-concordance may be due to differences in our use of control variables, different treatment of the values items, or our choice of outcome measure (my use of the generalised trust question versus Reeskens' use of the social trust scale).

Table 4.4: Results of random slopes models (dependent variable: Generalised trust score)

	1	2	3	4	(4)	5	(5)	6	(6)
	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)
Values									
Self-transcendence	.36 (.04)	.35 (.04)	.36 (.05)	.36 (.05)	.36 (.04)	.36 (.05)	.36 (.04)	.36 (.05)	.36 (.04)
(Need for) Security	-.33 (.03)	-.27 (.03)	-.26 (.03)	-.26 (.03)	-.33 (.03)	-.26 (.03)	-.33 (.03)	-.26 (.03)	-.33 (.03)
Conformity/ Tradition	-.11 (.03)	-.06 (.03)	-.05 (.03)	-.05 (.03)	-.11 (.03)	-.05 (.03)	-.11 (.03)	<u>-.05 (.02)</u>	-.11 (.03)
Demographics									
Age: 15-24		.06 (.10)	.02 (.09)	.02 (.09)		.02 (.09)		.02 (.09)	
Age: 25-49		-.11 (.07)	-.07 (.07)	-.07 (.07)		-.07 (.07)		-.07 (.07)	
Age: 50-64		-.13 (.04)	-.12 (.05)	-.12 (.05)		-.12 (.05)		-.12 (.05)	
Gender: female		-.06 (.03)	-.04 (.03)	-.04 (.03)		-.04 (.03)		-.04 (.03)	
Education: ISCED 0-1		-.70 (.09)	-.53 (.09)	-.53 (.09)		-.54 (.08)		-.54 (.08)	
Education: ISCED 2		-.72 (.07)	-.60 (.06)	-.60 (.06)		-.60 (.06)		-.60 (.06)	
Education: ISCED 3		-.51 (.07)	-.44 (.06)	-.44 (.06)		-.44 (.06)		-.44 (.06)	
Finance: Coping			-.39 (.04)	-.39 (.04)		-.39 (.04)		-.39 (.04)	
Finance: Difficult			-.73 (.08)	-.73 (.08)		-.72 (.08)		-.73 (.08)	
Finance: Very difficult			-1.05 (.11)	-1.05 (.11)		-1.04 (.11)		-1.04 (.11)	
Contextual variables									
Gini coefficient				-.10 (.02)	-.10 (.02)			-.06 (.01)	-.05 (.01)
Corruption (CPI)						.26 (.04)	.30 (.04)	.22 (.04)	.26 (.04)
Constant	5.08 (.21)	5.61 (.23)	5.88 (.19)	8.94 (.66)	8.08 (.73)	4.08 (.33)	3.03 (.32)	6.15 (.48)	4.77 (.53)
u_{0j} (intercept)	.87 (.22)	.85 (.20)	.65 (.17)	.49 (.10)	.67 (.13)	.26 (.06)	.32 (.08)	.23 (.06)	.28 (.06)
$u_{\text{SELF-TRANSCENDENCE}j}$	.02 (.02)	.03 (.02)	.03 (.02)	.03 (.02)	.02 (.02)	.03 (.02)	.02 (.02)	.03 (.02)	.02 (.02)
$u_{\text{SECURITY}j}$	.02 (.01)	.02 (.01)	.01 (.01)	.01 (.01)	.02 (.01)	.01 (.01)	.02 (.01)	.01 (.01)	.02 (.01)
$u_{\text{CONFORMITY/TRADITION}j}$	.01 (.01)	.01 (.01)	<u>.01 (.01)</u>	<u>.01 (.01)</u>	.01 (.01)	<u>.01 (.01)</u>	.01 (.01)	<u>.01 (.01)</u>	.01 (.01)
e_{0j} (intercept)	4.71 (.30)	4.63 (.30)	4.57 (.30)	4.57 (.29)	4.71 (.30)	4.57 (.29)	4.71 (.30)	4.57 (.29)	4.71 (.30)
$e_{\text{SELF-TRANSCENDENCE}j}$	.49 (.13)	.46 (.13)	.46 (.13)	.46 (.13)	.48 (.13)	.45 (.13)	.48 (.13)	.46 (.13)	.48 (.13)
$e_{\text{SECURITY}j}$	.18 (.06)	.18 (.06)	.19 (.06)	.19 (.06)	.18 (.06)	.19 (.06)	.18 (.06)	.19 (.06)	.18 (.06)
$e_{\text{CONFORMITY/TRADITION}j}$	.37 (.06)	.37 (.06)	.35 (.06)	.35 (.06)	.37 (.06)	.35 (.06)	.37 (.06)	.35 (.06)	.37 (.06)

Data source: European Social Survey Round 3, weighted by design weight (raw weight from ESS3). Values items centred around their mean.

Reference categories: age – 64+; gender – male; education – ISCED 4+; financial comfort – living comfortably.

Coefficients in bold are significant at $p \leq .05$; underlined are borderline significant ($.05 \leq p \leq .06$).

4.4 Conclusions

The initial research questions posed by this study asked (1) whether values predict trust, and (2) whether the relationships between values and generalised trust vary cross-nationally. The results of the random intercepts analysis show that value priorities, as measured by Schwartz's HVS, are indeed predictive of generalised trust. More specifically, prioritisation of the egalitarian Self-transcendence values is associated with reporting a higher level of generalised trust, while prioritising Security (and perhaps Conformity/ Tradition) is associated with a lower level of trust. The egalitarian aspect may support Uslaner's (2002) theory that generalised trust is moralistic in nature, while both this and the finding regarding the Conservation values do appear to support the theory discussed above based on Graham et al.'s (2011) Moral Foundations Theory – that those who prioritise concern for the individual are likely to hold a more inclusive moral community and therefore likely to be more trusting.

The results of the random slopes analysis suggest that the relationships between values and generalised trust are generally consistent across the countries included in these analyses, although some variation may be present in the relation between Conformity/ Tradition and trust.

Following the theoretical connections between values and trust discussed in Section 4.1.1.2, it is tempting to argue for an alteration to Uslaner's theory: that is, that particularised trust is also moralistic, but that it relates to a moral concern for the protection of the community or society rather than of the individual. However, my results are not able to support this proposed alteration because I have no outcome measures that were designed to directly capture particularised trust.

Limitations of the present study and ideas for future research

The results obtained in this study are clearly different to those reported by Reeskens (2009). This may be due to my using the value priorities rather than the raw scores, my having used the combined values constructs indicated by Davidov (2010) or my simplification of the statistical models (Reeskens' analyses included a broader array of control variables). It would be interesting to replicate Reeskens' models using the derived value priorities, to test whether the treatment of these constructs is important (i.e. as single, raw values or the combined, 'centred' values identified by Davidov [2010]).

The status of particularised trust as a moral value would be worth considering for future investigation, perhaps by taking more detailed measures of trust and ideological orientation. This would permit a closer examination of the associations between ideology, human values and trust. Replicating these analyses on a broader range of measures may also distinguish between those who believe most people are

trustworthy but prioritise caution, versus those who believe most people cannot be trusted.

Overall conclusions

As mentioned earlier, there is a relative dearth of research into the individual-level drivers of generalised trust – those that are generally inherent to the individual, rather than being illustrative of ‘the individual within a social context’ (as would be the case with, for example, *social success and wellbeing theory*). The findings from the present study suggest that moral values are empirically and theoretically associated with generalised trust. Although the present study does not permit us to draw conclusions about the nature of generalised trust, we can conclude that its associations with certain values do appear to be universal in the samples tested here. Given that these data are drawn from representative population samples from 20 countries, these findings are generally encouraging.

Chapter 5

Testing Personality Theory: identifying the individual-level drivers of self-reported trust, behavioural trust and trustworthiness

5.1 Introduction

As discussed in previous chapters, generalised trust is the ‘thin’ trust that exists between strangers (Putnam, 2000). In Chapter 3 I examined the current state of the theoretical and substantive literature on generalised trust and found that while there has been a great deal of interest in the topic, little consensus has been reached regarding the aetiology of generalised trust. Theories of its origins cite (a) influences at the level of the individual, (b) the dynamic between the individual and their social environment, and (c) characteristics of the community or society in which the person lives. As described in Chapter 3, Delhey and Newton (2003) conducted analyses that attempted to pit theories at each level against each other. In doing so, they implemented relatively sound tests of the social and societal theories (types (b) and (c) above), but they left the individual-level theories (type (a)) somewhat underexposed. This parallels the broader literature on generalised trust, which largely focuses on theories that operate at the social and community levels.

The individual-level theories seek to account for one’s level of generalised trust by examining internal characteristics that are key to the person’s individuality: their values (Moral Foundations of Trust Theory; Uslaner, 2002) and their personality

traits (Personality Theory; Delhey & Newton, 2003). In Chapter 4 I sought to take a step towards remedying the inattention to Uslaner's theory of the moral foundations of trust by testing the predictive strength of Schwartz's (2001) human values model on a measure of self-reported generalised trust (the generalised trust question, or GTQ). I found that certain values do account for significant proportions of the variance in respondents' generalised trust score, and that this relationship is generally stable irrespective of the characteristics of the society in which the individual lives.³⁸

This chapter, in turn, tests Personality Theory. As described in Chapter 3, Personality Theory identifies the individual's disposition as central to determining their level of generalised trust. This idea is not new; trust is theorised to be a facet within the personality trait Agreeableness (McCrae and Costa, 1999), thus firmly locating it within the personality system. However, little research has tested the associations between personality and generalised trust.

Using data collected in an experimental context, I assess the extent to which personality traits and facets (as measured by McCrae and Costa's [2005] NEO-PI-3 questionnaire) predict the individual's level of self-reported generalised trust. Given the tendency observed in the literature for behaviour in the trust game to be held as a behavioural measure of generalised trust (and the conflicting findings regarding whether self-reported trust predicts behavioural trust or trustworthiness), I also test the extent to which personality predicts behavioural trust and trustworthiness.

³⁸ Characteristics such as the country's levels of income inequality and corruption.

The trust game is a two-player game in which Player 1 decides whether to invest a proportion of their monetary stake with Player 2; any amount invested is then multiplied by the experimenter and Player 2 decides how to split the money between themselves and Player 1. In the present study participants first complete a questionnaire and then return to the Lab a week later to play two rounds of the trust game.

The inclusion of the trust game in this study enables me to compare the predictors of self-reported trust with those of behavioural trust and trustworthiness. I hope to elaborate on the existing work that describes the predictors of these outcomes and, in doing so, to take some steps towards identifying what the generalised trust question (GTQ) measures and whether the trust game is an appropriate behavioural equivalent.

In Chapter 3 I discussed the measurement of personality and its associations with other constructs. I begin here by specifying my working definition of personality and describing the constructs measured by McCrae and Costa's (2005) NEO-PI-3.

5.1.1 Personality and its measurement

“... the dynamic organization within the individual of those psychophysical systems that determine his characteristic behavior and thought”

(Allport, 1961: 28)

“Important and relatively stable characteristics within a person that account for consistent patterns of behavior. Aspects of personality may be observable or unobservable, and conscious or unconscious”

(Ewen, 2010: 4)

Personality is the driving force behind the way we experience and respond to events. A defining characteristic is the consistency of these effects, which generally show a high degree of stability irrespective of context.

In Chapter 3 I briefly described the range of conceptualisations of personality and focussed in more detail on the trait perspective, which offers a way to measure personality and is oriented towards the assessment of personality in non-clinical populations (Ewen, 2010). Measurement instruments such as McCrae and Costa’s (2005) NEO-PI-3 make the measurement of personality straightforward as the individual is able to recognise their own psychological and behavioural tendencies and self-report the extent to which each description in the inventory applies to themselves.³⁹

³⁹ While there are a number of biases that may lead to inaccuracies in such measures, these apply to all self-report data so I do not discuss them here.

McCrae and Costa's (1999) Big Five traits are Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness, and each trait comprises six facets. For example, the trait Agreeableness comprises *trust*, *straightforwardness*, *altruism*, *compliance*, *modesty* and *tender-mindedness* (McCrae & Costa, 1999; see Table 5.1 for a description of each trait and a list of its facets). While the full NEO personality inventory measures all thirty facets, brief scales have been devised (including some by other researchers, such as the Big Five Inventory; John, 2007-9) that measure a subset of items – generally those that load most strongly on each trait.

Relating personality to a theory of the key drives of the human organism (DeYoung, Peterson, & Higgins, 2005), DeYoung, Peterson, and Higgins (2002) report that these five traits can be scaled down to two higher-order personality dimensions: Neuroticism, Agreeableness and Conscientiousness loading together on *Stability*, and Extraversion and Openness loading on *Plasticity*:

“Stability and Plasticity can be considered the manifestation in personality of two overarching concerns of any organism: (1) the need to maintain a stable physical/behavioral organization to achieve various goals and (2) the need to incorporate novel information into that organization, as the state of the organism changes both internally (developmentally) and externally (environmentally). As personality traits, Stability and Plasticity reflect individual differences in the emphasis on, competence in, and capacity for meeting each of these two general needs in the ways characteristic of human beings.”

(DeYoung et al., 2005: 828)

DeYoung et al.’s (2002) model offers an early insight into a feature of the five factor model that is not necessarily widely known, but will become clear by the end of this chapter: there are inter-trait associations at both the trait and facet level. With insights from social neuroscience, some of the shared variance is theorised to stem from the bio-chemical influences on personality such as the shared use of particular brain regions (e.g. DeYoung et al., 2002; DeYoung et al., 2005; Graziano & Tobin, 2013; Haas, Omura, Constable & Canli, 2007; Haas, Ishak, Denison, Anderson, & Filkowski, 2015).

Beyond its intuitive appeal, there do not appear to be any existing theories to account for why generalised trust should be rooted in personality. However, it is important to consider the possible theoretical relevance of personality to trust in order to ensure critical interpretation of the findings from this study and to avoid over-interpreting perhaps spurious statistical associations.

Table 5.1: Description of each trait in McCrae and Costa's (1999) Big Five

Trait	Description	Facets
Neuroticism	The general tendency to experience negative affects such as fear, sadness, embarrassment, anger, guilt, and disgust... men and women high in N are also prone to have irrational ideas, to be less able to control their impulses, and to cope more poorly with stress than others.	<i>Anxiety, angry hostility, depression, self-consciousness, impulsiveness, vulnerability</i>
Extraversion	In addition to liking people and preferring large groups and gatherings, extraverts are also assertive, active, and talkative. They like excitement and stimulation and tend to be cheerful in disposition. They are upbeat, energetic, and optimistic.	<i>Warmth, gregariousness, assertiveness, activity, excitement seeking, positive emotions</i>
Openness to Experience	Open individuals are curious about both inner and outer worlds, and their lives are experientially richer than those of closed individuals. They are willing to entertain novel ideas and unconventional values, and they experience both positive and negative emotions more keenly than do closed individuals.	<i>Fantasy, aesthetics, feelings, actions, ideas, values</i>
Agreeableness	The agreeable person is fundamentally altruistic. He or she is sympathetic to others and eager to help them, and believes that others will be equally helpful in return. By contrast, low scorers on A, disagreeable or antagonistic people, are egocentric, sceptical of others' intentions, and competitive rather than cooperative.	<i>Trust, straightforwardness, altruism, compliance, modesty, tender mindedness</i>
Conscientiousness	The conscientious individual is purposeful, strong-willed, and determined... high C scorers are scrupulous, punctual, and reliable. Low scorers are not necessarily lacking in moral principles, but they are less exacting in applying them, just as they are more lackadaisical in working toward their goals.	<i>Competence, order, dutifulness, achievement striving, self-discipline, deliberation</i>

Descriptive text quoted from McCrae & Costa, 2010: 19-21; facets taken from McCrae & Costa, 1999

Reproduced by special permission of the Publisher, Psychological Assessment Resources, Inc., 16204 North Florida Avenue, Lutz, Florida 33549, from the NEO Inventories Professional Manual by Paul T. Costa Jr., PhD and Robert R. McCrae, PhD, Copyright 2010 by Psychological Assessment Resources, Inc. (PAR). Further reproduction is prohibited without permission of PAR.

In the next section I briefly discuss the appropriateness of using the trust game as a behavioural measure of generalised trust. I then give an overview of Costa and McCrae's (1999) model of the interplay between personality traits and other internal characteristics of the individual. This model describes both the factors that they suspect drive personality and those that personality influences (see Figure 5.1). I then look in more detail at the possible underpinnings of personality before proposing a theoretical orientation for the relationship between two key personality traits and generalised trust.

5.1.2 Personality – its drivers and influence

Costa and McCrae (1999) discuss their theory regarding the interplay between personality and other key aspects of the individual. As shown in Figure 5.1, the five personality traits (Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness) are labelled 'basic tendencies' and these underpin the individual's values and the construction of the self. Personality traits are found to be heritable (see McCrae, Jang, Livesley, Riemann, & Angleitner, 2001) and generally stable across the lifecourse (John & Srivastava, 1999; although age-related changes in personality have been noted [e.g. McCrae, Martin, & Costa, 2005]), making a strong case for their identification as a foundation for the rest of the system (second only to the individual's biological endowment).

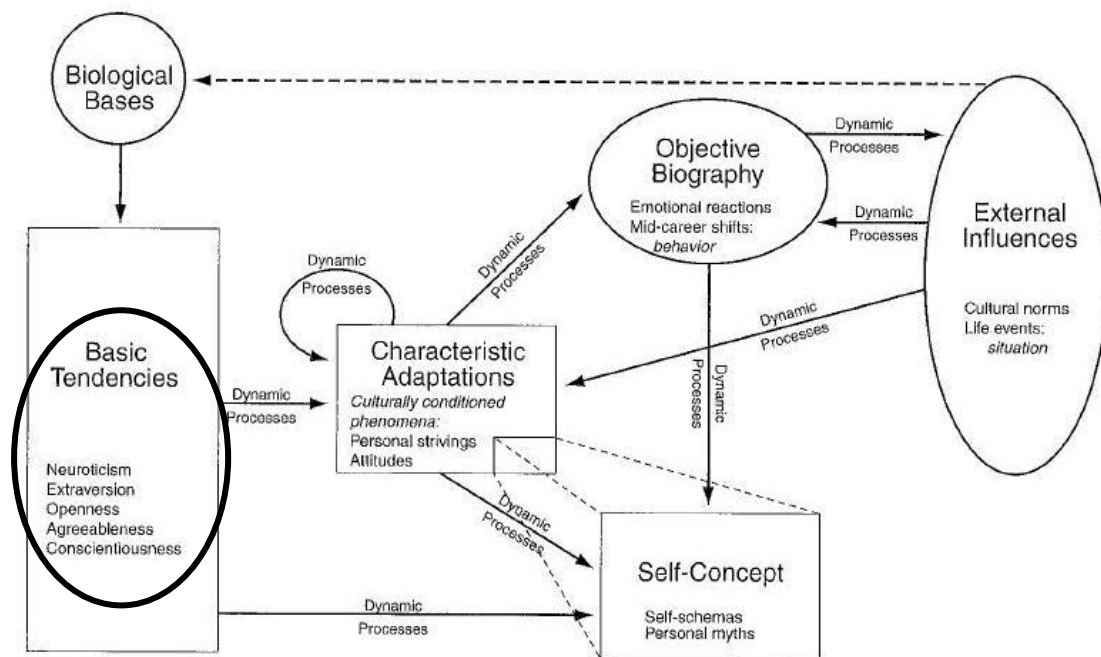


Figure 5.1: Costa and McCrae's (1999: 163) five-factor personality system (circle directing attention to the basic tendencies added by me). Figure taken from J. S Wiggins (Ed), *The five-factor model of personality*. Copyright © 1996 Guilford Publications Inc. Reprinted with permission of Guilford Press.

In Costa and McCrae's (1999) model, the individual's personality traits ('basic tendencies') and their values and attitudes ('characteristic adaptations') are depicted as the core of the personality system, while their biological makeup, as well as emotional and social factors are shown as associated influences. Personality traits are fed directly only by one's biological characteristics, and indirectly by 'external influences' such as life events. Events may alter the individual's biochemical balance (for example, a traumatic injury or illness may result in changes to one's neurological functioning or a change in medication, diet or activity levels may alter their hormone levels) and this in turn may produce changes in their personality. Self-reported

personality has also been found to vary with age, with particularly marked changes between the ages of 20 – 30 years (e.g. McCrae, Martin, et al., 2005).

While this study cannot even begin to unpick the ‘biopsychosocial’ factors that may drive one’s personality or one’s propensity for generalised trust, given the lack of a sound theoretical basis for Personality Theory it would be worthwhile to give some consideration to the mechanisms that may be in operation. First, however, I look at some findings from social neuroscience: does the brain offer any evidence for the existence of personality?

5.1.2.1 Neurological correlates with personality: the evidence

The theoretical associations outlined in Costa and McCrae’s (1999) model have been investigated in neurological studies: studies using functional magnetic resonance imaging (fMRI) have identified correlates between personality and structural differences in the brain, as well as neural activity both at rest and during processing tasks (e.g. DeYoung et al., 2010).

“Extraversion covaried with volume of... a brain region involved in processing reward information. Neuroticism covaried with volume of brain regions associated with threat, punishment, and negative affect. Agreeableness covaried with volume in regions that process information about the intentions and mental states of other individuals. Conscientiousness covaried with volume in lateral prefrontal cortex, a region involved in planning and the voluntary control of behavior.”

(DeYoung et al., 2010: 820)

DeYoung and colleagues (2010) report correlations between personality traits and brain mass in regions that have theoretical and functional associations with those traits (see also Gardini, Cloninger, & Venneri, 2009; Adelstein et al., 2011; Forbes et al., 2014). What is of course not clear is which came first: one may demonstrate particular personality attributes due to having more substantial brain mass in the relevant regions or, alternatively, brain mass in these regions may be more substantial due to the higher intensity workout they receive from an owner who has a particular personality configuration. In addition, it is not clear what proportion of the variance in personality is accounted for by neural structure. Irrespective of this, the findings from social neuroscience are encouraging in their support for the trait model of personality; a correspondence with objective measures lends credence to the notion that the constructs measured by the NEO personality inventory represent something tangible.

Evidence of the association between neurological activity and personality traits has been reported in a range of studies that have examined neurological activity at rest (e.g. Hahn, Gottschling, & Spinath, 2012; Kunisato et al., 2011; Aghajani et al., 2014) and during cognitive tasks designed to evoke particular responses (e.g. Hahn et al., 2009; Canli et al., 2001).

There appear to be some grounds on which to have confidence that the NEO personality inventory is measuring meaningful interpersonal differences. In the section below, I discuss some of the work that has postulated how personality develops. My discussion here is restricted to literature that uses the trait model of personality and specifically those traits modelled by McCrae and Costa (1999).

5.1.2.2 In theory: the drivers of personality

There are a number of theories that one could draw upon when contemplating the possible bases of personality, for example the mammalian emotion systems (Davis & Panksepp, 2011) and the postulated evolutionarily endowed motive systems (see Graziano & Tobin, 2013, for a review). While an analysis of the merits of these is beyond this chapter, the fields of personality psychology and social neuroscience offer a ready source of both theory and empirical findings that may give insight into the possible underpinnings not only of personality but also of the rationale for expecting personality to relate to one's proclivity for trust (and perhaps trustworthiness).

In this section, I give a brief overview of a possible mechanism via which personality may drive one's level of generalised trust. I begin with a description of approach and avoidance temperaments and their theorised relevance to the personality traits Neuroticism and Extraversion. I then examine the empirical evidence for these associations before discussing the possible implications for one's propensity for generalised trust. Clearly this does not encompass the full set of personality traits; the breadth of this discussion is necessarily limited by time constraints and the available literature.

5.1.2.3 Approach and avoidance temperaments

The Reinforcement Sensitivity Theory (RST) of personality identifies three systems of personality: the Behavioural Approach System (BAS), Behavioural Inhibition System (BIS; also known as Avoidance) and the Fight-Flight-Freeze-System (FFFS; Corr, 2008). Here I focus on the first two of these, as the much researched 'Approach' and 'Avoidance' temperaments, and their posited relationship to two of the Big Five personality traits.

“Functionally, approach and avoidance temperaments are construed as energizers and instigators of valence-based propensities; they are responsible for immediate affective, cognitive, and behavioral reactions to encountered or imagined stimuli.”

(Elliott & Thrash, 2008: 320)

Researchers have postulated that an ‘approach versus avoidance’ dichotomy underlies the individual’s scoring on Extraversion and Neuroticism (see Corr, 2004). It is suggested that one’s tendency towards approach versus avoidance is driven by the sensitivity of their neurological reward-processing system to reward versus punishment: a heightened (relatively speaking) sensitivity to reward encourages the bearer to approach stimuli that are expected to deliver positive outcomes, while a heightened sensitivity to punishment makes one more aware of potential negative outcomes and promotes the development of a cognitive and behavioural style that is oriented towards their avoidance.

Pickering and Corr (2008) offer an explanation of the place of personality traits in this process:

“RST is built upon a *state* description of neural systems and associated relatively short-term, emotions and behaviours, which, according to the theory, give rise to longer-term *trait* dispositions of emotion and behaviour. This theory argues that statistically defined personality factors are sources of variation that are stable over time and that derive from underlying properties of an individual; it is these, and current changes in the environment, that comprise the neuropsychological foundations of personality.”

(Pickering & Corr, 2008: 239)

Within this framework, personality traits are described as the measurable (or superficial) face of a complex set of interactions between neurological, biochemical, psychological and environmental factors.

The approach-avoidance model of behaviour notes that those who tend towards approach behaviours are more responsive to reward, while those who tend towards avoidance are less sensitive to rewards but more sensitive to punishment (Corr, 2008; Smillie, 2008; Simon et al., 2010). As explained by Corr (2004) these behavioural tendencies operate in parallel and combine to produce the resulting behavioural outcomes.

5.1.2.4 The RPS, and Neuroticism and Extraversion

Figure 5.2 below shows Smillie's (2008) model of the mechanisms via which reward and punishment sensitivity relate to Extraversion and Neuroticism (for alternative models see Corr, 2004; Carver, 2004; Depue & Collins, 1999. See Matthews, 2008, for a critique of RST).

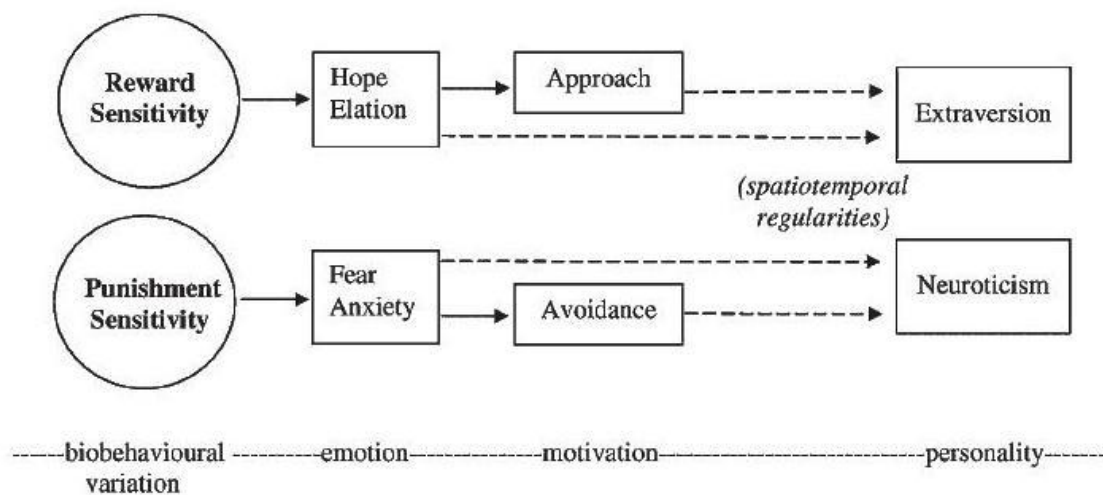


Figure 5.2: Smillie's (2008: 361) model of the process by which reinforcement sensitivity may influence personality traits. What is reinforcement sensitivity? Neuroscience paradigms for approach-avoidance process theories of personality/ Luke D Smillie/ European Journal of Personality Vol. 22. Copyright © 2008 John Wiley & Sons, Ltd.

Empirical findings from a range of studies support the theorised association between reward sensitivity and positive affect, and punishment sensitivity and negative affect in both neurological (e.g. Cohen, Young, Baek, Kessler, & Ranganath, 2005) and survey-based (e.g. Hundt et al., 2013; Segarra et al., 2007; Carver & White, 1994) studies.

Having established that personality may be driven by and influence the individual's biological, social, psychological and neurological assets, I turn now to examine some of the possible relationships between personality and trust.

5.1.3 Personality and trust-related outcomes

5.1.3.1 Personality and generalised trust: theoretical associations

In this section I draw on the above discussion to posit a theoretical standpoint regarding the purported relationship between personality and generalised trust. I then discuss the empirical findings presented in the existing literature.

The Approach/ Avoidance model may be a useful parallel to high versus low generalised trust: the person who is inclined to be trusting reaches out to the potential trustee with the hope (or perhaps expectation) of a positive outcome, while the person who is more inclined to be cautious holds back in order to avoid a negative outcome. Although betrayal is not 'punishment' per se, the aversive experience of betrayal is likely to be functionally equivalent to the aversive experience of overt punishment.

While the literature connecting personality to generalised trust is too sparse to permit extensive hypotheses, examination of the personality traits and facets within

McCrae and Costa's (1999) Big Five may indicate some likely candidates. This task is not entirely straightforward. Each trait is composed of six facets that seek to cover the full breadth of the personality trait, for example Extraversion holds both *warmth* and *assertiveness* – which in more extreme cases can lead to very different styles of interpersonal interaction. Whether each trait will demonstrate an association with trust will therefore depend upon the facets that have combined, for each person, to generate that high score. With this in mind, it is questionable whether we can reasonably expect entire traits to correspond with a measure such as generalised trust. However, given that there is a trend underlying each trait (e.g. perhaps 'confidence' for Extraversion, and 'niceness' for Agreeableness), it is worth investigating, and the results of prior studies are encouraging (see Section 5.1.3.2.1).

Table 5.2 gives a description, quoted from McCrae and Costa (2010), of each of the thirty personality facets in their NEO personality inventory. Below, I briefly discuss the extent to which each trait (and, where appropriate, facet) could logically be expected to correlate with self-reported generalised trust. I then consider the empirical findings to date.

Table 5.2: Facets within the NEO personality inventory (McCrae & Costa, 2010: 21-24)

		Facets	Description of high scorers
Neuroticism		<i>Anxiety</i>	... apprehensive, fearful, prone to worry, nervous, tense and jittery
		<i>Angry hostility</i>	... the tendency to experience anger and related states such as frustration and bitterness
		<i>Depression</i>	Prone to feelings of guilt, sadness, hopelessness, and loneliness...
		<i>Self-consciousness</i>	... uncomfortable around others, sensitive to ridicule, and prone to feelings of inferiority
		<i>Impulsiveness</i>	... inability to control cravings and urges. Desires... are perceived as being so strong that the individual cannot resist them, although he or she may later regret the behavior
Extraversion		<i>Vulnerability</i>	... feel unable to cope with stress, becoming dependent, hopeless, or panicked when facing emergency situations
		<i>Warmth</i>	... affectionate and friendly... genuinely like people and easily form close attachments to others
		<i>Gregariousness</i>	... the preference for other people's company. Gregarious people enjoy the company of others
		<i>Assertiveness</i>	... dominant, forceful, and socially ascendant... speak without hesitation and become group leaders
		<i>Activity</i>	... rapid tempo and vigorous movement, a sense of energy, and a need to keep busy
		<i>Excitement seeking</i>	... crave excitement and stimulation... like bright colours and noisy environments... akin to some aspects of sensation-seeking
		<i>Positive emotions</i>	... tendency to experience positive emotions such as joy, happiness, love, and excitement... laugh easily and often
		<i>Fantasy</i>	... a vivid imagination and an active fantasy life... believe that imagination contributes to a rich and creative life
Openness		<i>Aesthetics</i>	... a deep appreciation for art and beauty... moved by poetry, absorbed in music, intrigued by art...
		<i>Feelings</i>	... receptivity to one's own inner feelings and emotions... experience deeper and more differentiated emotional states and feel both happiness and unhappiness more keenly than others do
		<i>Actions</i>	... the willingness to try different activities, go new place, or eat unusual foods... prefer novelty and variety to familiarity and routine
		<i>Ideas</i>	... active pursuit of intellectual interests for their own sake... open-mindedness and a willingness to consider new, perhaps unconventional ideas
		<i>Values</i>	... readiness to reexamine social, political, and religious values

Facets		Description of high scorers
Agreeableness	<i>Trust</i>	... disposed to believe that others are honest and well-intentioned
	<i>Straightforwardness</i>	... frank, sincere, and ingenuous
	<i>Altruism</i>	... an active concern for others' welfare... and a willingness to assist others in need of help
	<i>Compliance</i>	... tends to defer to others, to inhibit aggression, and to forgive and forget
	<i>Modesty</i>	... humble and self-effacing, though they are not necessarily lacking in self-confidence or self-esteem
Conscientiousness	<i>Tender mindedness</i>	... sympathy and concern for others... moved by others' needs and emphasize the human side of social policies
	<i>Competence</i>	... the sense that one is capable, sensible, prudent, and effective... feel well-prepared to deal with life
	<i>Order</i>	... neat, tidy, and well-organized... keep things in their proper places
	<i>Dutifulness</i>	... adhere strictly to their ethical principles and scrupulously fulfil their moral obligations as they understand them
	<i>Achievement striving</i>	... high aspiration levels and work hard to achieve their goals... diligent and purposeful and have a sense of direction in life
	<i>Self-discipline</i>	... ability to begin tasks and carry them through to completion, despite boredom or other distractions... can motivate themselves to get the job done
	<i>Deliberation</i>	... tendency to think carefully before acting... cautious and deliberate

Reproduced by special permission of the Publisher, Psychological Assessment Resources, Inc., 16204 North Florida Avenue, Lutz, Florida 33549, from the NEO Inventories Professional Manual by Paul T. Costa Jr., PhD and Robert R. McCrae, PhD, Copyright 2010 by Psychological Assessment Resources, Inc. (PAR). Further reproduction is prohibited without permission of PAR.

Neuroticism

As described in Table 5.1, this trait taps the extent to which a person is prone to irrationality and to negative states such as fear, anger and disgust. Its facets are *anxiety*, *angry hostility*, *depression*, *self-consciousness*, *impulsiveness* and *vulnerability*. Aside from impulsivity, these terms are so widely used that they require no explanation. Impulsivity in the NEO inventory refers not to a delight in spontaneity, but rather to decisions borne of emotional instability and perhaps internal conflict. Given the pervasiveness of negative affect within this trait and the

immediacy and dominance of high Neuroticism in influencing decisions (e.g. Graziano & Tobin, 2013), it seems reasonable to expect those with higher levels of Neuroticism to not be inclined to place their trust in strangers. In terms of the facets within Neuroticism, it would not be surprising if most or all of them were negatively associated with generalised trust.

Extraversion

Those who score highly on Extraversion tend to enjoy spending time with other people and to be talkative and optimistic. With facets *warmth*, *gregariousness*, *assertiveness*, *activity*, *excitement-seeking* and *positive emotions*, extraverts are likely to feel at ease socially – although their degree of regard for other people could be either high (e.g. *warmth*) or low (e.g. *assertiveness*; as described in Table 5.2). Given what would appear to be a focus on the positive, it seems fair to expect those who score highly on this trait to be willing to trust others despite the chance of achieving a less than optimal outcome. In particular, the facets *warmth* (indicating a general positive regard for others) and *positive emotions* (with its face associations with trait optimism as described in Chapter 3; Sharpe, Martin & Roth, 2011) may well be positively associated with generalised trust.

Openness

A person who scores highly on Openness is likely to be receptive to new experiences and ideas. The names of its facets – *fantasy*, *aesthetics*, *feelings*, *actions*, *ideas* and *values* – indicate the dimension on which their bearer is open. For example, a high score on *values* is indicative of somebody who is open to questioning cultural and

religious values, while one who scores highly on *feelings* will tend to value their feelings and to experience both positive and negative feelings more strongly than average. It is not immediately clear that this trait should be associated with trust. However, its *action* facet, which taps openness to new experiences, may predispose its bearer to take risks: it may be that this facet is positively associated with trust even if the trait as a whole is not.

Agreeableness

A high score on this trait is likely to indicate a 'people-person'. With the facets *trust*, *straightforwardness*, *altruism*, *compliance*, *modesty* and *tender-mindedness*, somebody with high Agreeableness is likely to care about others, be altruistic and believe in the goodness of human nature. Ignoring the *trust* facet, which should correlate strongly with the self-reported measure of generalised trust, it seems likely that any association between self-reported trust and the other five facets would be likely to stem from either moralistic trust (Uslaner, 2002; trusting because it is a nice thing to do and the highly agreeable person would not want to upset anybody) or *compliance*. In addition, with the high level of prosociality associated with Agreeableness, it is possible that one who scores highly on this trait would evaluate the trustworthiness of others (and therefore their own willingness to trust) based on their own degree of trustworthiness (and hence be trusting; e.g. Sapienza et al., 2013). It seems likely that this trait will show a positive association with self-reported trust.

Conscientiousness

A high score on Conscientiousness typically indicates somebody with a strong sense of purpose and a drive to achieve their goals. The facets within Conscientiousness are *competence, order, dutifulness, achievement-striving, self-discipline* and *deliberation*. It is possible that a high score on Conscientiousness would make an individual disinclined to trust strangers, due to their preference for planning and control: circumstances requiring trust do by their nature have an uncertain outcome and to trust requires handing over control to somebody else. This may be particularly difficult for those who score highly on *order* or *deliberation*.

5.1.3.2 Personality drivers of trust and trustworthiness in the literature

In this section I examine the findings of previous studies that have tested the extent to which personality predicts self-reported trust, and behavioural trust and trustworthiness.

5.1.3.2.1 Empirical evidence: personality and self-reported trust

A few studies have examined the relationship between personality traits and self-reported generalised trust, all three of them using the German Socio-economic Panel (GSOEP) survey. The GSOEP measures personality using the fifteen-item Big Five Index (BFI-S; response scale from 1 = “does not apply to me at all” to 7 =

“applies to me perfectly”), and measures trust using the mean score on the following three items: “In general, one can trust other people”, “These days you cannot rely on anybody else”, and “When dealing with strangers it is better to be careful before you trust them” (response options: totally agree, agree slightly, disagree slightly, totally disagree). One study ran only correlations, while the other two subjected the data to regression analysis.

Becker et al. (2012) report significant correlations between trust and Neuroticism ($r = -.19$), Openness ($r = .13$), Agreeableness ($r = .09$), Conscientiousness ($r = -.07$) and Extraversion ($r = .06$, all $p < .01$). These results indicate a positive effect of Openness, Agreeableness and Extraversion on trust, and a negative effect of Neuroticism and Conscientiousness.

Dohmen et al. (2008) ran ordinary least squares (OLS) regression analysis to determine the effects of personality traits on trust. In a model that accounted for age, gender and height, Dohmen and colleagues report significant associations for four of the five traits: Neuroticism ($\beta = -.148$), Openness ($\beta = .109$), Conscientiousness ($\beta = -.083$) and Agreeableness ($\beta = .079$; all $p < .01$). Similarly to the findings of Becker et al. (2012), they find a positive effect of Openness and Agreeableness, and a negative effect of Neuroticism and Conscientiousness.

And finally, Albanese et al. (2013) reported a significant positive association⁴⁰ for Openness (.020, $p < .05$), and a significant negative association for Neuroticism (-.116, $p < .01$) and Conscientiousness (-.100, $p < .01$). They report non-significant effects for Agreeableness (.015, *ns*) and Extraversion (.008, *ns*). However, the models used by Albanese and colleagues included measures of risk aversion, positive and negative reciprocity and altruism, all of which have theoretical associations with the Big Five traits and therefore may have masked the actual relationships between the traits and the outcome measure.

A concern regarding the associations reported by each of these studies is that in some cases the coefficients seem remarkably low. I therefore suspect that in some cases the statistical significance of these associations may be driven by the sample size in the GSOEP (over 14,000 cases) rather than by the magnitude of the relationship between the predictor and outcome variables.

Clearly, there is some evidence for Personality Theory, albeit not incredibly robust given the measures used and the lack of reported effect sizes. Of the three studies that tested the associations between generalised trust and personality traits, all agree that Neuroticism has a negative effect on trust, while two agree that Conscientiousness has a negative effect and Agreeableness has a positive effect.

⁴⁰ Unfortunately it is not clear whether Albanese et al. (2013) present standardised or unstandardised coefficients.

5.1.3.2.2 Personality and behavioural trust

In correlation analysis of experimental data, Becker et al. (2012) reported significant associations for Agreeableness (.17), Conscientiousness (-.13) and Openness (.12; all $p < .01$), with non-significant associations for Extraversion and Neuroticism. In their experimental dataset, traits were measured using either the NEO-FFI ($N = 319$) or the BFI-S ($N = 170$).

Müller & Schwieren (2012) implemented a version of the trust game in which both players were given ten 'experimental currency units' (ECU, worth approximately €3.33) at the start. The Sender could choose to transfer any portion of this ECU10 to the Returner. Any units transferred were tripled, and the Returner could then transfer any amount from their new total endowment back to the Sender. Participants completed a questionnaire that included the 240-item NEO-PI-R questionnaire (McCrae & Costa, 2010).

The authors report that trusting behaviour as the Sender is associated with a lower level of Neuroticism (-.339, $p < .01$) and a higher level of Agreeableness (.284, $p < .05$), and shows a trend towards a significant relationship with Conscientiousness such that trusting is associated with a lower score on this trait (-.258, $p < .1$; given the magnitude of this correlation, it is possible that the non-significant value is due to the low number of cases in the analysis [$N = 58$])⁴¹. These findings were

⁴¹ Müller and Schwieren (2012) identify Conscientiousness as being significantly correlated with the Sender's decision, however, this is significant at the level of $p < .1$; in this study I use the threshold $p < .05$.

maintained in regression analysis, with coefficients indicating that Neuroticism ($-.400, p < .01$) is the most important to driving trust, followed by Conscientiousness ($-.353, p < .01$) and finally Agreeableness ($.246, p < .05$; the model also included age and gender, which were both non-significant).

Investigating the association between Sender behaviour and the facets within the three significantly predictive traits, Müller and Schwieren (2012) report that several facets demonstrate significant correlations: *anxiety*, *angry hostility* and *depression* within Neuroticism (all negatively associated with the amount sent), *trust* and *straightforwardness* within Agreeableness (both positively associated), and *order* and *deliberation* within Conscientiousness – with a trend towards significance for *achievement striving* (all negatively associated). However, in regression analysis that also accounts for age and gender, none of these significantly predict behaviour (in a model that excludes demographic variables, *anxiety*, *trust* and *order* remain significant).

For both self-reported and behavioural trust, the inconsistency of the results reported by these studies is not especially encouraging. However, several points should be borne in mind: (1) the GSOEP measures personality traits using only fifteen items – this equates to three items per trait; (2) the differing use of the trust items means the findings cannot really be compared between studies; (3) the inclusion (in regression models) of predictors that are heavily associated with traits is likely to undermine the strength of the association between traits and the outcome measure; (4) the experimental design used by Müller and Schwieren

(2012), in which participants were able to send and return any amount, may not have adequately distinguished between those who are trusting/ untrusting, and trustworthy/ untrustworthy; and, (5) Müller and Schwieren report having only 58 cases in their regression analyses, which is likely to have been too few for the number of variables in their models (Soper, 2014).

From the results of these studies there may be some overlap in the personality-based drivers of self-reported and behavioural trust: in both cases, negative associations are reported for Neuroticism and Conscientiousness, and a positive association for Agreeableness.

The literature that uses the trust game reveals, as discussed in Chapter 3, a range of experimental designs. The design of the study may have an impact on the likelihood of the players being trusting and trustworthy. For example, whether the Sender may invest part of their stake or only 'all or nothing' and what options the Returner has regarding how to split their spoils. In this study I use a simplified design developed by Ermisch & Gambetta (2006) that removes some of these confounding factors.

5.1.3.2.3 Personality and behavioural trustworthiness

The relationship between personality and trustworthiness appears to have scarcely been investigated. Here I describe the studies that were forthcoming in the literature.

In the same experiment with student participants as that reported above for behavioural trust, Becker and colleagues (2012) took participants' behaviour as the Returner in the trust game as a measure of positive reciprocity. They find this behaviour to be positively correlated with Openness ($r = .17$, $p < .001$) and Agreeableness ($r = .20$, $p < .001$). While the analysis does not control for the amount transferred by the Sender, this is not a problem because Becker and colleagues elicited from each Returner the amount they would transfer back to the Sender given all possible amounts they could receive.

As described above, Müller and Schwieren (2012) used the NEO-PI-R to examine the relationships between personality traits and behaviour as the Returner in the trust game. The authors report that the only significant correlation is with the amount sent by the Sender in the first place. Looking only at a subsample (those Returners who were sent at least ECU5) revealed a significant positive correlation between the amount returned and the Conscientiousness facet *competence*. However, this was not supported in regression analysis, leading the authors to conclude that trustworthiness is not associated with personality.

This non-correspondence between the personality-based predictors of trustworthiness and self-reported trust is not particularly encouraging. However, these results may have been heavily influenced by the design of Müller and Schwieren's (2012) version of the trust game. With Senders able to invest any proportion of their initial stake, the amount transferred back by the Returner is

likely to have been dependent on the amount invested in the first place – so, effectively, the Returners were not all responding to the same scenario. In addition, with a one-shot game design, only half of their participants provided data for each behavioural measure: a sample of approximately sixty participants may offer too little power to find any effects.

5.1.3.2.4 Summary: trust-related outcome measures and personality

It appears that no study to date has used the full personality inventory to predict self-reported trust; this means that previous studies only offer data for the higher-order traits rather than the facets that comprise them. Without the facet-level data, we are missing out on the nuances of what drives the traits' associations. It is also difficult to unpick the results of studies that have modelled factors that are highly likely to themselves be driven by personality (such as risk aversion) alongside personality variables as predictors of trust in regression models. This is likely to corrupt the observed relationships between the personality variables and the outcome measure.

In addition, the sparsely populated literature base comprises a range of trust game designs. Factors such as whether just the Sender or both participants begin the game with a monetary stake, and whether the players may transfer any proportion of their endowment or are restricted to a set amount, are likely to have an impact on the motives that drive the Sender to invest and the Returner to reciprocate.

There do however appear to be some associations between personality and trust-related outcome measures. This study seeks to investigate these associations in closer detail by examining the extent to which personality traits and facets predict self-reported trust, behavioural trust and trustworthiness.

5.1.4 Hypotheses and research questions

There are conflicting reports regarding the associations between self-reported trust and the two behavioural measures, and there is little theory to guide hypotheses regarding which personality traits and facets are likely to be associated with them. With this in mind, while I do make some predictions where the literature appears compelling enough to support them, this study is largely exploratory and as such will predominantly respond to a series of research questions.

5.1.4.1 Personality and self-reported trust

Research question 1: Which personality traits are associated with generalised trust?

Hypothesis 1: Theoretical accounts posit the relevance of prosocial values to generalised trust (e.g. Uslaner, 2002). With higher levels of prosociality, Agreeableness should be positively associated with trust.

Hypothesis 2: Those who score highly on Extraversion should be more inclined to focus on the potential reward from encountering a trustworthy trustee, thus making them more inclined to risk betrayal.

Hypothesis 3: With Neuroticism predisposing its bearer to experience negative emotion and to anticipate negative outcomes, those who score highly on this trait should be disinclined to risk encountering an untrustworthy trustee.

Research question 2: Which personality facets predict generalised trust?

5.1.4.2 Personality and behavioural trust

Research question 3: Which personality traits and facets are associated with behavioural trust?

5.1.4.3 Personality and trustworthiness

Research question 4: which traits and facets are associated with behavioural trustworthiness?

Hypothesis 4: Given the prosociality associated with Agreeableness, this trait should be positively associated with behavioural trustworthiness.

5.1.5 A note on the possible influence of context

It is possible that participants in this study will demonstrate more trust and trustworthiness due to the setting. All participants are members of the University community, and they may have participated in multiple experiments at the Lab. This may generate a 'panel' effect, whereby familiarity induces higher levels of trust and trustworthiness than may be observed in a random population sample (Ermisch et al., 2009).

5.2 Experimental design

Each participant attended two experimental sessions: a questionnaire session, followed approximately one week later by two rounds of the trust game. The game was presented a week after the questionnaire in an attempt to avoid their responses to the questionnaire priming their behaviour during the game. Both the questionnaire and the game took place in ESSEXLab, a social sciences laboratory at the University of Essex. Participants sit at workstations in cubicles so while they are able to hear the experimenter and to attract the experimenter's attention by raising their hand, they cannot see or easily communicate with the other participants.

I hosted the lab sessions using standardised experimenter scripts, consent forms and participant information sheets. I often received assistance from a member of staff at the beginning of the session to register participants as they came into the Lab.

Sample

Self-reported trust has been found to vary with a range of characteristics including age (Gundelach, 2014), gender (Olivera, 2013), ethnicity (Uslaner, 2008) and level of education (Gundelach, 2014; Olivera, 2013), as well as varying cross-culturally (Ahmed & Salas, 2009; Schwartz, 2007). Meanwhile, behaviour in economic games (e.g. Chuah, 2010) has been found to vary between students and non-students (Naef & Schupp, 2009), cross-culturally (see Ahmed & Salas, 2009; see also Johnson & Mislin, 2011) and with the ethnic composition of the group (Burks, Carpenter & Verhoogen, 2003). With these potential influences on the outcome measures, identifying a suitable sample was not easy. Budget limitations meant that I would not be able to recruit enough participants to test for intergroup differences, so it was necessary to recruit as homogenous a sample as possible. In consultation with the Lab Manager, I advertised my study to British, white undergraduate students aged 18-24 years; as the largest subgroup within the Lab's participant pool, these criteria gave me the best chance of recruiting enough participants for my study.

While these restrictions substantially limit the generalisability of my findings, given the low number of participants and the exploratory nature of this study these restrictions were necessary in order to avoid having to subcategorise my cases to account for these potential influences; doing so would have substantially reduced the power of my analyses to detect significant effects. While it is still possible that

confounding effects materialised (for example, if somebody was born in the UK but grew up overseas), this recruitment strategy should reduce the prevalence of such cases which would otherwise have been very high in a diverse university environment.

Participant recruitment

I recruited participants using the ESSEXLab computer system, hroot. This holds the details of everybody who is registered with the Lab as a participant and allows experimenters to specify any criteria they need to recruit by. The specifications I used were as follows: degree (Undergraduate), nationality (UK), ethnicity (white) and date of birth (recruiting only those aged 18 – 24 years). It became clear that the lists of participants assigned to a study in hroot can become corrupted over time (I discovered in February that my list from October contained participants who did not meet any of my criteria), so I re-generated my list of assigned participants each term. In doing so, I re-specified my ‘date of birth’ criterion to avoid recruiting anybody who had since turned 25.

Randomisation

On their way into the Lab, participants selected a numbered ball at random from an opaque bag. This advised them which workstation they should sit at. While

randomisation was not necessary for the questionnaire session, in the trust game they were paired at random with other participants in the Lab according to an algorithm in the zTree programme (Fischbacher, 2007). Randomising participants' seating reduced the likelihood of individuals' seating preferences pre-determining who they would be paired with.

Data matching

I provided participants with a code so that I would be able to match their data from the two sessions. While some experimenters ask participants to enter their student ID as their unique code, given the potentially sensitive nature of the personality measures (e.g. the indicators of depression and anxiety), I wanted participants to be assured that nobody would be able to identify them from their data. I used an online 'random number generator' to draw 180 unique five-digit numbers between 10000 – 19999 and provided these on a slip of paper attached to their Session 1 consent form.

At the end of Session 1, participants took their slip of paper with them with the intention of bringing it to Session 2 (the trust game). I also wrote these codes on the top left corner on the back of the Session 1 consent forms in anticipation that some participants might not bring their code with them to Session 2. Once a participant had completed both sessions (or had dropped out of the experiment) and I had

checked that the numbers tallied between sessions, the corner was removed from each Session 1 consent form to fully anonymise my dataset.

5.2.1 Part 1: the questionnaire

5.2.1.1 Questionnaire content

The questionnaire comprised 297 items, including two batteries of questions to measure participants' values (the Schwartz Human Values Scale – 21 items; Schwartz, 2001) and personality traits (the 240-item NEO-PI-3 measuring the Big Five traits; McCrae & Costa, 2010). The remaining questions measure participants' self-reported social trust (three items), degree of comfort living on their current income (one item), ideological orientation (one item), attitude towards risk (seven items), and positive and negative reciprocity (six items). Ermisch et al. (2007) note that it is difficult to reliably measure trustworthiness via a self-report item; I therefore test whether self-reported positive reciprocity is indicative of trustworthiness, and whether participants' negative reciprocity score can be used as a proxy for betrayal aversion (Fehr, 2008). One of the social trust items, the generalised trust question (GTQ), forms participants' *self-reported generalised trust* score. Given its importance as an outcome measure in this study, I positioned the GTQ as the first item in the questionnaire to avoid corruption by preceding items.

The questionnaire also included measures of gender, age, religion, religiosity and ethnicity, as well as a few items about their academic status: whether they are an undergraduate or postgraduate, their academic department, whether they are full-time or part-time and their year of study. Finally, I ask a few items that seek to measure the quality of the environment they had lived in before coming to university: how safe they felt walking alone after dark, and whether they had reason to complain about noise, air pollution, lack of access to green spaces, water quality, crime or litter (see Appendix 5A for the full list of items)⁴².

5.2.1.2 Questionnaire design

I elected to field the Schwartz HVS before the NEO-PI-3, reasoning that the vignettes described in the values items are more subtle while the NEO-PI-3 may instil keywords that could prime participants to respond to the values items in a particular way. The demographic questions are given at the end of the survey for the same reason (aside from gender – unfortunately this had to be asked before the HVS items because these are not gender neutral but use he/him/his and she/her to make it easier for respondents to identify with the person in the vignette).

The survey was fielded as a self-completion questionnaire, which participants filled in online via Qualtrics (Qualtrics, Provo, UT) at private workstations in the Essex Social Sciences Experimental Laboratory (ESSEXLab). Work by Martin and Lynn

⁴² Due to copyright it is not possible to give more than three items from the NEO-PI-3; a copy of the full questionnaire may be available from the publisher, PAR Inc (www4.parinc.com)

(2011) has investigated the comparability of mixed mode data collection using the European Social Survey (ESS) and an ESS-based experiment in the Netherlands. They found that respondents in the self-completion mode appear to have been less influenced by social desirability concerns and therefore to have given more accurate answers to sensitive questions. The questionnaire used in the present study borrows its social trust and Schwartz Human Values Scale (HVS) items from the ESS. Martin and Lynn report that both the social trust scale (specified as a single factor) and the HVS (specified as the four higher-order values dimensions: Self-enhancement, Conservation, Openness to Change and Self-transcendence) achieve configural, metric and scalar equivalence across face-to-face, telephone and self-completion modes. This is encouraging, suggesting that while the choice of mode may influence the mean scores it does not appear to have an impact on the integrity of the measurement scales.

Although usually administered as a pencil and paper questionnaire, the publisher granted me permission to transcribe the NEO-PI-3 inventory into Qualtrics for the purpose of this experiment. The NEO-PI-3 is an updated version of the NEO-PI-R, adapted for use in younger samples. In this instance, I elected to use the NEO-PI-3 because it is less oriented in the American culture and American language (see McCrae et al., 2000, for a discussion of the differences between the two inventories). I did consider using the UK version of the NEO-PI-R, published by Hogrefe, however, it was not clear how much time would be required to arrange this and time constraints for pilot testing meant I needed to choose a more immediate alternative.

Given that some of the items in the NEO-PI-3 are quite probing (particularly those that measure depression), I felt there was the possibility that these may trigger concern for participants about their wellbeing. The final page of my questionnaire therefore included contact information for Student Support and for the University's Nightline telephone service.

5.2.1.3 Administration and participant reward

At the beginning of the questionnaire session, I read out to the participants three standardised documents: an experimenter script, a consent form (Appendix 5C.1) and a participant information sheet (Appendix 5C.2). The experimenter script ensured that I gave all groups the same information at the start of the session, and the other two documents advised participants on issues relating to payment and data security (the consent form), and the Lab rules and any tips for how to complete the questionnaire (the information sheet).

Pre-testing suggested that the questionnaire may take on average 35 minutes to complete, so participants were paid £5 for this first visit to the Lab (this included a £2.50 show up fee that all participants are entitled to if they arrive at the Lab on time). The consent form reminded participants that they would receive payment for the questionnaire at the end of the second session (although, in accordance with

ESSEXLab rules, any participants who only completed the questionnaire were still paid for that first session).

Due to difficulty recruiting participants in the latter stages of the study, I doubled the show-up fee so that all participants who arrived at the Lab on time would know they were guaranteed to receive at least £5 per session. This meant that for the questionnaire session, those who took part from late February onwards were paid £7.50.

5.2.2 Part 2: the trust game

5.2.2.1 Design of the game

The version of the trust game that I use here was inspired by the experimental design developed by Ermisch and Gambetta (2006) and used by Ermisch et al. (2009). Participants in the experiment fielded by Ermisch and colleagues were ex-respondents to the British Household Panel Survey. Those selected to play as the Sender were physically given £10 as payment for their participation in an interview. They were then given the option of sending this £10 to another participant. They were informed that if they did send the money it would be turned into £40 and the person who received it (the Returner) would be allowed to transfer either £0 or £22 back to the Sender. Ermisch and colleagues report that around 40% of Senders

chose to invest their £10, and 50% of Returners sent back £22 (i.e. were trustworthy; the other 50% kept the £40).

With each player in the game having only a binary choice – to keep the money or send it (the Sender), and to return one of two amounts (the Returner) – it is reasoned that this design should differentiate well between being trusting or not trusting, and between being trustworthy or not trustworthy. In addition, since both players will know the rules that each other is playing by, the Sender's expectations (in the event that they choose to invest their money) will be clear to the Returner. The Returner therefore knowingly makes a decision that corresponds to either other-regard or self-interest. This design also ensures that all Returners are responding to the same investment decision. In games where Senders and Returners can transfer any amount of money, and the Returner is aware of how much money the Sender has invested, Returners are each responding to a different scenario: the proportion they transfer back to the Sender then varies depending on the amount the Sender invested (Ermisch et al., 2009). In instances of very low investment by the Sender, the Returner may not even be given the opportunity to demonstrate trustworthiness.

While Ermisch et al.'s (2009) experiment involved a one-shot game, each participant in my study played the game twice – once as the Sender and once as the Returner. This enabled me to obtain behavioural trust and trustworthiness data from all participants. In the Lab, participants were randomly and anonymously paired. After the first game, they were re-paired so they would play a different person in the

second game. The participants only found out how their game partners had behaved after both games had been played. This design sought to avoid strategic play and to elicit participants' natural behaviours.

The experiment uses the standard trust game format, in which the Sender begins the game with £5 and the Returner starts with £0. The Sender can choose to keep their £5 or to invest it with the Returner. If the Sender keeps the £5, the game is over. If they invest their £5, the £5 becomes £15. The Returner then chooses to transfer either £0 or £10 to the Sender. The Returner's decision regarding how much money to transfer to the Sender was made before they know whether the money has been invested with them: this ensured that trustworthiness data could be collected from all participants and that the Returner's decision would not be influenced by the Sender's behaviour.

5.2.2.2 Administration and participant reward

The trust game was programmed as a zTree treatment file. At the beginning of the game session, I read out a consent form (Appendix 5C.3) and a participant information sheet (Appendix 5C.4). The consent form primarily advised regarding data security, while the information sheet explained the game and how their winnings would be calculated.

All participants were guaranteed to leave the Lab with at least their £2.50 show-up fee. However, due to the variable nature of payoffs from this session, this show-up fee was paid on top of any winnings in the trust game (under this design: £0, £5, £10 or £15)⁴³. To calculate participants' take-home winnings from the two rounds of the trust game, zTree chose one of the two rounds of the game at random and all participants were paid according to their winnings in that game.

The wording of the participant information sheet encouraged the Sender to feel a sense of ownership over their £5 endowment. This was to try to ensure that their choice regarding whether or not to invest the £5 would resemble a trust decision rather than a cooperation decision. It is evident from the literature that trustworthiness and cooperation are experientially and aetiologically different constructs, so it is important to frame the task in a way that primes trust and trustworthiness rather than cooperation. However, I took care to avoid being prescriptive to the Sender or Returner; it was important that they made their decisions based on their own drives rather than being swayed by framing effects (see Appendix 5C.4 for the wording of the participant information sheet).

⁴³ As in the questionnaire sessions, those who participated from the end of February onwards were awarded a double show-up fee – meaning that all participants were guaranteed to take home at least £5 from the trust game session.

5.2.2.3 Additional measures

I took the opportunity to collect several other pieces of information via the zTree programme. After they had played both rounds of the trust game, and before they found out the outcome from these games, participants responded to two hypothetical scenarios as though they were additional rounds of the game⁴⁴. In both scenarios the participant took the role of the Sender. They were asked how high a probability they would need of receiving £10 from the Returner before they would be willing to invest their £5 if the Returner were (a) an anonymous stranger, and (b) a computer programme. Together these items form an experimental measure of betrayal aversion, since those who are averse to betrayal should require a more certain payoff in scenario (a) than in scenario (b).⁴⁵

After participants had responded to the items measuring betrayal aversion, they were informed on-screen of their and their opponents' scores in the two rounds of the game and advised which round they would be paid for. Participants were then invited to donate a portion of their earnings to charity. The charity was named as Essex Air Ambulance and a cell given into which they could type the amount they wished to donate. On-screen information advised that any amount was allowed, from £0 upwards in denominations of £0.50. As far as I am aware, this addition to the trust game has not been implemented before. With charitable donations

⁴⁴ The on-screen instructions made it clear to participants that these questions were entirely hypothetical and would in no way affect their scores in the games they had just played.

⁴⁵ In the absence of an appropriate measure of betrayal aversion in the literature, I constructed this item based on a measure used by Bohnet, Greig, Herrmann, and Zeckhauser (2008), adapting it for the trust game. In theory, those who are averse to betrayal (rather than risk) should report a lower MAP when the decision will be made by a computer, since a computer cannot 'betray' per se.

generally found to be associated with prosocial characteristics, it will be interesting to see who, if anybody, takes the opportunity to donate.

Finally, I asked participants to briefly tell me why they made the decisions they did as the Sender and as the Returner. This too was exploratory, to see whether I could gain any insight into participants' decisions. I also wanted to check whether anybody would mention contextual effects as described earlier. In panel surveys, respondents often demonstrate more confiding behaviour due to their sense of familiarity with the interviewer or survey. The equivalent behaviour here would be a higher rate of investing (as the Sender) or a higher rate of trustworthiness (as the Returner).

5.3 Data and methods

In this section I describe the data collected by my questionnaire and game, and the methods I used to test my hypotheses. The content of my questionnaire is given (where permitted) in Appendix 5A.

5.3.1 Data

My outcome measures are self-reported generalised trust, behavioural trust and trustworthiness. Generalised trust was measured by the generalised trust question (GTQ): "In general, do you feel most people can be trusted or you can't be too

careful in dealing with people?” and this item was measured on an eleven-point scale, where ‘0’ indicated “You can’t be too careful” and ‘10’ indicated “Most people can be trusted”. Behavioural trust was a binary variable and given by the participant’s behaviours as the Sender in the trust game: investing their £5 stake was scored as being trusting, while keeping it was scored as being cautious. Behavioural trustworthiness was also a binary variable, given by the participant’s behaviour as the Returner in the trust game: returning £10 was scored as being trustworthy, while returning £0 was scored as being untrustworthy.

I measured personality using McCrae and Costa’s (2010) 240-item NEO-PI-3 measure of the Big Five personality traits and their facets. Due to copyright it is not possible to reproduce here the content of the questionnaire, but each item was measured on a five-point scale (strongly disagree, disagree, neutral, agree, strongly agree). PAR Inc, the publisher of the NEO inventory, supplied a coding sheet that detailed which items have been reverse-coded and how to derive the facet and trait scores from the raw data. The 240 items reduce to 30 personality facets and these reduce further to the Big Five personality traits (as described in Tables 5.1 and 5.2 above). I am able to reproduce here up to three items from the NEO-PI-3 for illustrative purposes (see Section 5.4.3.1 for an item from the *trust* facet, and 5.4.3.2 for one item each from the *gregariousness* and *warmth* facets).

Risk aversion was measured using a single item, “How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?”, which was measured on an eleven-point scale where ‘0’ represented “Not at

all willing to take risks” and ‘10’ represented “Very willing to take risks”. I also fielded a battery of six items, one of which asks how willing the participant is to take risks financially, and another how willing to take risks with their faith in other people. These items were scored on the same eleven-point scale as the generic risk aversion item.

Positive and negative reciprocity were each measured using three items borrowed from the German SOEP questionnaire. The items measuring positive reciprocity are: “If someone does me a favour, I am prepared to return it”, “I go out of my way to help somebody who has been kind to me before” and “I am ready to undergo personal costs to help somebody who helped me before”. And those measuring negative reciprocity: “If I suffer a serious wrong, I will take revenge as soon as possible, no matter what the cost”, “If somebody puts me in a difficult position, I will do the same to him/ her” and “If somebody offends me, I will offend him/ her back”. Both sets of items are measured on a seven-point scale, where ‘1’ means “does not apply to me at all” and ‘7’ means “applies to me perfectly”. The mean score across all three items gives the respondent’s positive and negative reciprocity scores.

Financial security was measured by a single item, asking “How well would you say you yourself are managing financially these days?” and scored on a five-point scale: living comfortably, doing alright, just about getting by, finding it quite difficult, and finding it very difficult.

Quality of the home neighbourhood was measured using the following items: “How safe would you – or did you – feel walking alone in this area after dark?” (very safe, safe, unsafe, very unsafe); and a set of items measuring whether they had reason to complain about noise, air pollution, lack of access to green spaces, water quality, crime and litter (very many reasons, many reasons, a few reasons, and no reason at all).

The questionnaire also measured Schwartz’s human values (Universalism, Benevolence, Conformity, Tradition, Security, Power, Achievement, Hedonism, Stimulation and Self-direction), although these are not used in the analyses presented here (see Appendix 5A for the vignettes in the HVS and their measurement scale).

As reported earlier, the additional variables captured during the trust game are betrayal aversion, whether the participant donated any money to charity (and, if so, the amount donated), and qualitative descriptions of the participant’s reasons for their decisions as the Sender and as the Returner.

The betrayal aversion item was presented after participants had played both rounds of the trust game, and asked them to imagine they were playing two more rounds of the game as the Sender. The rules were exactly the same, except that in the first round the Returner’s decision would be made by an anonymous stranger while in the second round this decision would be made by a computer. Participants were asked to state the minimum probability they would accept, of receiving £10, before

they would be willing to invest their £5 in each scenario. In theory, these two figures should match because both relate to the likelihood of receiving £10 from the Returner. However, if the participant is averse to betrayal, their minimum acceptable probability should be higher in the scenario where the Returner is a person: a person can betray, while a computer cannot.

5.3.2 Analytical methods

Before constructing my regression models, it was necessary to identify which, if any, additional variables need to be accounted for. In this section I briefly describe my approach to analysing the data, first discussing the desirability of testing for any unintended effects of the session characteristics before taking a look at the moderators that may influence the observed relationships between personality and the outcome measures.

5.3.2.1 Confounding variables

Given the number of data collection sessions, it would be desirable to first check for any effect of these incidental variables. The ways in which Lab sessions may have varied include: the time in the academic year, time of day, number of people in the session, gender balance, provision of a double show-up fee and occasionally the presence of an unofficial participant in the trust game session to ensure I would

have enough participants to run the game (in consultation with the Lab Manager, I decided that each session should have at least six participants in order to give credibility to the advice that they would be ‘randomly and anonymously’ paired with a different person in each of the two games).

While it would be desirable to check for any unintentional experimental effects associated with these variables, the low number of participants means that any differences observed between groups may be genuine variation rather than a ‘treatment’ effect. In addition, some of these variables overlap; for example, the offer of an incentive only applies to participants from the end of February onwards so this encompasses the Summer term and those groups held in the latter stages of the Spring term. Similarly, attempting to investigate the effect of the number of participants in the session would result in drawing conclusions based on very few sessions for the higher numbers, making it impossible to distinguish between an effect of the group size versus an effect relating to those particular sessions (e.g. being near to Christmas or the end of term).

For these variables I therefore just describe the proportion of participants who attended sessions under each ‘condition’ in order to provide contextual information.

5.3.2.2 Moderator variables

Moderator variables are those that are included in a model not because we are interested in their effect on the outcome measure but because we have reason to suspect that they may have an influence on the relationship between the key predictors and the outcome measure. Here I discuss the variables that are available in my dataset and any theoretical grounding for expecting each one to influence the relationship between the personality constructs and the trust-related outcome measures.

While demographic characteristics (such as age, gender and education) are often included in regression models as control variables, there is an argument for excluding them. Personality varies with age and gender, and the coding for the NEO traits and facets does itself differentiate between genders. In addition, I have no reason to expect the demographic variables to influence the relationship between personality and the dependent variables; any association should be visible via the personality-based predictors. To include these control variables in my models therefore risks masking the true effect of personality on trust and trustworthiness. To accommodate both perspectives, however, I present two sets of models for each outcome variable – one set of models that control for demographic variables and a set that do not.

Financial insecurity Financial situation, measured as household income, is reported to be positively associated with one's level of generalised trust (e.g. Naef & Schupp,

2009; Fehr, 2008). It is reasonable to expect that one's degree of financial security may moderate the relationship between personality and trust; low financial security may make one more cautious to avoid the risk of losses that cannot easily be replaced.

Game 1 as Sender Those who played as the Sender in Game 1 may be more likely to invest their £5 stake; by the time Game 2 Senders make their investment decision, they have become aware of any temptation to keep the £15 and also of their own (perhaps untrustworthy) behaviour. In addition, when Game 1 Senders play as the Returner in Game 2 they may be more likely to be trustworthy as they may have a greater appreciation for the chance the Sender has taken in investing.

Positive and negative reciprocity, betrayal aversion and risk aversion For obvious reasons, these variables are all likely to influence the degree of trust the individual is willing to show and report. However, it is also likely that one's scores on these variables are driven by personality.

Before commencing the preliminary regression models, I test the extent to which personality predicts scores on each of the above variables. Despite their being, in theory, unrelated to personality I also test these relationships for 'Game 1 as Sender' and for 'Double show-up fee', in case by chance there is an uneven distribution of personalities between the two conditions of these variables. Any potential moderator variables that are driven by personality will need to be excluded from my

regression models in order to avoid corrupting the observed relationships between personality variables and the outcome measures.

For items scored on a Likert scale (for example, self-reported trust which is scored on an eleven-point scale) I use ordinary linear regression, while for dichotomous variables (for example, the two behavioural measures) I use logistic regression. To assist with the interpretation of my results, I also consider the magnitude of the observed effects. Unlike significance values, effect size is immune to the influence of sample size and should provide a more transparent indicator of the association between my predictor and outcome variables. As an effect size, Cohen's (1992) r is appropriate for this study due to my analyses being correlational rather than involving the comparison of group means. In discussing the effect sizes I refer to $.10 \leq r \leq .30$ as a 'weak' effect, $.30 \leq r \leq .50$ as 'moderate' and $r \geq .50$ as 'strong', however, given that these thresholds are somewhat nebulous (e.g. Durlak, 2009) I predominantly use them to facilitate comparisons within the results (e.g. between traits for a particular outcome measure, or between outcome measures). The results of these checks are discussed in Section 5.4.2.1.

5.3.2.3 Correlations and t-tests

Having identified my potential moderator variables that are not driven by personality (and therefore can be included in my models), I test whether these

variables are associated with any of my trust-related outcome measures. Any that show a significant association are then included in the relevant regression models.

5.3.2.4 Regression models

My initial model for each outcome measure includes just the five personality traits. Subsequent models include any moderator variables and, finally, I run a set of thirty models that test in turn the predictive capacity of each personality facet. In each case, the facet replaces its host trait in the model to feature alongside the other four personality traits (for example, the first Neuroticism facet, *anxiety*, is modelled alongside Extraversion, Openness, Agreeableness and Conscientiousness. While there does not appear to be a standard way to enter the NEO traits and facets as predictors in regression models, it is likely that including all facets in a single model would result in some degree of corruption of the coefficients. My proposed method is similar to that used by Weiss and Costa (2005). The results of these analyses are discussed in Section 5.4.3.

5.4 Results and Discussion

5.4.1 Descriptive analyses

5.4.1.1 Sample

One hundred and forty individuals participated in both the questionnaire and the trust game, while an additional thirty people attended only the questionnaire session. The first 121 participants were paid £5 for the questionnaire while the remaining 49 were paid £7.50, as detailed above. All were paid between £2.50 - £20 for their participation in the trust game session. Both payments included a £2.50 (or £5, for the final 49 people) show-up fee. Payment for both sessions was given, confidentially, at the end of the trust game session.⁴⁶

The majority of the analyses in this write-up relate to those 140 participants (N140) who completed the full experiment. However, in discussing my regression models for self-reported trust I compare these findings with those obtained when using a different subsample of participants (N122); I describe this subsample in Section 5.4.1.4.

⁴⁶ Several additional people participated in some of the trust game sessions, to ensure I would have enough participants (at least 6 per session) to play the game. These people were not primed to behave in any particular way and were paid for the game session only.

Below I describe the characteristics of the sample, their mean scores on the control, predictor and outcome variables and any adjustments I make to the coding for each variable before using it in my analyses.

5.4.1.2 Demographic variables

Gender 49% of the sample were female.

Age Although the participants' ages ranged from 18 to 24 years, the mean age was 20 years and 93% were aged 18 – 21. With only two participants aged 23 and one aged 24, it would not be appropriate to code these ages separately. I have therefore coded ages 22 – 24 together.

Academic discipline The spread across academic departments was broad, with most departments at the University of Essex represented. Students of Biology comprised the largest proportion of the sample (18%), followed by those of Literature, Film and Theatre Studies (11%), Psychology (10%), and Computer Science and Electrical Engineering, Government, Mathematics and Sociology (each at 6.4%, indicating eight or nine participants). The remaining 35% were split between, amongst others: Economics, Business, Hotel School, History, Language and Linguistics, Law, Philosophy and Art History. I do not control for discipline in the analyses – this was included purely to check the reach of the study – for example, if 75% of my

participants had been Economics students I would have expressed more caution about the results due to their likely understanding of economic games.

Undergraduate/ postgraduate status I included a measure of undergraduate versus postgraduate status in order to check that this recruitment criterion had been effective. While I was largely successful in recruiting only undergraduates, due to the procedures used by the Lab my sample does include four postgraduates: the Lab relies on participants, once registered, seeking to update their information on the system when they cease being an undergraduate.

Year of study Thirty-seven percent of the sample are coded as being in the first year of their degree, 36% in the second, 19% in the third and 8% in the fourth. This takes into account that of the four postgraduates three reported being in their first or second year of study. I recoded these to be in their fourth year.

Ethnicity Similarly to my education variable, I included this measure as a check and it revealed that I had recruited five participants who do not regard themselves as being of UK or Irish ethnicity but instead are “Other White”. I had specified UK nationality when recruiting participants, so it is possible that these five were born outside of the UK and Ireland. I am not able to determine how long these individuals have lived in the UK, so it is possible that the cultural influences on their responses and behaviour are different to those of the majority of my participants. In addition, I have two participants who preferred not to disclose their ethnicity. I have kept these

seven participants in the dataset because in a sample of 140 people any differences are not likely to have an impact on the results.

Financial insecurity Fifty-two percent reported living comfortably or doing alright, while 19% were finding it quite or very difficult. The mean score was 2.61 (SD = 1.001), indicating that on average the participants were 'doing alright'.

Religion Twenty-seven participants (19%) reported a religious affiliation. Of these, eight (6%) reported being Roman Catholic, nine (6%) Church of England or Anglican, five (4%) other Christian, and one each were Greek or Russian Orthodox, Sikh, Buddhist, Muslim and other non-Christian, and one preferred not to say.

Religiosity All participants were asked how religious they are, irrespective of whether they are affiliated with a particular religion. On a scale from '0' (not at all) to '10' (very religious), participants' mean score was 1.79 (SD = 2.04). This breaks down into a mean score of 3.96 (SD = 1.79) for those who belong to a religion, and 1.27 (SD = 1.73) for those who do not.

Quality of home neighbourhood Seventy-two percent reported feeling safe or very safe, and 6.4% reported feeling very unsafe walking along after dark in the area where they lived before coming to university. The following percentages reported having many or very many reasons to complain about: noise (8%), air pollution (8%), lack of access to green spaces (6%), water quality (4%), crime (25%) and litter (24%).

5.4.1.3 Outcome measures

Self-reported generalised trust On average, participants scored 5.02 (SD = 2.06), with females scoring slightly lower (mean = 4.82, SD = 2.10) than males (mean = 5.21, SD = 2.02). The 122 participants whose Agreeableness score remained unchanged after standardising the *trust* facet report a similar mean score (mean = 4.95, SD = 1.95), with males scoring similarly to those in N140 (mean = 5.25, SD = 1.83) but females scoring lower on average than those in N140 (mean = 4.57, SD = 2.04).

Behavioural trust Sixty-five participants (46%) chose to invest their initial endowment when playing as the Sender (i.e. to trust). This is similar to the figure reported by Ermisch et al. (2009), who implemented a game with a similar design and reported that around 40% of those playing as the Sender chose to invest their money. The slightly higher rate of investment in the present study may have been due to the lower stake (£5 versus £10) and the participants being students (Naef and Schupp [2009a] found that students show more trust than the general population; although see Naef & Schupp for a discussion of studies that found the opposite).

Behavioural trustworthiness Fifty participants (36%) were trustworthy and elected to return £10 to the Sender. Ermisch et al. (2009) reported that of those Returners who were trusted, around 50% were trustworthy. The difference in these figures may be partly due to the difference in design between the two studies, with my participants deciding how much money to return to the Sender before they knew whether the

Sender had trusted them. It is noted in the literature that being trusted may induce trustworthy behaviour (Zak, Kurzban, & Matzner, 2004). This may also have been affected by the rate of misunderstanding of the rules of the game (see Section 5.4.1.5).

Self-reported and behavioural trust

Of the 65 participants who were trusting in the trust game, 28 (43%) scored between 6 – 10 in self-reported generalised trust (where 10 = most people can be trusted). Of the 76 who were not trusting in the trust game, 35 (47%) scored between 6 – 10 in self-reported generalised trust (where 10 would indicate ‘most people can be trusted’).

Of the 63 participants who scored 6 – 10 on the GTQ (indicating an above-average level of self-reported trust), 28 (44%) invested their £5 stake when playing as the Sender. Of the 77 people who scored 0 – 5 on the GTQ (indicating low self-reported trust), 37 (48%) invested.

These results indicate that self-reported trust, as measured by the GTQ, does not differentiate between those who will and those who will not invest their initial stake when playing as the Sender in the trust game. Furthermore, those who report caution on the GTQ are marginally more likely to invest their stake during the trust game. However, this result may be due to chance differences in the proportions of

GTQ-cautious versus GTQ-trusting who played as the Sender in Game 1 (when we can reasonably expect people to show more trust). Examining the crosstabs does indeed show this to be the case: of the 72 people who played as the Sender in Game 1, 44 (61%) were GTQ-cautious. This split is not seen in those who played as the Sender in Game 2, where 49% were GTQ-cautious. Thus, the apparent nonsensical finding regarding who is and is not likely to show behavioural trust may simply be an artefact caused by random variation in the proportion of GTQ-trusting versus GTQ-cautious who were randomly assigned to be the Sender in Game 1.

Behavioural trust and trustworthiness

Of the 65 people who were trusting, 37 (57%) were also trustworthy. Of the 76 people who were not trusting, thirteen (17%) were trustworthy.

Of the fifty participants who were trustworthy in the trust game, 37 (74%) invested their £5 stake as the Sender. Of those who were not trustworthy, 31% invested.

While these findings suggest an association between behavioural trust and behavioural trustworthiness, we may again be observing an 'order of play' effect. However, examining the crosstabs for these measures appears to disconfirm this with 48% of the trustworthy, and 53% of the untrustworthy, participants playing as the Sender in Game 1.

Self-reported trust and behavioural trustworthiness

Of the fifty people who were trustworthy in the trust game, 25 (50%) scored between 6 – 10 in self-reported generalised trust. Of the ninety participants who were not trustworthy, 38 (42%) scored between 6 – 10 in self-reported trust.

Of the 63 participants who scored 6 – 10 on the GTQ, 40% were trustworthy, while of the 77 who were cautious, 33% were trustworthy.

There are small differences in the proportions of GTQ-trusting participants who were trustworthy and untrustworthy, and similar rates of trustworthiness amongst those who scored higher and lower on self-reported trust. It is not clear whether these differences would reach significance.

5.4.1.4 Personality

Here I describe the mean scores on the personality traits and facets. As above, these data refer to the sample of 140 who completed the study; any differences in the wider sample of 170 (i.e. including those who did not play the trust game) are flagged. I used the US version of the NEO-PI-3, so these categories are based on the coding system for the US population.

Table 5.3: Mean scores on NEO personality traits and facets

	N140	
	Females	Males
Neuroticism	High	High
Extraversion	Average	Average
Openness	High	High
Agreeableness	Average	Average
Conscientiousness	Low	Low
N1 Anxiety	Average	Average/ high
N2 Angry hostility	Average/ high	Average
N3 Depression	High	High
N4 Self-consciousness	Average/ high	High
N5 Impulsiveness	High	Average/ high
N6 Vulnerability	High	High
E1 Warmth	Average	Average
E2 Gregariousness	Average	Average
E3 Assertiveness	Average	Average
E4 Activity	Average	Low/ average
E5 Excitement-seeking	High	High
E6 Positive emotions	Average	Average
O1 Fantasy	High	High
O2 Aesthetics	Average	Average
O3 Feelings	Average/ high	Average/ high
O4 Actions	Average/ high	Average/ high
O5 Ideas	High	High
O6 Values	High	High
A1 Trust	Average	Low/ average
A2 Straightforwardness	Average	Average
A3 Altruism	Average	Average
A4 Compliance	Average	Average
A5 Modesty	Average	Average
A6 Tender-mindedness	Average	Average
C1 Competence	Low	Low
C2 Order	Low/ average	Low/ average
C3 Dutifulness	Low	Low/ average
C4 Achievement striving	Low	Average
C5 Self-discipline	Low	Low
C6 Deliberation	Low/ average	Average

Traits

On average the participants reported high Neuroticism (mean = 101.50, SD = 23.83), average Extraversion (mean = 115.00, SD = 23.12), high Openness (mean = 124.83, SD = 20.64), average Agreeableness (mean = 113.79, SD = 20.65) and low Conscientiousness (mean = 106.11, SD = 24.13). Similar results are obtained when the genders are analysed separately.

Facets

Neuroticism Across the sample, both male and female participants scored average or high on each facet within Neuroticism: females reported average *anxiety*, average/ high *angry hostility* and *self-consciousness*, and high *depression*, *impulsiveness* and *vulnerability*. Males reported average *angry hostility*, average/ high *anxiety* and *impulsiveness*, and high *depression*, *self-consciousness* and *vulnerability*.

Extraversion On average, participants reported between low/ average and high levels of each facet within Extraversion: females scored average on *warmth*, *gregariousness*, *assertiveness*, *activity* and *positive emotions*, and high on *excitement-seeking*. Males scored low/ average on *activity*, average on *warmth*, *gregariousness*, *assertiveness* and *positive emotions*, and high on *excitement-seeking*.

Openness Participants scored average or high on all facets of Openness: females scored average on *aesthetics*, average/ high on *feelings* and *actions*, and high on *fantasy*, *ideas* and *values*. Males scored average on *aesthetics*, average/ high on *feelings* and *actions*, and high on *fantasy*, *ideas* and *values*.⁴⁷

Agreeableness Across the sample, participants scored low/ average to high on the Agreeableness facets: females scored average on all facets (*trust*, *straightforwardness*, *altruism*, *compliance*, *modesty* and *tender-mindedness*). Males scored low/ average on *trust* and average on *straightforwardness*, *altruism*, *compliance*, *modesty* and *tender-mindedness*.⁴⁸

Conscientiousness Participants scored low – average on all facets of Conscientiousness: females scored low on *competence*, *dutifulness*, *achievement striving* and *self-discipline*, and low/ average on *order* and *deliberation*. Males scored low on *competence* and *self-discipline*, low/ average on *order* and *dutifulness*, and average on *achievement striving* and *deliberation*.⁴⁹

⁴⁷ The scores change slightly when the participants who only completed the questionnaire are included: Females and males score high on *actions*, and females score very high on *ideas*.

⁴⁸ When including the participants who only did the questionnaire, females score low on *trust*.

⁴⁹ Including all 170 questionnaire participants, females score average on *achievement-striving* and males score low/ average on *deliberation*.

Reflections

Given the homogeneity of this sample and the use of a US version of the NEO-PI-3, it is not known how these results compare to the UK average or to the average undergraduate student in the UK. The self-selection format of participant recruitment may mean that my sample is not representative of even the broader University of Essex undergraduate population that meets my participation criteria: perhaps the more free and easy students do not feel sufficiently inspired by the idea of sitting in a social sciences laboratory, while the more conscientious are too busy working. It is also possible that these scores are illustrative of the struggles that can plague one during late adolescence, and particularly when living away from home for the first time.

It is worth bearing in mind that the data quoted above are vulnerable to participants' use of the scale, although the five categories (coded *very low*, *low*, *average*, *high* and *very high*) do eliminate outliers. I recoded to these categories according to the gendered 'adult norms' specified in the NEO-PI-3 Self-Report Profile Form, after having re-coded the reverse-coded items as indicated on the NEO-PI-3 Hand-Scorable Answer Sheet.⁵⁰

⁵⁰ The NEO-PI-3 Hand-Scorable Answer Sheet and Self-Report Profile Form may be available from PAR Inc (www4.parinc.com).

Agreeableness and its trust facet

As described earlier, the Agreeableness trait comprises six facets, one of which is called *trust*. When predicting self-reported generalised trust, any observed effect for Agreeableness could be driven by this *trust* facet (which is likely to correlate highly with the outcome measure). To investigate and negate this effect I have generated an alternative Agreeableness trait score for each participant, which includes a standardised *trust* score (set to the mean score on this facet) in place of their real score. As part of the Agreeableness trait score, this effectively renders the *trust* facet inconsequential in the regression analyses. Clearly, however, for those participants who had originally scored particularly low or high on *trust*, assigning the mean may have altered their Agreeableness score; artificially raising it for those low on *trust*, or lowering it for those high on *trust*. Since their score on the outcome measure will not have been similarly adjusted this will introduce additional, uncontrolled error into the observed relationship between Agreeableness and the outcome measure.

To avoid corrupting the relationship between Agreeableness and the outcome measure, I use in these analyses only those participants whose Agreeableness score (when coded from 1 – 5) remained unchanged when using this standardised *trust* facet score. This results in a subset of 122 of the original 170 questionnaire participants; 101 of these 122 people participated in the full experiment, while 21 were questionnaire-only participants. Unfortunately, this does mean that I am not excluding participants at random but disproportionately excluding those who had scored very low, high or very high on the *trust* personality facet. However, this does

permit investigation of the effect of trait Agreeableness when the *trust* facet is removed from the analyses. In discussing the results of my main analyses, I report the findings for this subset of 122 people in comparison to those for the 140 who are the main focus for the results.

5.4.1.5 Additional variables

Positive reciprocity On average, participants reported high levels of positive reciprocity (mean = 5.90, SD = .84) with a range of scores from 2.67 to 7.

Negative reciprocity Across the sample, participants reported moderate levels of negative reciprocity (mean = 3.03, SD = 1.14) with a range from 1 to 7.

Attitude towards risk Willingness to take risks was measured on a 0 – 10 scale, where 0 represents “not at all willing to take risks”, and 10 represents “very willing to take risks”. On average, participants scored 6.17 (SD = 1.98). Responses on the battery of items measuring willingness to take risks in different contexts generated a range of results. On average, they reported being least willing to take risks while driving (mean = 2.33, SD = 2.27), financially (mean = 3.41, SD = 2.29) and with their health (mean = 3.74, SD = 2.82) and more willing to take risks with their occupation (mean = 4.79, SD = 2.32) and faith in people (mean = 5.50, SD = 2.26), and most willing to take risks during leisure activities (mean = 7.03, SD = 1.94).

Betrayal aversion (measured during the game session) Betrayal aversion was measured during the trust game session as described in Section 5.2.2.3 above. A positive score indicates that the person has an aversion to betrayal. On average, participants scored -1.07 (SD = 22.33), with a range from -50 to 70.

Reason for decision as the Sender (qualitative) Of the 65 participants who chose to invest the money, 39 (60%) cited an other-regarding reason – for example, “to maximise both our payoffs” or “to give player 2 an opportunity to take away some money”. Five (13%) of those people were keen just to help their game partner and/or to bring more money into the game, and did not appear concerned about whether they would receive money in return.

Reason for decision as the Returner (qualitative) Of the fifty people who were trustworthy, 43 (86%) cited an other-regarding reason (such as “I feel player 1 should be rewarded” or “I wanted both of us to leave with some money”). Of the ninety participants who elected to keep the £15 (i.e. who were not trustworthy), 25 (28%) indicated that they had misunderstood the rules of the game or were working from otherwise faulty logic (mainly along the lines of “I did not trust them to invest in the first place”); I suspect they thought this was a prisoner’s dilemma game, where the two players have to make compatible decisions in order to not be penalised (presumably the equivalent here would be: invest/ return £10; not invest/ return £0). In addition, two players who elected to return £10 appeared to have made a similar mistake, however, they felt it worth the risk to return £10 (“I trusted player 1 to invest in me, and they did”, and “I felt generous doing this but it required

trusting someone else to share with no guarantees”). The instructions were provided in print and read out; presumably, either the participants had not been concentrating or the instructions were not clear enough.

Donation to charity Almost 50% of the participants made a donation to charity: thirty-eight (27.0%) participants donated fifty pence, 23 (16.3%) donated £2.50, two (1.2%) donated £2 and one (.6%) each donated £1 and £1.50 and £22.50.

5.4.1.6 Confounding factors

Below, I describe the distribution of participants across these session characteristics, discussing in more detail (in Section 5.4.2) those variables that can be evaluated without being confused with other session characteristics.

Session size - questionnaire The questionnaire data was collected in 29 sessions and session size varied between one and eighteen participant(s) with the following proportions of participants in groups of each size: one person (1%), two people (1%), three people (14%), four (7%), five (6%), six (6%), seven (14%), eight (3%), nine (12%), ten (12%), eleven (6%), fourteen (10%), and eighteen (9%)⁵¹.

⁵¹ Due to rounding, these proportions may not add up to 100%.

Session size - trust game There were eighteen trust game sessions: twenty-six percent of respondents attended sessions involving six people, 21% attended those holding eight people, 33% ten people, 9% twelve people and 11% sixteen people.

Time in the academic year Around 44% of the cases were collected in the Autumn term, 41% in the Spring term and 15% in the Summer term. Nine percent of cases were collected close to Christmas.

Time in the term – questionnaire Eleven percent of cases were collected in the first three weeks of a term, 66% during the middle four weeks and 23% towards the end of term (final few weeks).

Time in the term – trust game Eleven percent of cases were collected in the first three weeks of a term, 63% during the middle four weeks and 26% towards the end of term.

Time of day - questionnaire Seventeen percent of questionnaires were started before 11:30am, 20% between midday – 13:30, 53% between 14:00 – 15:30 and 10% at 16:00 or later.

Time of day – trust game Thirteen percent of cases attended game sessions that started up until 11:30am, 35% between midday and 13:30, 49% between 14:00 – 15:30, and finally 3.6% at 16:00 or later.

Unofficial participant Fifteen percent of trust game participants were asked to sign a form indicating awareness that an unofficial participant would join the session. With only fourteen people in this category, there are too few to statistically evaluate any unintended effect.

Double show-up fee Approximately 40% of participants signed up to the study while a double show-up fee was on offer.

Proportion who played Game 1 as the Sender Seventy-two (42%) participants played the first game as the Sender. This is lower than the 50% one would expect, due to the presence of stand-in participants when I did not have the right number of participants to run the session (as mentioned above). These extra participants' data is not included in these analyses.

While each of these variables may potentially have influenced participants' responses and behaviour, the distribution of participants would make controlling for them unviable; for example, to account for session size and time of day would result in some groups having very low numbers of participants. Due to the self-selection nature of these sessions, it would also be impossible to distinguish any apparent session effects from true interpersonal differences (for example, those who signed up for a session at 9am on a Monday may be different to those who signed up for a session at 11am or 2pm). In Section 5.4.3 I therefore test the influence of just two of these variables: the award of a double showup fee and whether the participant played their first round of the trust game as the Sender or Returner.

5.4.2 Preliminary analyses

The goal of this study is to investigate the relationship between personality and generalised trust, and to attempt to unpick the relationships between self-reported generalised trust and behavioural trust and trustworthiness as measured via the trust game. Here I examine the relationships between personality and some potential control variables, and also the experimental measures of betrayal aversion and charity donation. I then take an initial look at the correlations between my three trust-related outcome measures.

5.4.2.1 Preliminary models: moderating variables

Here I discuss the results of the preliminary regression models that were designed to test (a) whether the potential control variables are themselves associated with personality (and thus should be excluded from the analyses), and (b) whether those that are not associated with personality are significantly predictive of the outcome measures.⁵²

The personality traits are scaled such that a higher score indicates the individual identifies more strongly with it. Table 5.4 below shows the unstandardised

⁵² In bivariate correlation analyses, none of these variables were so highly correlated with any other measure as to indicate multicollinearity.

coefficients, the standard errors and effect size (r) for each personality trait as a predictor of each control and experimental variable. The bottom row gives the proportion of the variance that is accounted for by each model. Below, I discuss the results of each of these in turn.

Table 5.4: Control variables and experimental measures (unstandardised coefficient (standard error) *effect size/ standardised coefficient*)

	Willingness to take risks	Positive reciprocity	Negative reciprocity	Financial insecurity	Game 1 as Sender	Double show- up fee	Betrayal aversion	Charity donation
Neuroticism	-.55 (.17) -.26	-.03 (.08)	-.03 (.10)	.31 (.09) .29	1.00 (.20)	.88 (.21)	-.70 (2.19)	.06 (.08)
Extraversion	.30 (.16)	.09 (.07)	.20 (.09) .18	.11 (.09)	.85 (.19)	1.02 (.20)	-1.40 (2.04)	-.12 (.08)
Openness	.54 (.17) .27	<u>.14</u> (.07) .17	-.08 (.09)	.09 (.09)	1.31 (.20)	1.41 (.21)	-.12 (2.10)	.11 (.08)
Agreeableness	<u>-.28</u> (.14) -.16	.14 (.06) .19	-.47 (.08) -.47	-.05 (.08)	<u>.73</u> (.16) .09	1.12 (.17)	-2.79 (1.77)	.29 (.07) .36
Conscientiousness	-.27 (.15)	.20 (.06) .25	-.08 (.08)	-.09 (.08)	1.15 (.17)	1.07 (.19)	-.65 (1.89)	-.01 (.07)
R ²	.22	.19	.27	.13	.05	.05	.03	.17

Bold text indicates coefficient significant at $p < .05$ or lower; underlined indicates borderline significance ($.05 \leq p \leq .06$).

These models do not control for demographic variables (age, gender, year of study).

*Potential control variables**Willingness to take risks (higher score indicates more willing to take risks)*

A higher level of Openness is associated with being more willing to take risks, while a higher level of Neuroticism is associated with being less willing to take risks. Agreeableness demonstrates a borderline significant association, such that a higher level of Agreeableness is associated with a lower willingness to take risks ($p \leq .06$). Overall, personality traits account for 22% of the variance in willingness to take risks. Controlling for demographic variables resulted in the same associations, except for a significant effect of Extraversion (.32 [.16] .17) and a non-significant effect of Agreeableness (-.25 [.14] -.15).

Positive reciprocity (higher score indicates higher level of positive reciprocity)

Reporting a higher level of positive reciprocity is associated with scoring higher on Agreeableness and Conscientiousness. A higher level of positive reciprocity is also marginally associated with a higher level of Openness. Personality accounts for 19% of the variance in positive reciprocity. Controlling for demographic variables generated very similar results, except for a significant effect of Openness (.15 [.07] .18).

Negative reciprocity (higher score indicates higher level of negative reciprocity)

A higher level of negative reciprocity is associated with a significantly lower level of Agreeableness. Personality accounts for 27% of the variance in negative reciprocity. Controlling for demographic variables did not result in any changes to these findings.

Financial insecurity (higher score indicates greater difficulty n household income)

A higher level of financial insecurity is significantly associated with a higher score on Neuroticism. It is not clear whether those who are higher in Neuroticism are more likely to report financial difficulties, or if those who are experiencing financial difficulties are more likely to score higher on Neuroticism. This effect persists when controlling for age, gender and year of study.

Game 1 as Sender (= 1; 0 = *Played Game 1 as the Returner*)

Given that this variable was manipulated at random during the second session, it cannot have a meaningful relationship with participants' personality. However, by chance, there is a marginal effect such that participants who were higher in Agreeableness were slightly less likely to play Game 1 as the Sender ($p \leq .06$). Reassuringly, personality accounts for only 5% of the variance in likelihood of playing Game 1 as the Sender. A model that controlled for age, gender and year of study resulted in similar findings – except for a significant effect of Agreeableness (.70 [.17] .10).

Double show-up fee As anticipated, the receipt of a double show-up fee is not associated with any personality traits. This indicates that – at least at the trait level – there was no coincidental clustering of personality scores within payment 'condition'. Controlling for demographic variables did not change these findings.

Experimental variables

I included a measure of betrayal aversion and the opportunity to make a donation to charity in part to test how these items would function. If their associations with personality make sense theoretically, this would lend support to the conclusion that these items may have worked well (although further testing should be carried out in other studies). In neither case did controlling for demographic variables change the findings.

Betrayal aversion (positive score indicates an aversion to betrayal; a higher score meaning stronger aversion)

This measure did not show any significant relationships with personality variables. Significant relationships would have been expected had this variable truly measured betrayal aversion. In fact, personality accounts for just under 3% of the variance in this measure and testing a full set of models for this variable reveals no facet associations.

Charity donation

The dataset for this model excludes an upper outlier (£22.50) by recoding it to match the next highest amount donated, £2.50. This model indicates that the Big Five personality traits account for just under 17% of the variance in the amount of money one donates to charity, with Agreeableness demonstrating the only significant association. This makes sense given the prosociality of those with high Agreeableness.

5.4.2.2 Reflections

Potential control variables

As noted above, personality accounts for 19 – 27% of the variance in positive reciprocity, risk aversion and negative reciprocity. If included alongside the personality variables in my regression models, these would be likely to mask the actual relationship between personality and the outcome measures. I therefore exclude these variables from my models.

Financial insecurity is a variable that could moderate the relationship between personality and the trust-related outcome variables, since fewer resources may make one more inclined to be cautious rather than trusting (and perhaps less likely to transfer money in the trust game). Examining the correlations for this variable reveals a significant positive association with trait Neuroticism and five of the Neuroticism facets (*angry hostility, depression, self-consciousness, impulsiveness* and *vulnerability*) and with the *feelings* facet of Openness. In addition, it reports a significant negative relationship with trait Conscientiousness and four Conscientiousness facets (*competence, order, dutifulness* and *self-discipline*). With this balance of associations, it appears that this may not be a straightforward case of “financial insecurity makes you anxious”; I therefore exclude this variable from my

main analyses (although see Appendix 5F for a table of results from models that include it).

Experimental variables

My measure of betrayal aversion is not significantly associated with any of the personality traits. It is therefore not clear whether this item operates as a functional measure of betrayal aversion. Inspection of the correlation analyses (Appendix 5C) shows that it does correlate negatively with behaviour as the Sender ($\rho = -.18, p < .05$), indicating that those who score higher on betrayal aversion are less likely to invest their initial £5 stake when playing as the Sender. While this makes sense intuitively, I would have expected to see some correlation with personality measures (such as Neuroticism's *angry hostility* or *vulnerability*). Due to the question marks over this measure I exclude it from my models.

Order of play (having played Game 1 as the Sender) is not significantly associated with personality, however it does significantly correlate with behavioural trust ($\rho = .22, p = .01$); those who play their first round of the trust game as the Sender are significantly more likely to invest their £5 stake than are those who had played first as the Returner. It is therefore important to control for this effect in my models. .

The payment of a double show-up fee to some participants does not appear to have generated any coincidental associations with personality, with this variable

demonstrating no significant relationships with personality traits. Examination of the correlation coefficients however does show significant associations with *feeling* ($\rho = .19, p < .05$) and *ideas* ($\rho = .18, p < .05$; both from the Openness trait) and *altruism* (Agreeableness; $\rho = .18, p < .05$).

Of these potential control variables, the established self-report measures show significant associations with personality and are to be excluded from the main models. This leaves two to check in preliminary regression analyses, to test whether they do have a significant association with the outcome measures: order of play and the payment of a double show-up fee (see Section 5.4.3 below).

In the next section, I look briefly at the correlations between the personality variables and between the trust-related outcome measures. I then briefly consider the utility of the positive and negative reciprocity measures, before turning to my initial regression models.

5.4.2.3 Correlations between personality traits and facets

A brief examination of the correlation matrix (Appendix 5C) reveals significant inter-trait correlations at the trait and facet levels. Given the nature of personality, this is to be expected and it does fit with the indications from the existing literature (as discussed in Section 5.1.2). However, it should be borne in mind when considering the results discussed in Section 5.4.3 that any observed effects are likely to vary

depending on the combination of personality variables that are included in the model.

5.4.2.4 Correlations between self-reported trust, behavioural trust and trustworthiness

Consistent with previous studies, self-reported trust did not correlate with behavioural trust ($\rho = .01$, *ns*). However, it also correlated only weakly (and non-significantly) with behavioural trustworthiness ($\rho = .14$, *ns*). Behavioural trust and trustworthiness demonstrated a moderate correlation, $\rho = .41$ ($p < .001$).

In the section below, I investigate the degree of support shown in my data for the use of positive and negative reciprocity as proxy measures, for trustworthiness and betrayal aversion (respectively).

5.4.2.5 Positive and negative reciprocity

In Section 5.2.1.1 I note that positive reciprocity may be associated with trustworthiness, and negative reciprocity with betrayal aversion. An independent groups t-test, where trustworthiness is the grouping variable and positive reciprocity score the dependent variable, revealed that on average those who were trustworthy

reported significantly higher level of positive reciprocity than those who were not trustworthy ($t = 2.68$, $df = 128$, $p < .05$; $r = .23$. 95% CI = .09 - .62). This association is however weaker than one might expect from a reliable proxy measure. Meanwhile, negative reciprocity and betrayal aversion achieve only a non-significant correlation ($\rho = .08$, ns). This is not surprising, given the uncertainty regarding this measure of betrayal aversion. For the present data, therefore, positive and negative reciprocity could not be recruited as proxy measures for trustworthiness and betrayal aversion. However, further investigation should be undertaken with different samples (and perhaps a revised measure of betrayal aversion).

5.4.3 Regression models

My preliminary models are limited to testing for the effects of being paid a double show-up fee and of playing Game 1 as the Sender. Examining the correlations (self-reported trust) and t-test statistics (behavioural trust and trustworthiness) between these variables and each outcome measure reveals only one significant association: those who played Game 1 as the Sender were significantly more likely to show behavioural trust ($\phi = .22$, $p \leq .01$).

Here I test whether this variable adds anything to the model when tested alongside personality as a predictor of behavioural trust. As can be seen in Table 5.4 below, Model B3 (which accounts for having played Game 1 as the Sender) explains 22% of the variance in behavioural trust, while the personality traits alone account for 16%.

Controlling for demographic variables (age, gender and year of study) did not change the results, but does make the model account for 29% of the variance in total.

Receiving a double show-up fee does not appear to influence behaviour in the trust game when playing as the Sender (OR = 1.17, *ns*) or the Returner (OR = 1.40, *ns*); this result does not change when excluding those who appeared to misunderstand the rules of the game (OR = 1.47, *ns*).

Tables 5.5 – 5.8 below display the regression coefficients for the series of models that evaluated the extent to which personality predicts each of the three outcome measures. I report and discuss these in turn, starting with self-reported trust.

Table 5.5: Regression models – personality traits and moderator variables

	Self-reported trust ^a (B (SE), effect size r)				Behavioural trust (N140) (OR (SE), effect size r)			
	N170	N140	N122	A1	A2	A3	A4	
Double show-up fee					1.17 (.40)			
Game1AsSender						2.75 (.38) .27	3.12 (.42) .30	
Neuroticism	-.43 (.16) .21	-.40 (.19) .19	-.54 (.22) .25	.76 (.22)	.76 (.22)	.74 (.22)	.78 (.23)	
Extraversion	.25 (.15) .13	.37 (.18) .19	.06 (.19)	.65 (.20) .12	.65 (.20) .12	.66 (.21) .11	.65 (.22) .12	
Openness	-.07 (.17)	-.04 (.18)	.04 (.20)	1.98 (.22) .19	1.96 (.22) .18	1.91 (.22) .18	2.11 (.23) .20	
Agreeableness	.63 (.14) .35	.57 (.15) .31	.46 (.20) .23	1.23 (.17)	1.23 (.17)	1.35 (.18)	1.41 (.19)	
Conscientiousness	-.29 (.15) .15	-.30 (.16)	-.29 (.18)	.80 (.18)	.80 (.18)	.77 (.19)	.79 (.20)	
R ²	.20 (.19 ^b)	.21 (.19 ^b)	.14 (.10 ^b)	.16 ^c	.17 ^c	.22 ^c	.29 ^c	

	Behavioural trustworthiness (N140) (OR (SE), effect size r)				Behavioural trustworthiness (N112) (OR (SE), effect size r)			
	B1	B2	B3	B4	C1	C2	C3	C4
Double show-up fee		1.40 (.40)				1.47 (.45)		
Game1AsSender			.90 (.38)				1.04 (.41)	
Neuroticism	.75 (.21)	.75 (.21)	.75 (.21)	.72 (.24)	.83 (.23)	.84 (.23)	.83 (.23)	.80 (.25)
Extraversion	.85 (.20)	.85 (.20)	.85 (.20)	.84 (.22)	.97 (.22)	.97 (.22)	.97 (.22)	.89 (.24)
Openness	1.27 (.21)	1.24 (.21)	1.28 (.21)	1.33 (.23)	1.21 (.23)	1.18 (.23)	1.21 (.23)	1.29 (.25)
Agreeableness	1.63 (.18) .13	1.62 (.18) .13	1.62 (.18) .13	1.91 (.20) .18	1.62 (.19) .13	1.60 (.19) .13	1.62 (.19) .13	1.91 (.22) .18
Conscientiousness	.76 (.19)	.75 (.19)	.76 (.19)	.75 (.21)	.76 (.20)	.76 (.21)	.76 (.20)	.83 (.23)
R ²	.13 ^c	.14 ^c	.13 ^c	.29 ^c	.13 ^c	.14 ^c	.13 ^c	.30 ^c

^a Models control for age, gender and year of study. ^b R² when age, gender and year of study excluded from model. ^c Nagelkerke R Square.

N122 includes only participants whose Agreeableness score remained unchanged after standardising the *trust* facet across all participants.

N112 excludes participants who misunderstood the rules of the game. Models C4, D4 and E4 control for age, gender and year of study.

Bold text indicates coefficient significant at $p < .05$ or lower; underlined indicates borderline significance ($.05 \leq p \leq .06$).

5.4.3.1 Predicting self-reported generalised trust

As far as I am aware, this study is the first to use the full NEO personality inventory to test the relationship between personality and self-reported generalised trust. Table 5.6 shows the results of the series of regression models that assess the extent to which the Big Five traits and facets predict self-reported trust (significant p -values indicated by bold text; borderline significant [$.05 \leq p \leq .06$] coefficients underlined).

Table 5.6 gives results for participants who completed both the questionnaire and the trust game (N140), and participants whose trait Agreeableness score remained unchanged after the *trust* facets was standardised to exclude it from this trait in the regression analyses (N122; see Appendix 5D for results for the full sample of questionnaire participants, N170). Analyses for N140 and N170 use the full, unadjusted Agreeableness trait score, while those for N122 use the Agreeableness score that incorporates the standardised *trust* facet.

The trait coefficients are those obtained when the five traits are the only personality variables in the model, while the coefficient given for each facet is that obtained when it replaces its parent trait in the regression model alongside the other four personality traits. In the text below I describe the results obtained from the models using N140, however, I do flag any differences that are observed when using N122.

Research question 1 asked which personality traits and facets are associated with self-reported generalised trust.

Hypothesis 1 predicted a positive relationship between Agreeableness and self-reported generalised trust. As seen in Table 5.6, this expectation was supported by the data ($B = .57, p < .001; r = .31$), with a unit increase in Agreeableness associated with a .57 increase in self-reported trust, however, the relationship between Agreeableness and self-reported trust does vary depending on which facet was specified in the model. Similar effects were observed in the N122 subsamples and in models that did not control for demographic variables.

The finding of a positive relationship makes sense theoretically, as discussed earlier. Of the two previous studies that examined the personality predictors of self-reported trust, one reported a significant association for Agreeableness (Dohmen et al., 2008). However, this trait achieved a very low effect size which suggests the significance of the coefficient may have been due to the large sample size. In the NEO-PI-3, Agreeableness does hold the facet *trust*. I have retained the *trust* facet to avoid disrupting the coding thresholds, however, while this may have some effect on the coefficients it should not exert a massive influence given that it is only one of six facets that sum to determine the Agreeableness score (and that these scores are re-coded to a 5-point scale before analysis).

Hypothesis 2 predicted that Extraversion should be positively associated with self-reported trust. Extraversion significantly predicted self-reported trust ($B = .37, p <$

.05; $r = .19$), although its relationship with the outcome measure did vary across the facet models. As shown in Table 5.6, this effect was maintained when demographic variables were excluded from the model, but not when using the adjusted Agreeableness trait (N122; $B = .06$, *ns*).

Both previous regression studies (Dohmen et al., 2008; Albanese et al., 2013) reported a non-significant effect of Extraversion on self-reported trust. Clearly, the more thorough measure of Extraversion did not reveal any outright significant association, although some significant (though weak) effects were unearthed. Examining just the correlations, Becker et al. (2012) reported a significant association between Extraversion and self-reported trust, although at $r = .09$ this was just below the value accepted as equating to a weak effect size.

Hypothesis 3 postulated that Neuroticism would be negatively associated with self-reported trust. As shown in Table 5.5, Neuroticism did have a significant negative association with generalised trust ($B = -.40$, $p < .05$; $r = -.19$), such that a unit increase in Neuroticism was associated with a .40 drop in self-reported trust. A similar effect is observed in the N122 subsample, irrespective of whether demographic variables are included in the model. The finding of a negative association between Neuroticism and self-reported trust echoes the findings from previous studies (Dohmen et al., 2008; Albanese et al., 2013; Becker et al., 2012).

Conscientiousness was not associated with self-reported trust when demographic variables were included in the model. Excluding demographics (and using N140 and

thus the full Agreeableness trait), Conscientiousness significantly predicted self-reported generalised trust ($B = -.32, p < .05; r = -.17$). This effect was not quite significant in the reduced sample N122. Openness was not significantly associated with self-reported trust in any of the trait or facet models.

In both of the previous regression studies, Conscientiousness was found to significantly predict self-reported trust. However, in one of these (Dohmen et al., 2008) the coefficient seems small enough to suggest its significance may be driven by sample size. Albanese et al. (2013) reported a coefficient of $-.100 (p < .01)$, however, it is not clear whether this is the standardised or unstandardised coefficient and whether it would be large enough to offer even a weak effect.

Table 5.6: Coefficients for NEO-PI-3 variables when predicting self-reported GTQ score (unstandardised coefficients (SE), *effect size r*)

	N140		N122	
	With demog.	No demog.	With demog.	No demog.
Neuroticism	-.40 (.19) -.19	-.41 (.19) -.19	-.54 (.22) -.25	-.51 (.22) -.23
Extraversion	.37 (.18) -.19	.35 (.17) .18	.06 (.19)	.07 (.19)
Openness	-.04 (.18)	-.03 (.18)	.04 (.20)	.05 (.19)
Agreeableness	.57 (.15) .31	.58 (.15) .32	.46 (.20) .23	.47 (.19) .23
Conscientiousness	-.30 (.16)	-.32 (.16) -.17	-.29 (.18)	-.31 (.17)
N1 Anxiety	-.31 (.18)	-.32 (.18)	-.25 (.21)	-.21 (.20)
N2 Angry hostility	-.17 (.18)	-.19 (.17)	-.20 (.19)	-.22 (.18)
N3 Depression	-.65 (.20) -.28	-.67 (.20) -.29	-.73 (.23) -.34	-.73 (.22) -.34
N4 Self-consciousness	-.19 (.19)	-.21 (.19)	-.16 (.21)	-.14 (.20)
N5 Impulsiveness	-.37 (.21)	-.41 (.20) -.18	-.52 (.23) -.23	-.58 (.23) -.25
N6 Vulnerability	-.39 (.18) -.19	-.41 (.18) -.20	-.62 (.21) -.29	-.62 (.21) -.29
E1 Warmth	.23 (.18)	.23 (.17)	-.05 (.20)	.02 (.19)
E2 Gregariousness	.19 (.15)	.18 (.15)	.09 (.16)	.10 (.16)
E3 Assertiveness	.22 (.18)	.16 (.17)	.17 (.20)	.07 (.19)
E4 Activity	.09 (.18)	.07 (.18)	-.09 (.19)	-.09 (.19)
E5 Excitement-seeking	.11 (.19)	.10 (.18)	-.04 (.21)	-.10 (.21)
E6 Positive emotions	.38 (.17) .22	.39 (.16) .22	.15 (.19)	.21 (.18)
O1 Fantasy	-.22 (.18)	-.21 (.17)	-.16 (.19)	-.18 (.18)
O2 Aesthetics	.05 (.16)	.05 (.15)	.12 (.16)	.12 (.16)
O3 Feelings	.07 (.17)	.03 (.16)	.20 (.17)	.16 (.17)
O4 Actions	.06 (.18)	.07 (.17)	-.18 (.18)	-.14 (.17)
O5 Ideas	-.02 (.17)	-.02 (.17)	.17 (.19)	.13 (.19)
O6 Values	-.01 (.21)	.02 (.20)	.12 (.22)	.17 (.21)
A1 Trust	1.24 (.13) .67	1.24 (.13) .67	1.16 (.15) .59	1.17 (.15) .59
A2 Straightforwardness	.24 (.17)	.24 (.16)	.21 (.18)	.17 (.18)
A3 Altruism	.19 (.21)	.23 (.21)	.47 (.23) .20	.49 (.23) .21
A4 Compliance	.21 (.15)	.20 (.15)	.09 (.16)	.10 (.16)
A5 Modesty	.08 (.16)	.07 (.15)	-.02 (.17)	-.04 (.17)
A6 Tender-mindedness	.34 (.19)	.30 (.18)	.13 (.20)	.18 (.19)
C1 Competence	-.05 (.19)	-.05 (.18)	-.04 (.21)	-.03 (.20)
C2 Order	-.33 (.14) -.19	-.34 (.14) -.19	-.30 (.16)	-.32 (.16) -.18
C3 Dutifulness	-.29 (.19)	-.32 (.18)	-.13 (.19)	-.16 (.19)
C4 Achievement striving	-.30 (.14) -.18	-.33 (.14) -.20	-.36 (.15) -.22	-.40 (.15) -.25
C5 Self-discipline	-.15 (.17)	-.20 (.17)	-.13 (.20)	-.19 (.19)
C6 Deliberation	-.08 (.18)	-.11 (.18)	.01 (.19)	-.03 (.19)

Bold font indicates coefficient significant at $p \leq .05$; underlined coefficient indicates borderline significance ($.05 < p \leq .06$).

Demographic variables included were age, gender and year of education: these were all non-significant in every model except for N122, where gender was borderline significant ($p = .057$).

N140: total sample of participants who completed the questionnaire and the trust game; model uses the full Agreeableness trait, with facet A1 (*trust*) intact.

N122: subsample of N170; model uses the adjusted Agreeableness trait, with facet A1 (*trust*) standardised to its mean and thereby excluded from these analyses.

Trait coefficients (Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness): association with GTQ when traits are the only personality variables in the model (i.e. no individual facets included).

Facets: coefficient indicates association with GTQ when this facet replaces its parent trait in the model (e.g. the coefficient for N1 [Anxiety] indicates the association between N1 and GTQ when N1 replaces Neuroticism in the model alongside Extraversion, Openness, Agreeableness and Conscientiousness).

Facets Using the N140 subsample, and controlling for demographic variables, six facets significantly predicted self-reported trust. Two belong to Neuroticism (*depression*, $B = -.65$, $p < .01$; $r = -.28$ and *vulnerability*, $B = -.39$, $p < .05$; $r = -.19$) and are associated, respectively, with a .65 and .39 drop in self-reported trust per unit increase in score on the relevant facet. The remaining facets that show significant associations with self-reported trust are *positive emotions* (Extraversion. $B = .38$, $p < .05$; $r = .22$) and *trust* (Agreeableness. $B = 1.24$, $p < .007$; $r = .67$) and two Conscientiousness facets, *order* ($B = -.33$, $p < .05$; $r = -.19$) and achievement striving ($B = -.30$, $p < .05$; $r = -.18$). These indicate an increase of .38 in self-reported trust per unit increase in *positive emotion*, an increase of 1.24 per unit increase in *trust*, and a drop of .33 and .30 respectively per unit increase in the remaining two facets. While trait Agreeableness is associated with self-reported trust, these analyses show that *trust* is the only Agreeableness facet to have a significant effect. When not controlling for demographic variables, a significant effect is also observed for *impulsiveness* (Neuroticism).

As shown in Table 5.6, excluding the *trust* facet from the Agreeableness trait (N122) results in significant effects for *depression*, *impulsiveness* and *vulnerability* (Neuroticism), *trust* and *altruism* (Agreeableness), *order* and *achievement-striving* (Conscientiousness). The heightened effects (relative to N140) for *vulnerability* and *altruism* appear due to the nature of the subsample, which is similar on self-reported trust but higher in *vulnerability* and lower in *altruism*. The lack of a

significant effect for *positive emotion* appears to be due to disproportionate representation of ‘average’ scores on this facet and fewer cases scoring ‘very high’.

One of the previous predictive studies reports a significant effect of Agreeableness (Dohmen et al., 2008), and Becker et al. (2012) report a significant correlation with self-reported trust. This is interesting, given that their measure of personality (the fifteen-item BFI-S) does not ask about trust but just asks the following three items, each beginning “I see myself as someone who...”: (1) “... is sometimes rude to others”, (2) “... has a forgiving nature”, and (3) “... is considerate and kind to almost everyone”. Logically, it would make sense that these three descriptions would apply to somebody who trust others. Similarly to the three-item social trust scale (as described in Chapters 2 and 3), the items measuring the NEO *trust* facet measure one’s beliefs about other people in general rather than about known others (for example, “I believe that most people are basically well-intentioned”; McCrae & Costa, 2010: 106). However, while I find that *trust* is the only Agreeableness facet to show an association with self-reported trust, it is clearly possible that the overall state of ‘being agreeable’ is associated with being more trusting.

The negative effect of the Neuroticism facets, and the positive effect of *positive emotions* fits with Smillie’s (2008) Approach/ Avoidance model.

5.4.3.2 Predicting behavioural trust

The coefficients for the regression of personality on behavioural trust are displayed below in Table 5.7.

Research question 2 asked which traits and facets predict behavioural trust.

Traits As reported in Table 5.7, Extraversion ($OR = .65, p < .05; r = .12$) and Openness ($OR = 2.11, p < .001; r = .20$) were significantly associated with behavioural trust, indicating that a unit increase in Extraversion or Openness is associated with, respectively, .65 and 2.11 times the likelihood of investing £5 when playing as the Sender (i.e. demonstrating trust during the trust game). Similar effects are found for these two traits when demographic variables are excluded from the model.

From the results of an experimental study, Becker et al. (2012) report significant correlations between behavioural trust and Openness but also Agreeableness and Conscientiousness. Conversely, Müller and Schwieren (2012) found significant correlations for Neuroticism and Agreeableness, with significant effects in regression analysis for Neuroticism, Agreeableness and Conscientiousness (see Sections 5.1.3.2.2 and 5.1.3.2.3 for information about their model and coefficients).

Table 5.7: Coefficients for NEO-PI-3 variables when predicting behavioural trust and trustworthiness (odds ratio (SE) *effect size r*)

	Behavioural trust		Behavioural trustworthiness	
	With demog.	No demog.	With demog.	No demog.
Neuroticism	.78 (.23)	.74 (.22)	.72 (.24)	.75 (.21)
Extraversion	.65 (.22) .12	.66 (.21) .11	.84 (.22)	.85 (.20)
Openness	2.11 (.23) .20	1.91 (.22) .18	1.33 (.23)	1.27 (.21)
Agreeableness	1.41 (.19)	1.35 (.18)	1.91 (.20) .18	1.63 (.18) .13
Conscientiousness	.79 (.20)	.77 (.19)	.75 (.21)	.76 (.19)
N1 Anxiety	.87 (.22)	.82 (.21)	.91 (.22)	.85 (.20)
N2 Angry hostility	1.22 (.21)	1.07 (.19)	.93 (.23)	1.00 (.19)
N3 Depression	.91 (.25)	.87 (.24)	.82 (.26)	.82 (.24)
N4 Self-consciousness	.68 (.24)	.61 (.23) .14	.77 (.23)	.72 (.22)
N5 Impulsiveness	.83 (.26)	.82 (.24)	.53 (.27) .17	.71 (.23)
N6 Vulnerability	.56 (.25) .16	.59 (.22) .14	.72 (.23)	.80 (.20)
E1 Warmth	.50 (.24) .19	.53 (.22) .17	.98 (.22)	.77 (.21)
E2 Gregariousness	.52 (.20) .18	.53 (.19) .17	.68 (.19) .11	.73 (.21)
E3 Assertiveness	1.18 (.21)	1.20 (.20)	1.24 (.23)	.84 (.21)
E4 Activity	.99 (.20)	.95 (.20)	.97 (.22)	.79 (.21)
E5 Excitement-seeking	.91 (.21)	.88 (.21)	.87 (.23)	.90 (.21)
E6 Positive emotions	.72 (.20)	.74 (.19)	.73 (.22)	.77 (.19)
O1 Fantasy	<u>1.55</u> (.23) .12	1.42 (.21)	1.27 (.23)	1.16 (.21)
O2 Aesthetics	1.78 (.19) .16	1.75 (.19) .15	1.28 (.19)	1.29 (.18)
O3 Feelings	1.77 (.21) .16	1.60 (.19) .13	1.30 (.21)	1.22 (.19)
O4 Actions	1.08 (.20)	1.00 (.19)	1.19 (.22)	1.11 (.20)
O5 Ideas	1.60 (.21) .13	1.53 (.20) .12	1.19 (.21)	1.17 (.20)
O6 Values	.70 (.24)	.78 (.22)	.75 (.27)	.90 (.23)
A1 Trust	1.22 (.21)	1.20 (.19)	1.75 (.21) .15	1.53 (.18) .12
A2 Straightforwardness	1.34 (.20)	1.32 (.19)	1.63 (.21) .13	1.50 (.19) .11
A3 Altruism	1.44 (.25)	1.41 (.24)	2.01 (.26) .19	<u>1.55</u> (.23) .12
A4 Compliance	1.40 (.18)	1.33 (.17)	1.66 (.19) .14	1.46 (.17) .10
A5 Modesty	1.26 (.19)	1.28 (.17)	1.32 (.19)	1.37 (.17)
A6 Tender-mindedness	.95 (.22)	.85 (.21)	1.50 (.22)	1.17 (.20)
C1 Competence	.97 (.22)	.89 (.21)	.98 (.23)	.87 (.21)
C2 Order	.89 (.18)	.88 (.17)	.81 (.19)	.81 (.17)
C3 Dutifulness	.94 (.22)	.87 (.21)	1.01 (.23)	.95 (.21)
C4 Achievement striving	.98 (.17)	.93 (.16)	.86 (.18)	.89 (.16)
C5 Self-discipline	.60 (.21) .14	.59 (.21) .14	.70 (.22)	.70 (.20)
C6 Deliberation	.70 (.22)	.70 (.21)	.84 (.23)	.80 (.21)

For all models, N = 140. Bold font indicates coefficient significant at $p \leq .05$; underlined coefficient indicates borderline significance ($.05 < p \leq .06$).

Trait coefficients (Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness): association with GTQ when traits are the only personality variables in the model (i.e. no individual facets included).

Facet coefficients: association with GTQ when this facet replaces its parent trait in the model (e.g. the coefficient for N1 [Anxiety] indicates the association between N1 and GTQ when N1 replaces Neuroticism in the model alongside Extraversion, Openness, Agreeableness and Conscientiousness).

Demographic variables included were age, gender and year of education. Year of education tended to significantly predict behavioural trust in most models, as did age. All three variables tended to significantly predict behavioural trustworthiness.

Models predicting behavioural trust also controlled for having played Game 1 as the Sender.

At certain times, the following traits also become significant:

The odds ratio (OR) for Agreeableness reaches significance in the models for twelve facets, for example, Neuroticism's *anxiety*, *angry hostility* and *self-consciousness*. In these twelve models the coefficient for Agreeableness ranges from 1.46 ($p < .05$, $r = .10$) to 1.78 ($p < .01$, $r = .16$), indicating that one's likelihood of investing (as the Sender in the trust game) increases by up to 78% per unit increase in Agreeableness. The variation in this trait's relationship with behavioural trust, across the facet models, illustrates the interrelatedness that exists across the NEO personality constructs.

In previous studies, Müller and Schwieren (2012) reported correlations between behavioural trust and Neuroticism and Agreeableness, and associations for these plus Conscientiousness in a regression model that also accounted for age and gender. Meanwhile, Becker and colleagues (2012) reported that Agreeableness and Conscientiousness significantly correlated with behavioural trust. Clearly this is not unquestioningly supported by my main analyses. T-test analyses of the relationships between behavioural trust and Agreeableness, and behavioural trust and Conscientiousness, also show non-significant associations indicating that there is no relationship even when the other traits are excluded from the models.

These differences may be due in part to differences in the design of the games used. In Müller and Schwieren's (2012) trust game, both the Sender and Returner began the game with the same endowment and were each at liberty to transfer any

amount to their game partner. Becker et al.'s (2012) game also allowed the Sender and Returner to transfer any amount, although it is not clear whether only the Sender or both participants began the game with a monetary stake. These design differences may well have had an impact on the cognitive and affective processes engaged by the Senders and therefore the responses of participants with different personality trait/ facet configurations.

Facets Behavioural trust is predicted by several personality facets: *vulnerability* (Neuroticism. OR = .56, $p < .05$; $r = .16$), *gregariousness* (Extraversion. OR = .52, $p < .001$; $r = .18$), *warmth* (Extraversion. OR = .50, $p < .01$; $r = .19$), *aesthetics* (Openness. OR = 1.78, $p < .01$; $r = .16$), *feelings* (Openness. OR = 1.77, $p < .01$; $r = .16$), *ideas* (Openness. OR = 1.60, $p < .05$; $r = .13$) and *self-discipline* (Conscientiousness. OR = .60, $p < .05$; $r = .14$) are significantly predictive of behavioural trust. These results indicate that the likelihood of investing is significantly reduced per unit increase in *vulnerability* (by 46%), *gregariousness* (48%), *warmth* (50%) or *self-discipline* (40%), and significantly increased per unit increase in *aesthetics* (by 78%), *feelings* (77%) or *ideas* (60%). The effect of *fantasy* (Openness. OR = 1.55, $p = .052$) is borderline significant. Interestingly, no facets within Agreeableness are significantly associated with one's likelihood of investing when playing as the Sender in the trust game.

With the exception of *fantasy* (which is no longer borderline significant), these associations are also found when demographic variables are excluded from the model. In addition to these, however, in a personality-only model *self-consciousness* also shows a significant association with behavioural trust (OR = .61, $p < .05$; $r = .14$).

As far as I am aware, only one other study has investigated the relationships between personality facets and behaviour in the trust game. Müller and Schwieren (2012) found, in a model that included only the thirty personality facets, that behaviour as the Sender is significantly negatively predicted by *anxiety*, *angry hostility* and *depression* (Neuroticism), positively associated with *trust* and *straightforwardness* (Agreeableness) and negatively associated with *order* and *deliberation* (Conscientiousness).

From the theoretical discussion in Section 5.1.2, Müller and Schwieren's (2012) results make sense while mine are slightly less intuitive. The negative association with *vulnerability* (e.g. sensitivity to loss) makes sense, as could the negative effect of *gregariousness* (e.g. sensitivity to reward) and *self-discipline* (e.g. keen to make good decisions and be efficient). However, I would have expected *warmth* to be associated with investing – particularly given that if they do not invest, their game partner leaves with nothing. In addition, it is not immediately apparent why *ideas* and *aesthetics* should be associated with investing, unless this relates to increased cognitive flexibility to see their game partner's predicament.

Examining the items that measure these facets offers some explanation. While the items that measure *gregariousness* clearly target the extent to which the respondent prefers the company of other people, they might not differentiate between sociability and some form of excitement-seeking. For example, alongside items that ask directly about preferences regarding spending time alone versus with

other people are items such as “I’d rather vacation at a popular beach than an isolated cabin in the woods” (McCrae & Costa, 2010: 103). While this does obviously indicate a preference regarding the presence of other people, I can imagine a number of other reasons why one may or may not want to spend their holiday on a crowded beach.

Similarly, the *warmth* facet measures attachment and interaction style with known others and people one meets face-to-face. It is possible that the distinctly impersonal setting of the computer-based trust game does not inspire warm feelings, particularly when the game partner is an anonymous stranger. Two items appear to measure one’s response to strangers – one is “I really like most people I meet” (McCrae & Costa, 2010: 103), while the second could either indicate a genuine warmth towards strangers or simply the individual’s proclivity for looking as though they are having a good time.

And finally, the Openness facets: while *aesthetics* is ostensibly about appreciation of various art forms, the questions appear to measure the extent to which one is moved by the arts. This could be measuring affective responsiveness, for example romanticism, in which case it may make sense that those who score highly on *aesthetics* could be subtly moved by the plight of the Returner. A closer look at the items measuring *ideas* also makes this finding a little less peculiar: measuring the respondent’s interest in what could be broadly termed ‘philosophical and intellectual puzzles’, it is possible that those who score highly on this facet are

motivated to contemplate the best outcome from the game (or do so automatically without effort), i.e. to bring as much money into play as possible.

5.4.3.3 Predicting behavioural trustworthiness

Research question 4 asked which traits and facets are associated with behavioural trustworthiness. The results of the regression models for behavioural trustworthiness are presented in Table 5.7.

Traits Behavioural trustworthiness is predicted only by Agreeableness ($OR = 1.91, p < .01; r = .18$): a unit increase in Agreeableness is associated with almost twice the likelihood of returning £10 to the Sender. This supports *hypothesis 4*. Elsewhere, Openness significantly predicts trustworthiness when Agreeableness is replaced by *trust* ($OR = 1.55, p < .05; r = .12$) or *straightforwardness* ($OR = 1.58, p < .05; r = .13$), indicating that the likelihood of being trustworthy increases by approximately 56% per unit increase in Openness, when either of these facets is accounted for.

Becker et al. (2012) reported that behaviour as the Returner in the trust game was correlated with Agreeableness and Openness, while Müller and Schwieren (2012) found no significant associations for behavioural trustworthiness at the trait level. Again, these differences may be partially due to the design of these games, which undertook different procedures for eliciting responses from the Returner. Becker and colleagues (2012) used the strategy method, asking Returners to specify in

advance how much they would send back to the Sender for all possible investments they could receive. In contrast, Returners in Müller and Schwieren's (2012) study provided their response after learning how much money the Sender had invested with them. In both studies, Returners were allowed to transfer any amount rather than having their choice constrained.

It is likely that the strategy method will have encouraged participants to think through their responses, thus engaging a different level of cognitive processing than the more instinctive response that I was aiming to measure. In addition, it has been noted that the experience of being trusted tends to have an influence on behavioural response – i.e. level of trustworthiness – perhaps via the release of the neurotransmitter oxytocin (Zak et al., 2004). Therefore, Müller and Schwieren's design is likely to have differentially influenced Returner behaviour versus that of my study.

Facets As shown in Table 5.7, when controlling for demographic variables trustworthiness is predicted by the Neuroticism facet *impulsiveness* (OR = .53, $p < .05$; $r = .17$ – although this effect becomes non-significant when demographics are excluded from the model) and by the Extraversion facet *gregariousness* (OR = .68, $p < .05$; $r = .11$ – which also becomes non-significant when the demographic variables are omitted), in addition to four of the Agreeableness facets: *trust* (OR = 1.75, $p < .01$; $r = .15$), *straightforwardness* (OR = 1.63, $p < .05$; $r = .13$), *altruism* (OR = 2.01, $p <$

.01; $r = .19$) and *compliance* ($OR = 1.66$, $p < .01$; $r = .14$).⁵³ These results show that the likelihood of returning £10 to the Sender significantly drops by 32% with every unit increase in *gregariousness*, and is significantly increased by a unit increase in *trust* (a 75% increase in likelihood), *straightforwardness* (63%), *altruism* (100%) and *compliance* (66%). These associations predominantly remain when demographic variables are excluded from the model, although altruism becomes only borderline significant. These associations largely persist when the demographic variables are removed from the model, however, the effects of impulsiveness and gregariousness become non-significant, and that of altruism becomes borderline significant.

These findings show that behaviour as the Returner in the trust game – at least, in this trust game, with this sample – was predominantly motivated by kindness. This fits the qualitative data, with 62% of those who transferred £10 to the Sender citing reasons such as “it was only fair” or “I felt they should be rewarded”.

Müller and Schwierén (2012) found a significant correlation for *competence*, but only when the amount invested by the Sender was above a certain threshold.

The reduced likelihood of returning £10 for those with high *gregariousness* accompanies a reduced likelihood of investing when playing as the Sender; as noted above, the items measuring *gregariousness* may be measuring a preference for extrinsic rewards (particularly amongst the demographic I sampled). It is interesting

⁵³ Excluding those who appeared to misunderstand the rules of the game results in only minor changes to these findings (see Appendix 5D for a comparison of the coefficients from the two samples).

that *tender-mindedness* (Agreeableness) did not show an association with trustworthiness, especially given the altruistic reasons stated by those who were trustworthy. However, the items that measure *tender-mindedness* are related to broader social issues (e.g. attitudes towards people who are homeless). This may therefore not transfer to the lab/ game context.

Table 5.8: Regression coefficients and effect sizes for the significant predictors

	Self-reported trust (N122) B (SE) <i>r</i>	Behavioural trust OR (SE) <i>r</i>	Trustworthiness OR (SE) <i>r</i>
Neuroticism	-.54 (.22) -.25		
Extraversion		.65 (.22) .12	
Openness		2.11 (.23) .20	(occasional)
Agreeableness	.46 (.20) .23	(occasional)	1.91 (.20) .18
Conscientiousness	(occasional)		
N1 Anxiety			
N2 Angry hostility			
N3 Depression	-.73 (.22) -.34		
N4 Self-consciousness			
N5 Impulsiveness	-.52 (.23) -.23		.53 (.27) .17
N6 Vulnerability	-.62 (.21) -.29	.56 (.25) .16	
E1 Warmth		.50 (.24) .19	
E2 Gregariousness		.52 (.20) .18	.68 (.19) .11
E3 Assertiveness			
E4 Activity			
E5 Excitement-seeking			
E6 Positive emotions			
O1 Fantasy			
O2 Aesthetics		1.78 (.19) .16	
O3 Feelings		1.77 (.21) .16	
O4 Actions			
O5 Ideas		1.60 (.21) .13	
O6 Values			
A1 Trust	1.16 (.15) .59		1.75 (.21) .15
A2 Straightforwardness			1.63 (.21) .13
A3 Altruism	.47 (.23) .20		2.01 (.26) .19
A4 Compliance			1.66 (.19) .14
A5 Modesty			
A6 Tender-mindedness			
C1 Competence			
C2 Order	-.30 (.16) -.18		
C3 Dutifulness			
C4 Achievement striving	-.36 (.15) -.22		
C5 Self-discipline		.60 (.21) .14	
C6 Deliberation			

Trait and 'Game1AsSender' coefficients taken from Table 5.4. Facet coefficients taken from Tables 5.5 – 5.7. Bold font indicates coefficient significant at $p < .05$ or lower; underlined borderline significant at $.05 \leq p \leq .06$.

All models control for age, gender and year of study. Models predicting behavioural trust also controlled for having played Game 1 as the Sender.

5.4.4 The drivers of self-reported trust, behavioural trust and trustworthiness

The predictors of self-reported trust clearly differ from those of behavioural trust and trustworthiness. The significant associations for each outcome measure are

given in Table 5.8 and below I summarise my findings regarding the predictors of self-reported versus behavioural trust, self-reported trust versus trustworthiness, and behavioural trust versus trustworthiness.

5.4.4.1 Self-reported and behavioural trust

As discussed in Chapter 3 (Section 3.1.3.3), no reason has really been offered in the theoretical or empirical literature for expecting one's behaviour in the trust game to relate to self-reported generalised trust. While it is conventional to use the trust game as a measure of generalised trust, it is obvious that this offers a very specific context to the trust scenario.

In fact, it is not clear that the Sender in the trust game responds to their predicament as a 'trust' scenario, because this behaviour is not at all correlated to *trust* as measured by the NEO-PI-3. Rather, it is positively associated with trait Openness and the Openness facets *aesthetics*, *feelings* and *ideas*, and negatively associated with the facets *vulnerability*, *gregariousness*, *warmth* and *self-discipline*. Self-reported trust, in contrast, is negatively associated with trait Neuroticism, the Neuroticism facets *depression*, *vulnerability* and *impulsiveness*, and the facets *altruism*, *fantasy*, *achievement-striving* and *order*. The only effect that is common to both self-reported and behavioural trust is the negative effect of *vulnerability*.

These findings strongly suggest that behaviour as the Sender in (this version of) the trust game is not motivated by the same cognitive and affective processes as responses to the generalised trust question (GTQ). The strong relationship between the GTQ and the NEO *trust* facet indicates that the GTQ does indeed measure trust. However, further research is needed to determine what the trust game measures: the results of the current study strongly suggest that the decision is related to the ability to affectively connect with the Returner and a cognitive aptitude for reflecting on the optimal outcome. Research has shown that one's propensity for this type of cognitive processing is diminished by activation of the amygdala's fight/flight response or the perception of threat (e.g. Dimoka, 2010), which may account for the role of *vulnerability* in promoting a decision to keep the £5. However, these results could be largely due to the design of the game used in this study. It would be interesting to test the personality associations with a revised design, such that the Returner also begins the game with £5 (and the multiplication factor of the invested amount is adjusted accordingly).

These results suggest that a decision to return £10 to the Sender – which entails a recognition of the favour the Sender has done for the Returner, and the willingness to accept a lower payoff – is driven by Agreeableness; whatever drives Agreeableness appears to endow its bearer with intrinsic motivation to reciprocate. If we look back to Reward Sensitivity Theory (RST; Section 5.1.2.2), it is perhaps these individuals who gain vicarious enjoyment from rewarding others.

5.4.4.2 Self-reported trust and trustworthiness

As discussed in Chapter 3 (Section 3.1.3.3), there is some reason to expect self-reported trust to be related to behavioural trustworthiness. The personality-based drivers of the two outcome measures offer some support for this, despite the lack of a significant correlation between them.

Four Agreeableness facets are similarly significantly predictive of trustworthiness: *trust*, *straightforwardness*, *altruism* and *compliance*. While *trust* is not the strongest it does have a significant association with trustworthiness, which supports the theories described in Section 5.1.2. These findings also offer partial support for the theories associated with neuroscience

Self-reported trust and behavioural trustworthiness are both significantly influenced by Agreeableness, and in particular by the Agreeableness facet *trust*. However, the effect of Agreeableness on trustworthiness goes farther than it does for self-reported trust, with four of its facets demonstrating a substantial association.

With the Oxford English Dictionary defining ‘trustworthiness’ as “able to be relied on as honest or truthful” (Oxford University Press, 2015), it seems as though Returner behaviour in the trust game may indeed be an indicator of trustworthiness. It is not clear from these results whether we may in fact be observing a preference for cooperation (which has previously been reported as correlating with Agreeableness in public goods games; Volk, Thöni, & Ruigrok, 2011), however, in the role of

Returner, trustworthiness and cooperation are possibly a single preference. As noted in Section 5.4.3.3, the qualitative data indicate a desire to reciprocate the Sender's goodwill rather than a grudging acceptance that it is more socially acceptable to return £10 than to return £0. This indicates that whether we label it 'trustworthiness' or 'cooperation', this behaviour is undeniably driven by volitional reciprocal intentions and a desire to treat the game partner well. Again, this may be due in part to the game design used in this study – the Returner is aware that the Sender could have just kept their £5, so the more Agreeable person may be inclined to view the Sender's investment as a kind gesture and to show their gratitude for the Sender's consideration.

5.5 Conclusions

In this section I summarise my findings with regard to the degree of support indicated for Personality Theory (Delhey & Newton, 2003) and the apparent relatedness of self-reported trust and behaviour as the Sender and Returner in the trust game. I then reflect on what this study has taught me regarding my three outcome measures.

Personality Theory

According to the results of this study, self-reported generalised trust is inhibited by Neuroticism as well as its facets *depression*, *vulnerability* and *impulsiveness*. In the broader sample (N140) and full sample (N170), self-reported trust is also associated with the Extraversion facet *positive emotions* (representing trait optimism). These findings support the theory described in Section 5.1.2.4, which posited that trust should be associated with positive affect (Approach behaviours) and caution with negative affect (Avoidance behaviours). Clearly, these findings demonstrate some support for the Personality Theory of generalised trust.

Relationships between self-reported trust and behaviour in the trust game

As noted above, there is not a great deal of overlap in the personality-based predictors of self-reported trust and behaviour as the Sender in the trust game. I have thus been unable to find empirical or theoretical support for the common assumption that the trust game offers us a behavioural measure of generalised trust. In contrast, a relationship between self-reported trust and behaviour as the Returner does appear more tenable, both theoretically and empirically. Those who score highly on the prosocial personality trait Agreeableness report a higher level of generalised trust and they are more likely to return a positive amount to the Sender when playing as the Returner. Qualitative data suggest that the latter inclination is

driven by a desire to show kindness to their game partner rather than any assumption that other people would do the same for them.

5.5.1 Lessons, limitations and recommendations for future research

I now turn to reflect on what I have learned from this study regarding my three outcome measures; self-reported trust and behaviour as the Sender and Returner in the trust game.

The generalised trust question

With the GTQ having received much criticism in the literature (regarding its lack of specificity, its bipolar response scale and the fact that it is only one item), it is interesting to note that it stands up rather well to comparison with the six-item NEO *trust* facet: part of an inventory that has for some time been regarded as the gold standard in personality assessment (University of Cambridge, 2015). It is also interesting to note that there are no grounds on which we should expect the GTQ to correlate with behaviour as the Sender in the trust game (see Naef & Schupp's [2009] concerns regarding what the GTQ measures).

Given that my questionnaire did also measure the other two items from the three-item social trust scale, in future research I could re-run these analyses using these

two items, and the mean score on the social trust scale, as outcome measures in place of the GTQ. This would enable me to compare their personality-based predictors and investigate the extent to which they appear to measure generalised trust.

The trust game: Sender behaviour

There are a number of unexpected but ultimately informative observations to be made from this study regarding the decision made by the Sender: the possibility that the decision to invest was driven by altruism rather than by trust; the possibility that this game design in fact measures caution (which, if comparable to the generalised trust question, may not be the opposite end of a bipolar scale with trust and therefore may be associated with different predictor variables); and, that the initial stake may have been too low to stimulate a trust-based decision.

Trust versus altruism or cooperation As noted above, the likelihood of participants investing their £5 stake was not associated with the Agreeableness facet *trust*. In addition, the only overlap between the predictors of self-reported and behavioural trust was that both were negatively associated with the Neuroticism facet *vulnerability*. Adding this to the qualitative data, which shows that the majority of those who invested were motivated by other-regarding concerns, it appears that in this experiment the decision to invest was not usually a trust decision. This may largely be due to the Returner starting the game with £0, as discussed above,

perhaps prompting the Sender to be either cooperative or altruistic. The design used was developed intentionally in order to polarise participants, in particular, to make the decisions for Sender and Returner difficult so there would be a good chance that the decisions would be made for a reason rather than arbitrarily. It would be helpful if future work could test a similar design, but where both the Sender and Returner start the game with £5 (and the multiplication factor applied to the invested amount adjusted accordingly). It would be interesting to test which personality elements predict Sender behaviour under these conditions; in theory the decision to invest should not be driven by altruism because both begin the game with the same amount.

Measuring trust versus distrust For those who chose to keep their £5, the qualitative data indicate that this was very much about not trusting that their game partner would return any money to them. It is therefore possible that what this game actually measured was distrust. These results may be illustrative of Dimoka's (2010) findings, from neurological investigations, that trust is associated with the reward region while distrust is associated with the emotional and negative affect region (at least in part, the amygdala). Dimoka also flags that (a) emotional processing occurs before cognitive processing, and (b) activation of the amygdala, which is the home of the fight/ flight reflex, tends to be immediate and decisive. With Neuroticism associated with negative affect, and those with high Neuroticism more prone to amygdala activation, it is natural that high Neuroticism would be associated with a decision to keep the £5. With this in mind, my findings offer only partial support to Holm and Nystedt's (2008: 536) assertion that "... if the issue of trust is addressed in

non-hypothetical settings, subjects appear to be driven by other motives that are more related to concepts such as kindness and fairness”; it is for those who invest, but according to the qualitative data for many of those who were cautious distrust was very much a driving factor in their decision to keep the £5.

Value of the initial stake From a study that elicited participants’ expectations of their game partner’s trustworthiness, Sapienza et al. (2013) note that the Sender’s behaviour is not driven by trust for small amounts of money. The initial stake held by the Sender was constrained by my budget for this experiment, however, it is possible that £5 is too low an amount to warrant a decision based on trust (even for students, who are notoriously poor). For those adept at self-regulation (high Agreeableness; Jensen-Campbell et al., 2002), the primary concern was to make the game fair for their game partner, while for those without this facility at their disposal (or for whom financial hardship was a more pressing issue), concern about their own potential losses won out and they kept the money. It would be interesting to test whether the personality predictors of Sender behaviour varied if the initial stake were raised to £10 or £15.

And finally, a note regarding the comparability of the generalised trust question and behaviour as the Sender: Holm and Nystedt (2008) report that while they found no correlation between self-reported trust and behaviour as the Sender in the trust game when there was a monetary incentive, self-reported and behavioural trust did correlate when there was no incentive. Therefore, it may be the case that the trust game measures generalised trust, but only when the scenario – much like the

generalised trust question – is free of consequence. This suggests that self-reported trust cannot necessarily be regarded as an indication of one's actual likely behaviour given a scenario that requires trust, but should perhaps be regarded as an indication of the person's outlook. Given that the incentivised trust game is inherently not free of consequence, this cannot be assumed to measure generalised trust. This may give cause to question Naef and Schupp's (2009b) efforts to develop a survey measure of trust that correlates with behaviour in the trust game, and what their new item actually measures.

Ideally, future work should examine the predictors of decisions in an incentivised, and a non-incentivised, trust game. In addition, it would be helpful if the questionnaire also included Naef and Schupp's (2009b) new measure of self-reported trust, so that its predictors can be compared with those of the standard generalised trust question as well as behaviour in both the incentivised and non-incentivised game.

It may also be informative to experiment with a range of starting endowments and patterns of endowment – i.e. whether just the Sender begins the game with a monetary stake or both the Sender and Returner do so. Investigation of the predictors of Sender behaviour in each design may help us to establish exactly when, if ever, Sender behaviour is driven by trust.

The trust game: Returner behaviour

Returning £10 to the Sender was associated with a higher level of Agreeableness. This is to be expected, given that those higher in Agreeableness tend to be more compassionate and inclined to choose other-regarding behaviour over self-interest (van den Bos, van Dijk, Westenberg, Rombouts, & Crone, 2009). In addition, the significant coefficient for the *trust* facet may support Evans and Revelle's (2008) suggestion that those who are trusting are more likely to see the Sender 'as a partner rather than as an opponent' (p.1592). My participant information sheet did specifically refer to 'game partner' rather than 'opponent', so it is possible that this was noted by those whose prosocial inclinations outweighed any concerns about their own vulnerability to potential losses.

As discussed in Section 5.4.1.5, it appears as though a fair proportion of my participants (21% of 140 people) misunderstood the rules of the trust game. While I made every effort to explain this clearly, it appears that some had mistaken it for a prisoner's dilemma game and assumed that their decision as the Returner somehow had to match the Sender's decision. I am not aware of another study that has asked participants why they made the decisions they did, so it is not currently known how often this or a similar misunderstanding occurs. It would therefore be advisable for future studies to include a measure of participants' rationale behind their decisions. Studies should also make it very clear in the instructions that the only consideration for the Sender and Returner is how much money they would like to transfer.

Miscellaneous improvements to the study design

At the start of the trust game session – after I had read out the participant information sheet and before Game 1 began – zTree. asked the participants four questions, ostensibly to check they had understood the rules of the game but also to make them aware of the rules if they had been otherwise engaged up until that point. As should undoubtedly be expected, some participants had difficulty answering these questions, especially Question 4 which asked them how much the Sender may receive in return if they invest their £5 (£0 or £10).

It may have helped their understanding if I had included in the instruction sheet a decision tree to illustrate each possible monetary outcome. I had elected not to include this due to a concern that it might encourage participants to ignore the text, however, it appears some did this anyway. Therefore, including such a diagram might ensure that those who do not read the text can at least become aware of the rules with little effort.

And finally, it is not clear whether my measure of betrayal aversion worked. It would be very useful to conduct cognitive interviewing on this measure to find out how participants interpret and respond to the question. It could also be informative to undertake a similar exercise regarding decisions in the trust game – and preferably for different designs of the game.

5.5.2 Overall conclusions

Within a rather homogenous sample of a relatively homogenous population, I have found that self-reported generalised trust (as measured using the GTQ) is related to personality (as measured by McCrae and Costa's [2010] NEO-PI-3), as are the decisions made by the Sender and Returner in (this version of) the trust game. Additionally, I have found evidence that the GTQ does measure self-reported trust, and it appears that behaviour as the Returner in (this version of) the trust game can be taken as an indicator of trustworthiness.

Behaviour as the Sender has been slightly more difficult to pigeonhole and does require closer investigation as described above. However, initial indications suggest that it should not be used as an indicator of generalised trust equivalent to a behavioural measure of the GTQ. Importantly, the evidence so far suggests that neither should the non-correspondence between these two measures be taken as an indication of weakness on the part of the generalised trust question.

The individual-level drivers of generalised trust are not likely to inspire policy change or widespread social reform. They can, however, help us to understand the origins of generalised trust rather than just its moderators. While the social and societal theories regarding the aetiology of generalised trust do have important points to make regarding environmental influences on our perceptions and behaviour they cannot truthfully be cited as describing its origins. The evidence base for the

individual-level theories is building and, especially with contributions from the fields of social and personality neuroscience, it will be interesting to see how far we can go towards uncovering the processes that underlie trust and its associated behaviours.

Chapter 6

Conclusions

6.1 Introduction

I began this thesis by discussing the importance of social cohesion and social capital – in particular, bridging social capital – and the value of subjective measures. As noted in Chapter 1, a new use of these indicators emerged several years ago with Harrison et al.'s (2011) proposed set of indicators of the perceived progress of society, which measure perceptions of Lockwood's (1964) social integration (the degree of cohesion versus discord between individuals within society) and system integration (the degree of cohesion versus discord between the parts that maintain the functioning of society, such as its institutions).

In this chapter I briefly describe the aims of my earlier chapters and their findings. I then discuss some of the potential implications of my findings from chapters 4 and 5 and, finally, in my overall conclusions I briefly re-examine some of the explanations noted in Chapter 3 regarding the apparent decline in generalised trust (and thus social cohesion) over the past several decades.

6.2 Chapters 2 to 5

Chapter 2 investigated the degree of measurement invariance across time demonstrated by four of Harrison et al.'s (2011) proposed indicators of the progress of society: Social Trust, Trust in Institutions (represented here as two constructs: Political Trust and Trust in the Law), Evaluations of National Performance and the (perceived) Quality of Public Services. I found that events such as the financial crisis can have a detrimental impact on the integrity of theoretical constructs, as respondents' evaluations on a single aspect cease to be driven by heuristics and instead reflect the objective state of affairs. With data collected both before and during the financial crisis, the Evaluations of National Performance domain failed to achieve full scalar equivalence. It was necessary to draw out *satisfaction with the economy* as a standalone factor before this model could show equivalence across time.

To my knowledge, this is the first empirical investigation into the measurement invariance of these indicators over time and, perhaps fortuitously, the years spanned permitted realisation of the potential objectivity of these measures. While perhaps predominantly of interest to those involved in the design of surveys and the development of social indicators, similar research involving data from subsequent years could be informative regarding the extent of public response to the financial crisis and whether it has also damaged public opinion regarding the performance of the government or the functioning of democracy, perhaps permitting the re-grouping of this theorised factor via the modification of existing heuristics.

In Chapter 3, I investigated the existing theoretical and empirical literature relating to the individual-level and society-level theories of the origins of generalised trust. At the individual level, these are Personality Theory (Delhey and Newton, 2003) and Uslaner's (2002) theory of the moral foundations of trust (MFTT), while Societal Theory bears similarities to Rothstein and Stolle's (2008) Institutional Theory. In my review of the literature, I found that there was a dearth of empirical examinations of theories at both of these levels in comparison to the vast literature that has examined the theories that posit the social origins of generalised trust. Particularly troubling was that Personality Theory had in one study been tested using inappropriate proxy measures (that in fact are more likely to be indicators of social-level theories), from which the authors concluded that personality was not relevant to social trust (Delhey & Newton, 2003). I closed this chapter with the recommendation that further research should be undertaken to test the individual-level theories.

In chapters 4 and 5 I followed up on this recommendation by implementing theoretically-driven tests of the two individual-level theories of generalised trust. In Chapter 4 I investigated the relationship between generalised trust and Schwartz's human values. In addition, I examined the extent to which these relationships vary cross-nationally – i.e. in different societal contexts (according to the level of corruption and income inequality in society). I found that Schwartz's Self-transcendence (combined Universalism and Benevolence) and Security values (and perhaps the combined Conformity/ Tradition value, depending on one's view

regarding the appropriateness of including demographic variables in the model) do indeed predict generalised trust, thereby supporting Uslaner's (2002) theory of the moral foundations of trust.

The Level 2 variables – national levels of corruption and income inequality – also predict self-reported trust, with lower corruption and income inequality associated with higher reported levels of trust. In testing the stability of the effects of the human values (on generalised trust), I found that each of the values constructs generally demonstrates a stable relationship with generalised trust cross-nationally (although there was a marginal effect for Conformity/ Tradition, which reported a borderline significant coefficient in random slopes analysis). This suggests that, on average, human values are affected by the characteristics of society in a manner similar to generalised trust.

In Chapter 5 I tested Personality theory, which posits that generalised trust is driven by and is indeed an aspect of personality. Given the on-going debate in the literature regarding whether the generalised trust question measures trust or trustworthiness, I investigated not only the extent to which personality predicts self-reported generalised trust, but also behaviour as the Sender and Returner in the trust game (which are commonly used as behavioural measures of trust and trustworthiness respectively).

I discovered that self-reported trust is predicted by personality, as are the two behaviours measured in the trust game. However, in this design of the game, self-

reported and behavioural trust share no personality-based predictors except that both demonstrate a negative relationship with the *vulnerability* facet of Neuroticism. While self-reported trust is strongly related to the *trust* facet of Agreeableness, in this study this facet shows no relationship at all to behaviour as the Sender. It is therefore not yet clear that the trust game measures trust, or that the GTQ should be expected to correlate with this behaviour. From participants' responses to the qualitative items, it appears that in this game design investing as the Sender is driven primarily by concern for the game partner, while declining to invest is associated with distrust or caution.

It appears likely, however, that this game design did measure trustworthiness since this behaviour was positively associated with Agreeableness. Agreeableness is likely to imbue the Returner with a drive to be fair to their game partner rather than to prioritise self-interest. With self-reported trust also showing an association with this trait, it is possible that both the GTQ and trustworthiness are driven by prosocial inclinations. Naturally, I interpreted these results with consideration to the design of the game.

6.3 Who trusts and why?

At the beginning of Chapter 4, I flagged the rhetorical question of who trusts and why. As one may intuitively expect, it appears as though those who prioritise egalitarian values are more likely to report a higher level of generalised trust.

Generalised trusters tend to report low Neuroticism and high Agreeableness. In some models trust is positively associated with trait Extraversion and positive emotions (dispositional optimism). Generalised trusters score low on the Conscientiousness facets *order* and *achievement striving*. Feelings of vulnerability and concern for Security are associated with lower levels of trust, as are (amongst others) high scores on the Neuroticism facets *impulsiveness* and *depression* and the prioritisation of values that indicate concern for the standing of one's own social group.

Generalised trust is also more likely to be reported by those who live in more progressive societies, where corruption and income inequality are low.⁵⁴ These findings therefore indicate support for the Societal Theory of generalised trust; that one's evaluation of the trustworthiness of others is in part associated with the nature of the society in which one lives.

The relationships between personality traits and trust make sense according to the neuroscientific literature, where high Agreeableness has been found to be positively associated with so-called 'effortful control' – the automatic inhibition of a dominant response⁵⁵ in favour of a preferred (but subdominant) response (Jensen-Campbell et al., 2002) – while high Neuroticism is associated with a lower level of cognitive control over the dominant response (Augustine, Larsen, & Lee, 2013).

⁵⁴ Given their extremely strong correlation with corruption, this effect would also be observed for societies with higher GDP per capita and with higher government efficacy.

⁵⁵ A dominant response may be, for example, for the Returner to keep the £15 because this is in their own favour. A subdominant response may be to transfer £10 to the Sender, keeping only £5 for oneself, in order to reciprocate the favour (had the Sender not invested their £5, the Returner would have ended the game with £0).

Essentially – and, as may intuitively be expected – generalised trusters trust because they are not sufficiently concerned to be distrustful. Conversely, particularised trusters are cautious because they are prone to feelings of vulnerability. However, there is a caveat. It is not clear whether the Agreeable individual really *wants* to report that they think most people can be trusted (or that they really *want* to return £10 to their game partner and keep only £5 for themselves). We are simply measuring the response they decided to give. This is not to imply that they responded disingenuously; rather, that while the Agreeable person probably will give strangers the benefit of the doubt (and probably will behave in a trustworthy manner), this may not have been their immediate affective reaction when first faced with the question. While those who are low in Agreeableness are less likely to be able to self-regulate any negative emotional response and therefore may report their first response, the Agreeable person's 'effortful control' system will enable them to quickly select their response to most situations.

6.4 Implications of my findings for research into generalised trust, and the importance of individual-level characteristics

In this section I discuss the possible implications of my findings for the individual-level theories of generalised trust and for broader research in this field. I also discuss the potential benefits of considering individual-level characteristics (such as personality) in social research.

The individual-level theories of generalised trust

The results of chapters 4 and 5 clearly offer encouragement for both Uslaner's (2002) theory of the moral foundation of trust and Personality Theory (Delhey & Newton, 2003). However, it is not clear whether each model independently accounts for a substantial proportion of the variance in generalised trust or if they simply overlay each other. This is not a question I can answer from the results discussed here, but examination of this in future research would be of value.

In the event that the effects of personality and values are found to be driven by the same underlying mechanism, careful consideration would need to be given to whether these can really be regarded as two separate theories and, if not, whether the continuance of both theories serves to blur our understanding of trust or if they are complementary. These theories may or may not both be crucial to our understanding of generalised trust, but they may both be important to elucidating the social manifestations of our personality and value orientations.

Broader research into generalised trust

As discussed earlier, previous research has primarily focussed on the social drivers of generalised trust. My findings indicate that generalised trust is associated with

individual-level characteristics. Our personality and values are key in driving our perceptions, feelings and behaviour; these characteristics will therefore contribute to the nature of our engagement with our social environment. It would be interesting to examine the degree of variance in self-reported generalised trust that is 'explained' by the socially-oriented theories once the effects of personality are accounted for.

The second key finding from this research is that this study does not support the use of the trust game as a behavioural measure of generalised trust. While further research is needed, using different samples and different designs of the trust game, there is as yet no theoretical or empirical justification for expecting self-reported trust and behaviour in the trust game to correlate. While there do appear to be theoretical and empirical reasons to expect self-reported generalised trust to correlate with behavioural trustworthiness, the results of my study suggest this may not be for the reason most commonly cited in the literature: while many suggest that a correlation between these measures is likely to be due to an assumption that others are like ourselves, my findings support Evans and Revelle's (2008) suggestion that in fact those who are more prosocial and cooperative are more likely both to trust and to be trustworthy (and, in the context of the trust game, they are perhaps more likely to regard their Sender as a game partner than as a competitor).

These findings, if replicated by future studies, suggest the need for a change to the way the generalised trust question, and generalised trust as a concept, are regarded in the literature.

Regarding the relevance of individual-level characteristics to social research

The individual-level theories of generalised trust, particularly alongside insights from the fields of social and personality neuroscience, offer immense opportunities for developing our understanding of the relationships between our perceptions, our behaviour and our neural functioning. By considering these related fields of research, similar opportunities may be realised by those concerned with other cognitions or behaviours. While social factors (for example, our occupation or socio-economic status) and societal factors (for example, the degree of government effectiveness and corruption) do undoubtedly have a role to play in driving the way in which we interact with our environment (and the people and institutions in it), consideration of the individual's temperament or predispositions could be exceptionally informative if appropriate attention is given to the development of theoretical orientations.

While I appreciate that fielding a very long questionnaire requires a time luxury (and perhaps a budgetary luxury) that large-scale social surveys generally do not have, the periodic inclusion of a similar personality inventory in a longitudinal, representative population survey could be immensely helpful to researchers across the life sciences, in particular, psychological and health sciences. It would further our understanding of not only changes over time but also (if fielded alongside appropriate partner questions) how to encourage changes in attitudes and

behaviour. Other fields that may draw particular benefit from the availability of such data include the political sciences, family and gender studies and perhaps economics.

6.5 Overall conclusions

The initial and underlying concern of this thesis was with the measurement of social and system integration, and the importance of both of these to a high-functioning society. Much emphasis has been placed on generalised trust as an indicator of social cohesion and of the 'wellness' of society, and the apparent decline of generalised trust over time has been seen by many as a cause for concern.

The increasing diversity within UK towns and cities may prompt stronger concerns for those who have a more restricted moral community; the clearer presence within society of people who they perceive to be substantially different to themselves (due for example to differences in appearance or in cultural practices) may raise concerns about the security and standing of their own social group. Meanwhile, as the pace of life (and associated pressures) increase, increasing levels of stress may be putting everybody at heightened risk of negative affective states (such as depression) which, in turn, are associated with increased feelings of vulnerability and a lower likelihood of reporting that most people can be trusted.⁵⁶ While the authorities report interest in boosting bridging social capital, these efforts may need to be supplemented with

⁵⁶ It goes without saying that the higher prevalence of negative affect that is likely in low quality societies is likely to raise the proportion of the population that report caution over trust.

interventions that seek specifically to alleviate the concerns of those who are low in generalised trust and whose primary concern is for the wellbeing of the existing community and society.

APPENDICES

2A Table 2A: Fieldwork dates, sample size and response rates	360
2B Table 2B: Descriptive statistics	361
2C.1 Figure 2C.1: CFA model for ESS3	362
2C.2 Figure 2C.2: CFA model for ESS4	363
2C.3 Figure 2C.3: CFA model for ESS5	364
2D.1 Figure 2D.1: MGCFA coefficients for ESS3	365
2D.2 Figure 2D.2: MGCFA coefficients for ESS4	366
2D.3 Figure 2D.3: MGCFA coefficients for ESS5	367
3A.1 Figure 3A.1: Trajectories of the social trust items over time (Yamagishi et al., 1999)	368
3A.2 Figure 3A.2: Trajectories of the social trust items over time (Rahn and Transue, 1998)	369
3B Figure 3B: Costa and McCrae's (1996) five-factor personality system	370
4A.1 Table 4A.1: Descriptive data: age, gender and education	371
4A.2 Table 4A.2: Descriptive data: occupation, financial comfort and generalised trust	372
4A.3 Table 4A.3: Descriptive data: Schwartz's (2001) human values	373
4A.4 Table 4A.4: Descriptive data: Level 2 variables	374
4B Table 4B: Correlation matrix	375
5A Questionnaire content	376
5B.1 Session 1 consent form	383
5B.2 Session 1 participant information sheet	384
5B.3 Session 2 consent form	385
5B.4 Session 2 participant information sheet	386
5C Table 5C: Correlation matrix	387
5D Table 5D: Regression coefficients for self-reported trust (N = 170)	395
5E Table 5E: Regression coefficients for trustworthiness (N = 112)	396
5F Table 5F: Regression coefficients (controlling for financial insecurity)	397

Appendix 2A

Table 2A: Fieldwork dates, sample size and response rate for Rounds 2 – 5 of the ESS

	Fieldwork dates	Total sample	Response rate (%)
Target:	01/09/-- – 31/12/--		70.0
ESS2	27/09/04 – 16/03/05	1,897	50.6
ESS3	05/09/06 – 14/01/07	2,394	54.6
ESS4	01/09/08 – 19/01/09	2,352	55.8
ESS5	31/08/10 – 28/02/11	2,422	56.3

Data source: www.europeansocialsurvey.org

Appendix 2B

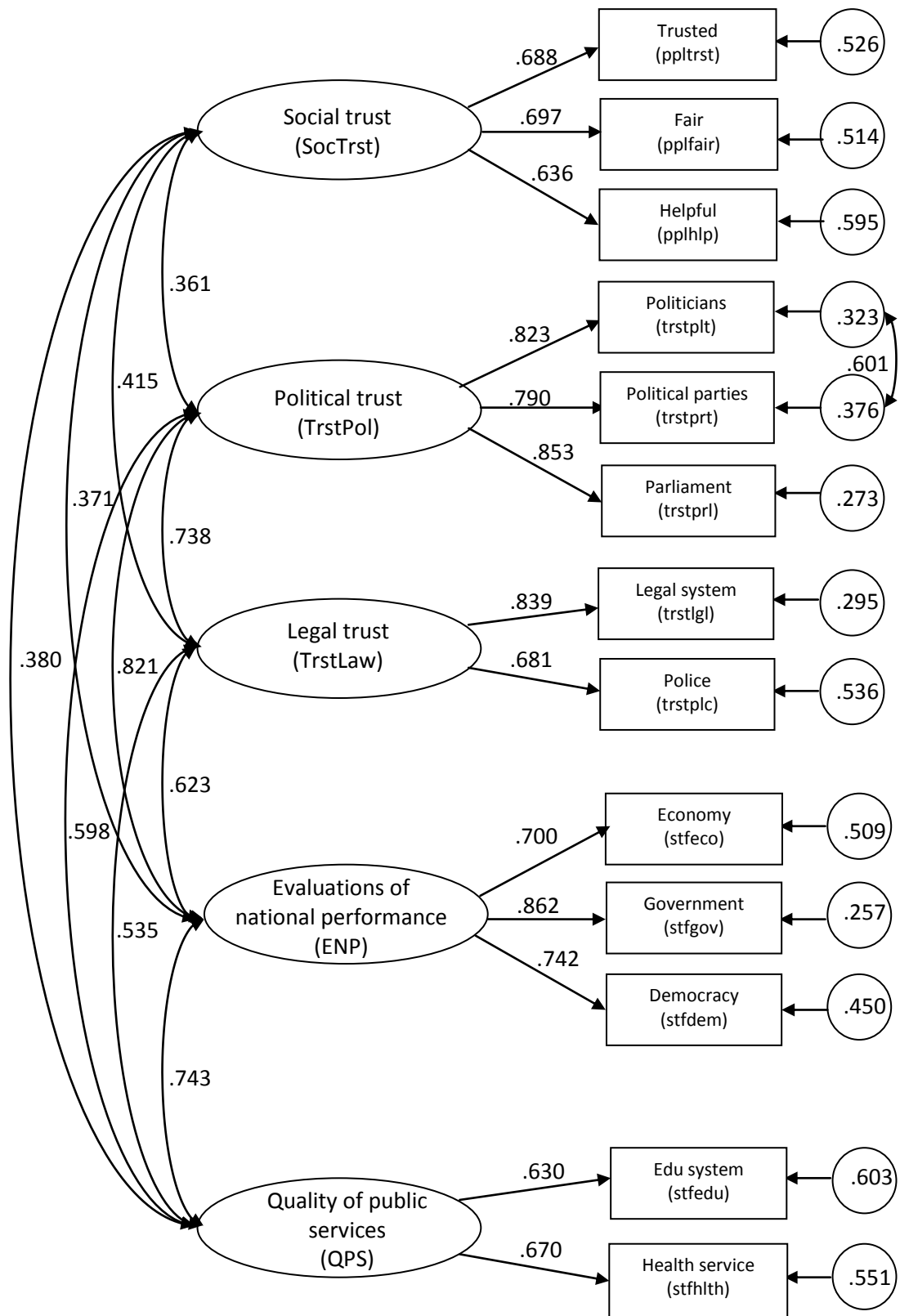
Table 2B: Descriptive statistics (weighted by design weight; sample size and % missing data unweighted)

	Trust in...			Trust in...		People...			Satisfaction with...		Satisfaction with...		
	Politicians	Political parties	Parliament	Legal system	Police	Can be trusted	Try to be helpful	Try to be fair	Edu. system	Health services	Econ.	Gov.	Democ.
ESS2													
Mean	3.59	3.68	4.29	5.12	6.12	5.18	5.64	5.59	5.56	5.40	5.34	4.37	5.14
SD	2.24	2.12	2.34	2.33	2.31	2.14	1.98	2.00	2.06	2.28	2.07	2.27	2.33
Skewness	.228	.099	.014	-.284	-.595	-.325	-.344	-.306	-.340	-.185	-.385	.010	-.228
Kurtosis	-.436	-.508	-.554	-.514	-.112	-.189	-.082	-.128	-.287	-.492	-.253	-.527	-.471
N	1870	1860	1874	1857	1890	1893	1888	1883	1835	1881	1832	1865	1810
% Missing	1.4	2.0	1.2	2.1	0.4	0.2	0.5	0.7	3.3	0.8	3.4	1.7	4.6
ESS3													
Mean	3.41	3.53	4.20	5.00	6.00	5.37	5.68	5.76	5.56	5.23	5.22	4.05	4.93
SD	2.17	2.08	2.34	2.36	2.34	2.13	2.00	2.01	2.12	2.33	2.14	2.31	2.32
Skewness	.092	.027	-.048	-.304	-.598	-.432	-.348	-.504	-.452	-.192	-.406	-.021	-.204
Kurtosis	-.698	-.532	-.568	-.558	-.119	-.036	-.039	.168	-.151	-.541	-.154	-.607	-.391
N	2348	2340	2349	2352	2380	2384	2385	2384	2307	2381	2309	2353	2353
% Missing	1.9	2.3	1.9	1.8	0.6	0.4	0.4	0.4	3.6	0.5	3.6	1.7	5.2
ESS4													
Mean	3.56	3.63	4.32	5.17	6.24	5.29	5.58	5.69	5.75	5.95	3.13	3.60	4.88
SD	2.23	2.16	2.46	2.43	2.40	2.18	2.03	2.08	2.10	2.21	2.11	2.32	2.43
Skewness	.099	.034	-.063	-.298	-.703	-.443	-.349	-.462	-.469	-.468	.419	.249	-.158
Kurtosis	-.525	-.500	-.662	-.542	.045	-.185	-.102	-.060	-.034	-.187	-.165	-.545	-.606
N	2325	2312	2318	2315	2344	2348	2347	2341	2278	2343	2318	2325	2258
% Missing	1.1	1.7	1.4	1.6	0.3	0.2	0.2	0.5	3.1	0.4	1.4	1.1	4.0
ESS5													
Mean	3.43	3.52	4.11	5.24	6.24	5.35	5.75	5.60	5.77	6.29	3.49	4.29	4.97
SD	2.26	2.22	2.41	2.39	2.35	2.13	1.91	2.02	2.08	2.14	2.03	2.34	2.40
Skewness	.152	.064	.001	-.340	-.732	-.471	-.385	-.381	-.503	-.608	.300	-.107	-.221
Kurtosis	-.749	-.756	-.745	-.477	.111	-.227	-.020	-.135	-.167	-.024	-.186	-.697	-.570
N	2365	2350	2344	2333	2395	2415	2405	2396	2273	2394	2359	2299	2237
% Missing	2.4	3.0	3.2	3.7	1.1	0.3	0.7	1.1	6.2	1.2	2.6	5.1	7.6

Data source: European Social Survey Rounds 2 – 5 (2004 – 2010)

Appendix 2C.1

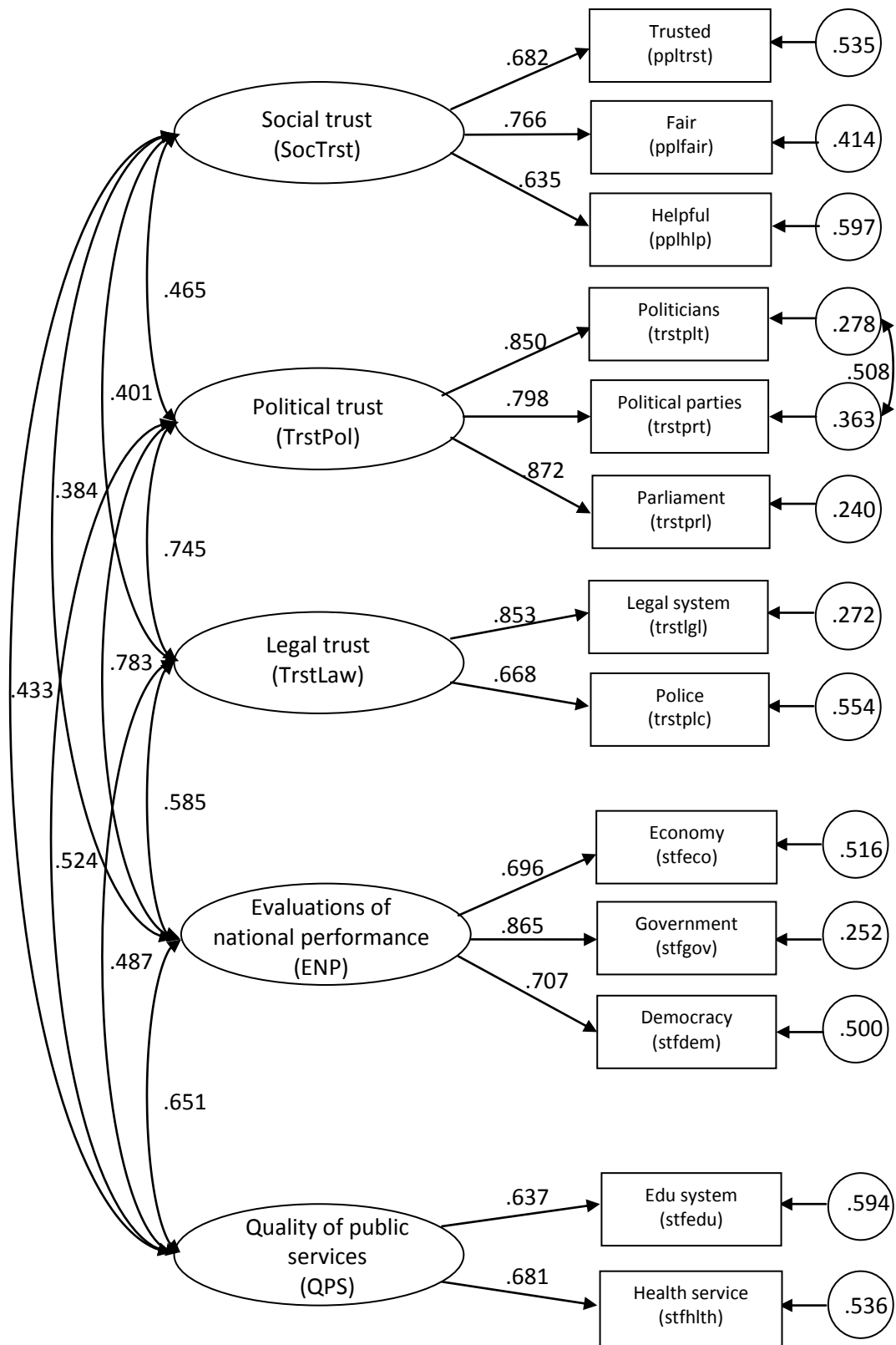
Figure 2C.1: CFA measurement model for ESS3



Data source: European Social Survey (Round 3, 2006)

Appendix 2C.2

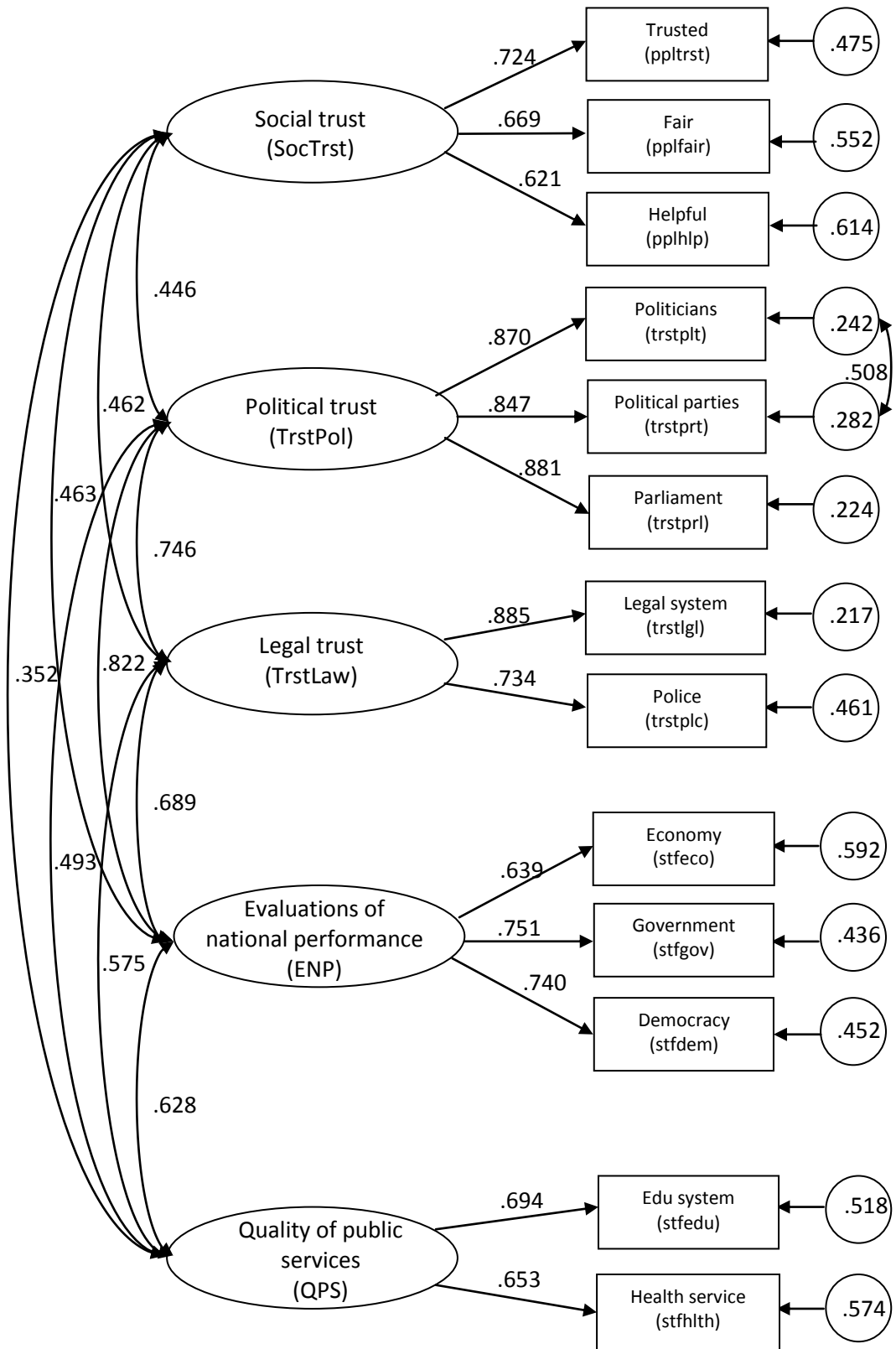
Figure 2C.2: CFA measurement model for ESS4



Data source: European Social Survey (Round 4, 2008)

Appendix 2C.3

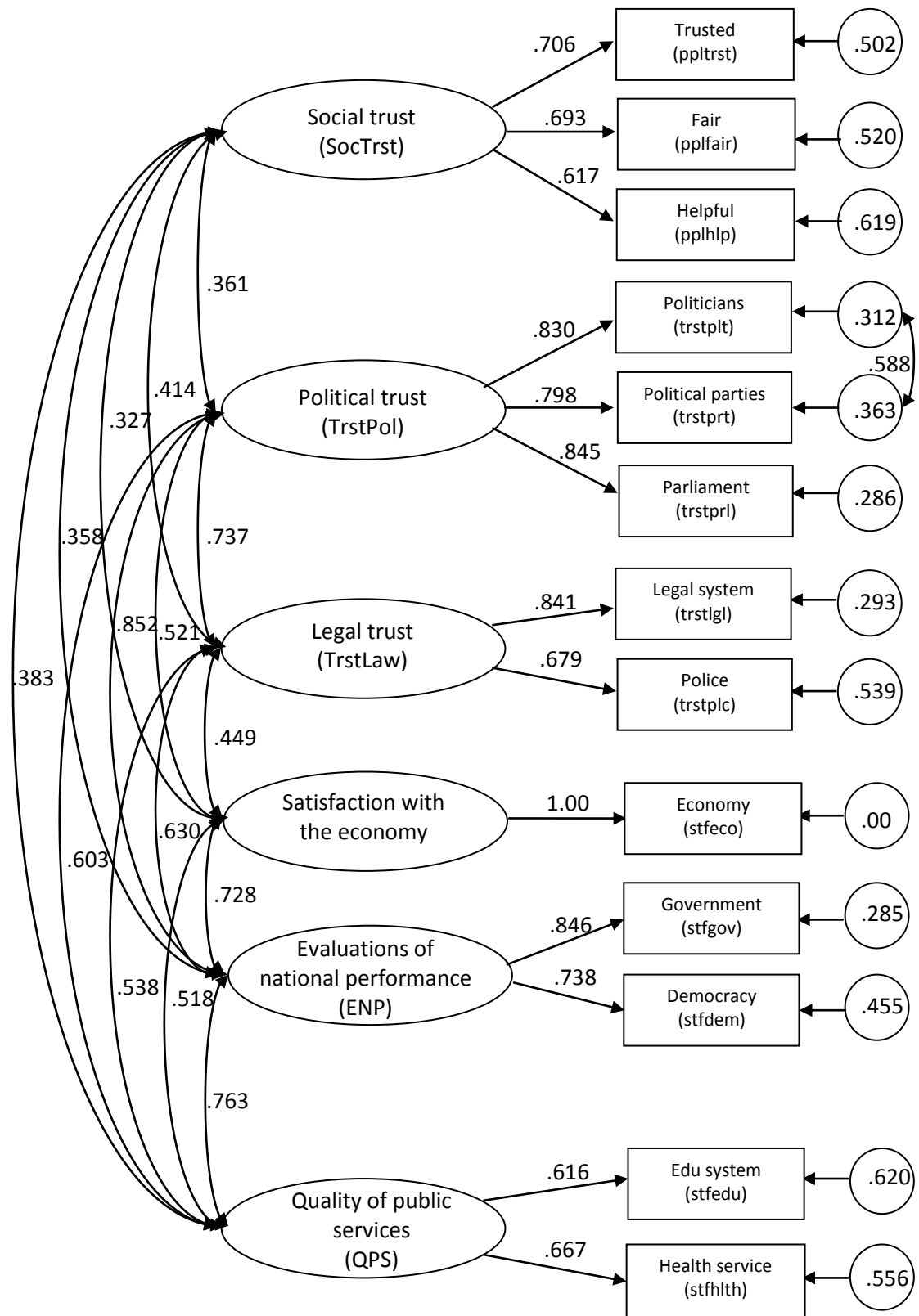
Figure 2C.3: CFA measurement model for ESS5



Data source: European Social Survey (Round 5, 2010)

Appendix 2D.1

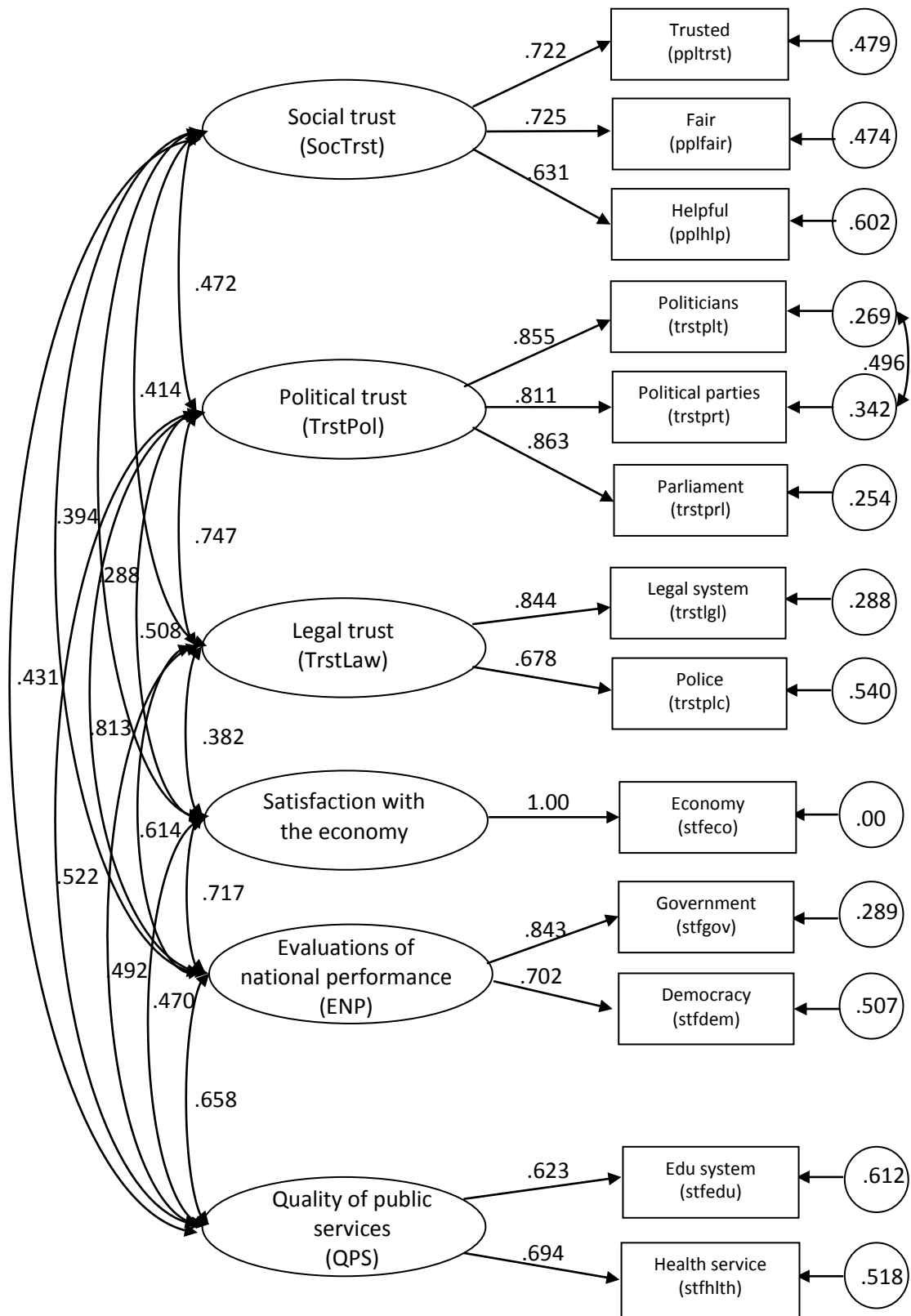
Figure 2D.1: MGCFA Model D coefficients for ESS3



Data source: European Social Survey (Round 3, 2006)

Appendix 2D.2

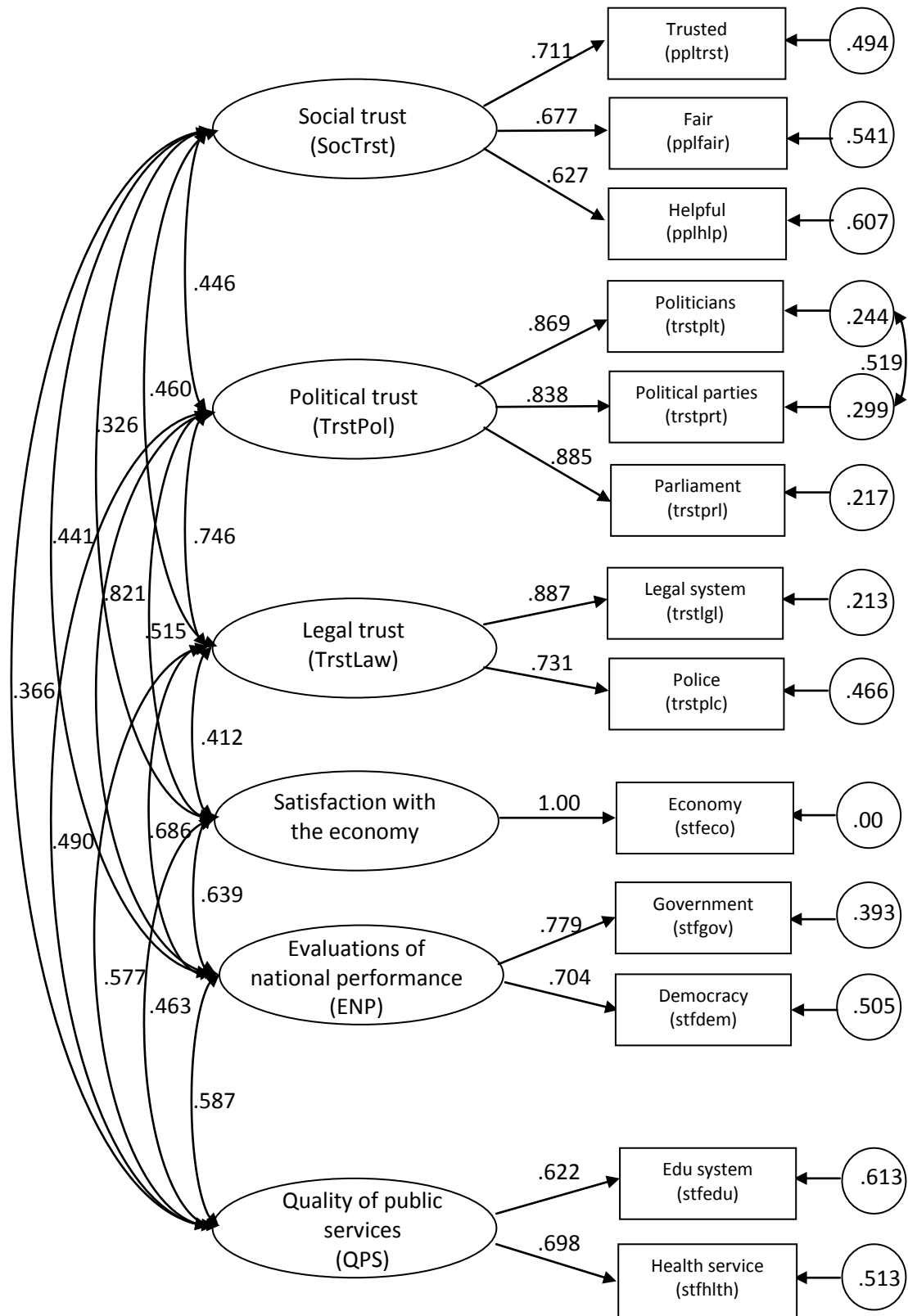
Figure 2D.2: MGCFA Model D coefficients for ESS4



Data source: European Social Survey (Round 4, 2008)

Appendix 2D.3

Figure 2D.3: MGCFA Model D coefficients for ESS5



Data source: European Social Survey (Round 5, 2010)

Appendix 3A.1

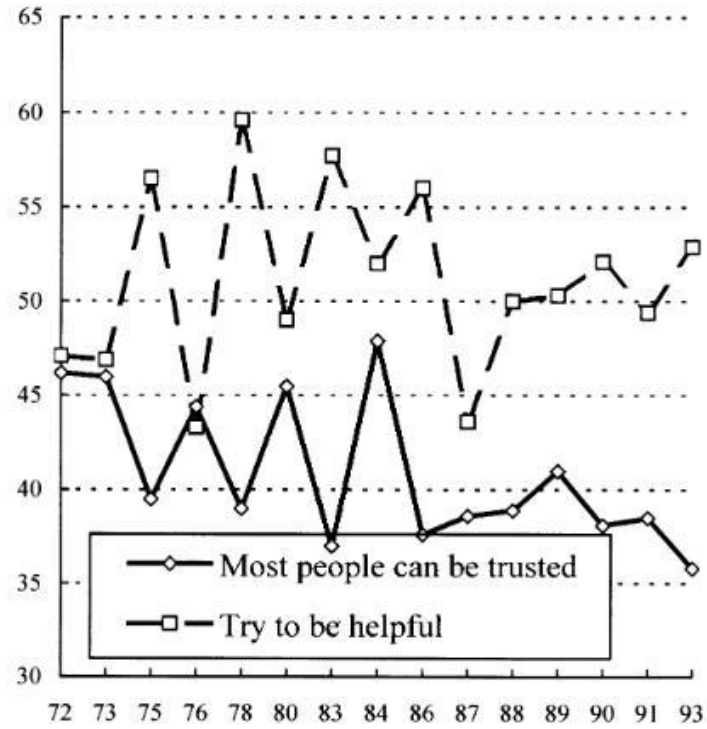


Figure 3A.1: Yamagishi et al.'s (1999: 147, Figure 1) graphical representation of two items from the social trust scale. Reproduced with permission from John Wiley & Sons. Copyright © Blackwell Publishers Ltd with the Asian Association of Social Psychology and the Japanese Group Dynamics Association 1999.

Appendix 3A.2

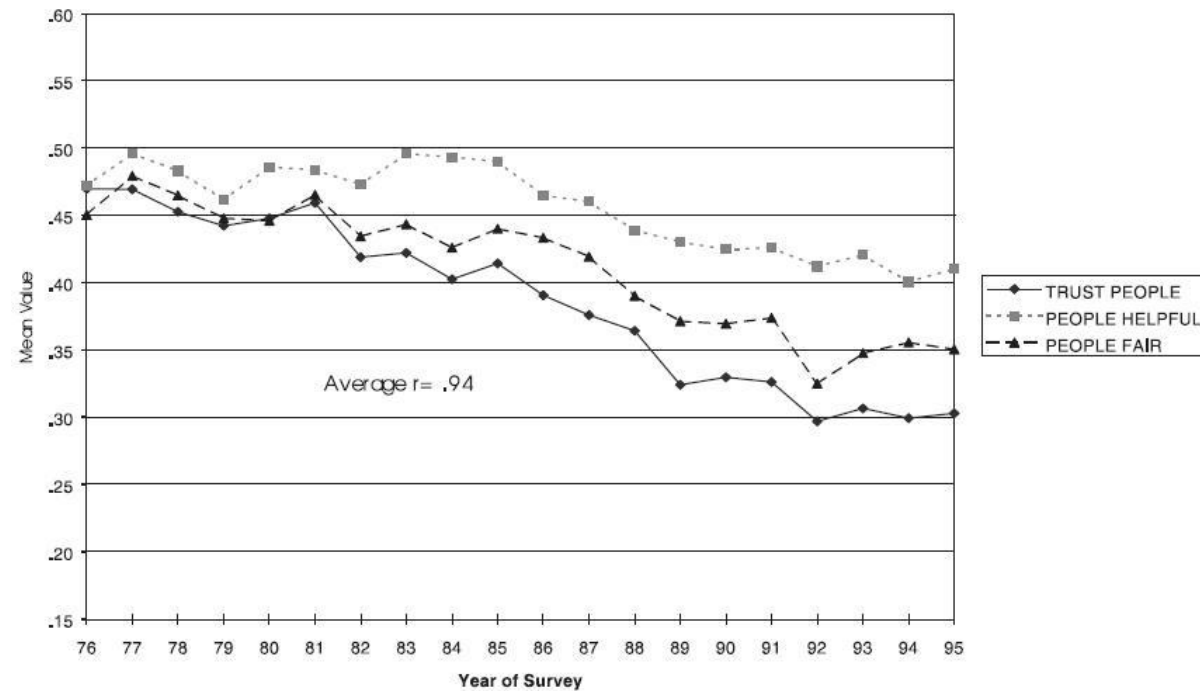


Figure 3A.2: Rahn and Transue's (1998: 549, Figure 1) representation of the trajectories of the three social trust items. Reproduced with permission from John Wiley & Sons. Copyright © 1998 International Society of Political Psychology. Published by Blackwell Publishers, 350 Main Street, Malden, MA 02148, USA, and 108 Cowley Road, Oxford, OX4 1JF, UK.

Appendix 3B

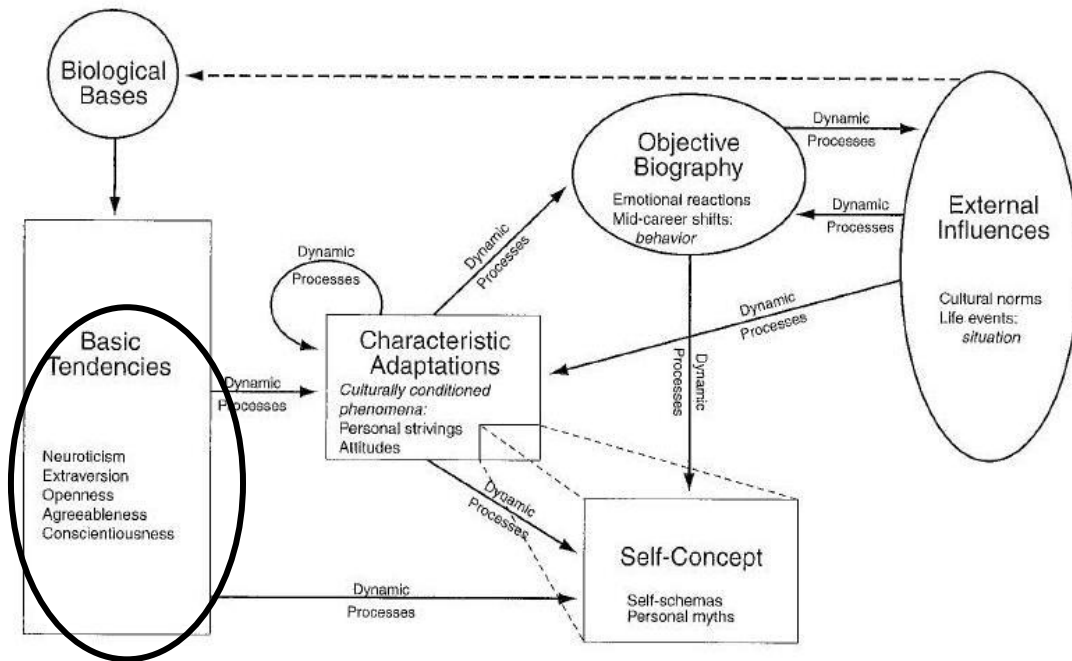


Figure 3B: Costa and McCrae's (1999) five-factor personality system (circle directing attention to the basic tendencies added by me). Figure taken from J. S Wiggins (Ed), The five-factor model of personality. Copyright © 1996 Guilford Publications Inc. Reprinted with permission of Guilford Press.

Appendix 4A.1

Table 4A.1: Descriptive data (gender, age and level of education)

	<i>N</i> ≥	Male (%)	Age in years (%) ^a								Highest level of education - ISCED (%)				
			15-24		25-49		50-64		65+		0-1	2	3	4	5-6
			ESS3	Euro.	ESS3	Euro.	ESS3	Euro.	ESS3	Euro.					
Austria	2336	46.2	20.8	12.3	37.5	37.7	16.9	17.6	8.9	16.4	.9	22.3	62.0	7.7	7.1
Belgium	1766	46.6	14.7	12.1	34.1	35.6	18.4	18.1	15.7	17.2	12.6	23.3	36.2	.0	27.8
Bulgaria	1239	40.0	11.4	13.6	31.9	35.5	25.4	20.1	15.4	17.2	6.9	24.8	47.5	.0	20.9
Switzerland	1748	46.1	10.8	11.8	37.0	37.4	20.7	18.8	15.6	16.0	6.3	19.5	47.0	4.3	22.9
Cyprus	915	46.5	13.0	16.0	36.0	36.0	20.8	16.5	11.0	12.2	17.0	11.5	46.0	.0	25.5
Germany	2780	49.2	10.5	11.8	37.2	36.5	20.3	18.4	17.9	19.3	3.0	12.1	56.5	6.9	21.6
Denmark	1449	48.9	7.7	11.2	33.0	35.1	24.4	19.9	16.4	15.2	1.6	18.8	36.4	.0	43.1
Estonia	1419	43.3	14.4	14.8	32.5	35.1	18.4	18.2	19.7	16.9	3.9	22.0	39.3	3.9	30.9
Spain	1795	48.5	12.1	11.8	39.8	40.6	16.1	16.5	17.4	16.6	35.9	20.7	16.8	8.5	18.0
Finland	1644	47.5	10.8	12.5	31.1	33.2	23.0	21.1	17.9	16.0	18.8	13.7	36.1	.0	31.4
France	1951	48.5	11.4	13.0	37.3	34.2	20.6	17.9	12.1	16.3	16.1	13.8	43.8	.0	26.3
United Kingdom	2292	47.2	12.3	13.0	34.0	35.3	19.5	17.8	16.2	15.9	23.6	23.6	12.7	.0	40.1
Hungary	1407	41.7	10.0	12.9	34.6	35.8	22.9	20.1	17.1	15.8	5.2	28.6	45.8	5.6	14.7
Ireland	1525	45.6	13.7	15.1	37.2	38.0	17.2	15.4	11.4	10.9	15.6	21.9	22.5	.0	40.1
Netherlands	1814	47.7	9.4	12.0	37.9	36.5	21.0	19.0	13.5	14.3	9.5	31.4	27.5	7.3	24.2
Norway	1530	49.8	11.2	12.4	36.3	35.2	20.5	18.2	12.7	14.8	1.1	17.5	34.6	9.8	37.0
Poland	1620	47.2	17.3	16.2	33.9	36.0	19.3	18.2	12.7	13.0	2.7	26.2	55.9	3.8	11.4
Portugal	2114	41.0	10.9	12.1	32.6	37.0	21.3	17.8	19.5	17.3	58.8	14.9	16.1	.0	10.1
Russian Federation	2293	41.4	17.1	17.0	35.8	37.7	17.7	16.6	14.1	13.4	6.4	12.4	32.8	.0	48.4
Sweden	1582	48.8	11.1	12.4	32.3	33.3	23.3	19.7	15.9	17.3	12.5	18.3	42.1	.0	27.1
Slovenia	1324	44.8	14.9	13.1	33.6	38.0	20.6	19.2	16.8	15.6	3.2	24.2	52.0	.0	20.7
Slovakia	1621	48.2	15.1	15.8	38.2	37.8	18.6	17.9	11.5	11.8	2.1	18.9	67.4	.0	11.6
Ukraine	1859	42.7	11.6	15.8	31.9	36.4	21.7	17.2	20.2	16.2	11.3	8.9	27.1	.0	52.7

^a Data taken from Eurostat (Euro.) are % of entire population; ESS rescaled to account for this. ^b % 25-64 year olds who have attained ISCED 3 – 6. ESS data weighted by design weight, calculated from Round 3 integrated dataset (edition 3.4). “NA” indicates data not available.

Appendix 4A.2

Table 4A.2: Descriptive data (occupation, financial comfort and generalised trust)

	Occupation (%)		Feeling about household income nowadays					Generalised trust	
	N	Managerial/ Professional	N	Living comfortably	Coping	Difficult	Very difficult	N	Mean (SD)
Austria	2326	16.9	2279	39.1	50.6	7.5	2.7	2326	5.12 (2.35)
Belgium	1767	23.1	1753	37.8	41.8	16.0	4.4	1767	4.98 (2.28)
Bulgaria	1248	17.1	1241	1.0	24.0	39.3	35.6	1236	3.39 (2.77)
Switzerland	1758	19.1	1741	51.1	37.4	8.5	3.0	1746	5.69 (2.16)
Cyprus	933	10.4	919	20.6	55.2	21.8	2.5	925	4.24 (2.64)
Germany	2828	17.1	2801	24.9	56.8	13.8	4.5	2824	4.79 (2.30)
Denmark	1451	30.0	1435	67.7	26.7	4.3	1.4	1446	7.05 (2.07)
Estonia	1420	23.7	1390	9.2	60.4	22.7	7.7	1397	5.34 (2.20)
Spain	1802	12.3	1784	32.8	50.6	13.9	2.7	1797	5.10 (1.99)
Finland	1645	24.3	1641	23.3	65.3	9.4	2.0	1645	6.58 (1.85)
France	1948	21.1	1950	31.3	54.5	12.8	1.4	1951	4.47 (2.23)
United Kingdom	2301	24.7	2285	42.5	42.5	12.6	2.3	2292	5.37 (2.13)
Hungary	1409	11.7	1405	5.6	49.5	32.9	12.0	1408	4.35 (2.55)
Ireland	1582	26.4	1562	48.3	40.8	9.4	1.5	1587	5.35 (2.36)
Netherlands	1814	33.0	1807	48.0	40.3	8.9	2.8	1815	5.78 (2.03)
Norway	1533	17.1	1532	56.2	36.2	5.9	1.7	1533	6.89 (1.77)
Poland	1629	15.1	1619	6.1	58.2	32.6	3.1	1624	4.08 (2.38)
Portugal	2117	8.2	2076	8.3	52.9	25.8	13.0	2082	4.07 (2.34)
Russian Federation	2306	17.7	2270	4.2	32.6	40.5	22.7	2285	3.92 (2.75)
Sweden	1585	23.5	1577	59.1	33.0	6.7	1.3	1583	6.34 (2.02)
Slovenia	1329	18.9	1310	45.8	42.4	9.1	2.7	1325	4.10 (2.64)
Slovakia	1670	17.1	1649	11.1	46.7	30.5	11.7	1663	4.29 (2.37)
Ukraine	1877	21.6	1828	.8	20.7	48.5	30.0	1841	4.10 (2.85)

Data source: ESS Round 3 integrated dataset (edition 3.4). Data weighted by design weight.

Appendix 4A.3

Table 4A.3: Descriptive data (Schwartz's human values constructs)

	Schwartz's value priorities, centred: Mean (SD)						Self-transcendence	Conformity/ Tradition
	<i>N</i> ≥	Security	Universalism	Benevolence	Tradition	Conformity		
Austria	2331	0.28 (0.83)	0.46 (0.71)	0.71 (0.64)	-0.31 (1.01)	-0.57 (0.97)	.58 (.56)	-.44 (.83)
Belgium	1767	0.18 (0.83)	0.60 (0.56)	0.77 (0.56)	0.08 (0.85)	-0.19 (0.90)	.68 (.45)	-.05 (.70)
Bulgaria	1244	0.76 (0.79)	0.44 (0.63)	0.65 (0.64)	0.30 (1.01)	0.14 (0.98)	.55 (.51)	.22 (.84)
Switzerland	1744	0.17 (0.86)	0.78 (0.59)	0.82 (0.57)	-0.01 (0.89)	-0.58 (0.95)	.80 (.47)	-.30 (.72)
Cyprus	915	0.74 (0.59)	0.39 (0.52)	0.68 (0.51)	0.30 (0.71)	-0.30 (0.85)	.52 (.43)	.05 (.66)
Germany	2826	0.32 (0.90)	0.60 (0.65)	0.75 (0.63)	-0.06 (0.92)	-0.32 (1.01)	.68 (.52)	-.19 (.80)
Denmark	1451	-0.17 (0.93)	0.64 (0.67)	0.99 (0.58)	-0.27 (0.95)	-0.04 (1.02)	.81 (.50)	-.16 (.80)
Estonia	1418	0.59 (0.78)	0.62 (0.62)	0.63 (0.66)	0.04 (0.93)	0.00 (0.91)	.62 (.52)	.02 (.76)
Spain	1800	0.67 (0.74)	0.74 (0.54)	0.85 (0.57)	0.21 (0.88)	0.03 (0.87)	.80 (.46)	.12 (.74)
Finland	1644	0.43 (0.93)	0.80 (0.66)	0.76 (0.67)	-0.10 (0.88)	0.06 (0.96)	.78 (.55)	-.02 (.76)
France	1951	0.22 (0.96)	0.94 (0.69)	0.82 (0.73)	0.09 (0.96)	-0.33 (0.98)	.88 (.56)	-.12 (.73)
United Kingdom	2300	0.40 (0.86)	0.59 (0.68)	0.77 (0.63)	-0.04 (0.94)	-0.23 (1.04)	.68 (.52)	-.14 (.81)
Hungary	1413	0.76 (0.74)	0.46 (0.60)	0.55 (0.67)	0.07 (0.93)	-0.48 (0.92)	.51 (.49)	-.21 (.73)
Ireland	1603	0.49 (0.84)	0.59 (0.66)	0.67 (0.69)	0.15 (0.93)	-0.20 (1.02)	.63 (.54)	-.02 (.79)
Netherlands	1816	0.05 (0.78)	0.59 (0.58)	0.63 (0.58)	-0.21 (0.89)	-0.10 (0.85)	.61 (.46)	-.15 (.73)
Norway	1533	0.15 (0.87)	0.62 (0.67)	0.81 (0.61)	-0.21 (0.97)	0.22 (0.96)	.72 (.50)	.00 (.80)
Poland	1625	0.58 (0.73)	0.56 (0.52)	0.48 (0.60)	0.23 (.085)	0.32 (0.75)	.52 (.44)	.27 (.67)
Portugal	2106	0.47 (0.73)	0.52 (0.56)	0.64 (0.65)	0.22 (0.84)	-0.25 (0.95)	.58 (.51)	-.01 (.74)
Russian Federation	2313	0.76 (0.82)	0.44 (0.66)	0.41 (0.70)	0.13 (1.02)	-0.11 (0.98)	.42 (.54)	.01 (.85)
Sweden	1585	-0.10 (0.89)	0.67 (0.69)	0.81 (0.66)	-0.06 (0.90)	-0.24 (0.92)	.74 (.54)	-.15 (.73)
Slovenia	1329	0.28 (0.78)	0.46 (0.58)	0.46 (0.59)	0.16 (0.84)	-0.19 (0.90)	.46 (.45)	-.02 (.73)
Slovakia	1668	0.64 (0.69)	0.44 (0.54)	0.35 (0.62)	0.24 (0.86)	0.15 (0.77)	.40 (.47)	.20 (.69)
Ukraine	1853	0.77 (0.83)	0.57 (0.63)	0.50 (0.70)	0.19 (0.94)	0.23 (0.93)	.54 (.54)	.21 (.76)

Data source: ESS Round 3 integrated dataset (edition 3.4). Data weighted by design weight.

Appendix 4A.4

Table 4A.4: Descriptive data (Level 2 variables)

	GDP	Gini	CPI	Government effectiveness
Austria	32131.49	31.00	8.22	1.90
Belgium	30998.35	25.00	7.25	1.85
Bulgaria	2950.48	31.90	3.98	0.11
Switzerland	46004.74	33.10	8.83	2.00
Cyprus	19129.42		5.70	1.19
Germany	29714.24	28.30	7.80	1.63
Denmark	40829.07	23.20	9.50	2.17
Estonia	8162.93	37.20	5.97	0.92
Spain	21863.75	32.50	6.98	1.55
Finland	32411.75	26.90	9.70	2.18
France	29395.47	32.70	6.98	1.69
United Kingdom	33030.64	36.80	8.58	1.82
Hungary	8693.41	24.40	5.00	0.92
Ireland	40967.49	35.90	7.37	1.63
Netherlands	33869.22	30.90	8.87	1.99
Norway	53990.30	25.80	8.75	1.94
Poland	6561.72	34.10	3.72	0.51
Portugal	15801.18	38.50	6.43	1.06
Russian Federation	3966.00	40.00	2.57	-0.47
Sweden	35668.22	25.00	9.20	1.99
Slovenia	15116.93	28.40	5.93	0.93
Slovakia	8781.73	25.80	4.02	0.76
Ukraine	1369.62	29.00	2.40	-0.61

GDP – mean score from 2001 – 2006

Gini – score from date nearest to 2006, as available

CPI – mean score from 2001 – 2006

Government effectiveness – mean score from 2000, 2002 – 2006 (no data for 2001)

Appendix 4B

Table 4B: Pearson correlations (variables in bold text included in the models)

	Generalised trust	Financial comfort	Universalism	Benevolence	Security	Tradition	Conformity	Self-transcendence	Conformity/Tradition	Openness	Age	Gender (m = 1)	Education	Occupation	GDP	Gini	CPI	Gov Effectiveness
Generalised trust	1																	
Financial comfort	-.268	1																
Universalism	.092	-.008	1															
Benevolence	.106	-.061	.302	1														
Security	-.197	.225	<i>.016</i>	-.021	1													
Tradition	-.096	.157	.155	.133	.248	1												
Conformity	-.053	.102	.008	-.020	.249	.350	1											
Self-transcendence	.115	-.033	.815	.667	.004	.170	.003	1										
Conformity/Tradition	-.083	.155	.095	.066	.276	.756	.763	.106	1									
Openness	.103	-.181	-.191	-.175	-.466	-.499	-.482	-.242	-.645	1								
Age	-.032	.089	.184	.122	.242	.358	.325	.186	.384	-.305	1							
Gender (m = 1)	.030	-.091	-.111	-.133	-.122	-.100	-.027	-.135	-.072	.102	-.045	1						
Education	.127	-.169	.020	-.034	-.180	-.197	-.149	-.007	-.210	.191	-.220	.045	1					
Occupation	.128	-.179	.052	-.003	-.137	-.110	-.058	.033	-.097	.109	.036	.057	.395	1				
GDP	.310	-.467	.102	.183	-.238	-.125	-.089	.165	-.129	.163	-.004	.043	.022	.059	1			
Gini	-.146	.166	-.010	-.058	.127	.066	-.011	-.036	.033	-.065	.011	-.036	-.112	-.024	-.274	1		
CPI	.317	-.466	.101	.193	-.241	-.132	-.098	.170	-.139	.173	.011	.043	-.045	.060	.900	-.286	1	
Gov Effectiveness	.293	-.479	.102	.188	-.232	-.116	-.101	.167	-.131	.170	-.004	.049	-.061	.050	.883	-.345	.965	1

Coefficients in bold text are significant at $p < .001$; those in italic text are significant at $p < .05$

Appendix 5A

Questionnaire content

Please enter your ID code and check to make sure you have entered it correctly. This code is numeric only, so any '0' characters will be a zero.

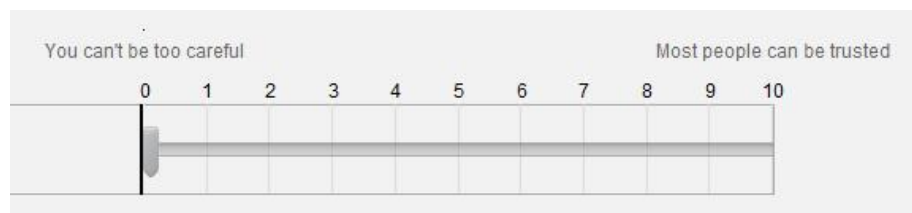
This questionnaire will ask you about yourself and your opinions. Your answers are completely anonymous and the data you provide will only be used for statistical analysis. You are free to leave the survey at any time if you wish to, without penalty.

Many of the questions are written in American English - this was unavoidable due to copyright and I hope it won't cause you any problems. Please read each question and its response options carefully before selecting your answer and be as honest as possible. If you do encounter any problems, please raise your hand and an experimenter will come over to you.

Please note that there is no 'back' button in the questionnaire and at no time should you click on the 'back' button in the web browser - this would make the survey inaccessible and the answers you have already given would be lost.

Please click 'next' when you are ready to begin.

Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? Please indicate on a scale from 0 to 10, where 0 means you can't be too careful and 10 means that most people can be trusted.



(Generalised trust question. Source: European Social Survey)

Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?

[Sliding scale as above, with end points: "Most people would try to take advantage of me" (0) and "Most people would try to be fair" (10)]

(Attitudes towards risk. Source: GSOEP 2004)

To what degree do the following statements apply to you personally?

Please answer according to the following scale:

1 means “does not apply to me at all”

7 means “applies to me perfectly”

- (a) If someone does me a favour, I am prepared to return it (positive)
- (b) If I suffer a serious wrong, I will take revenge as soon as possible, no matter what the cost (negative)
- (c) If somebody puts me in a difficult position, I will do the same to him/ her (negative)
- (d) I go out of my way to help somebody who has been kind to me before (positive)
- (e) If somebody offends me, I will offend him/ her back (negative)
- (f) I am ready to undergo personal costs to help somebody who helped me before (positive)

(Positive and negative reciprocity. Source: GSOEP)

Please tell me your gender (if you are transgendered, please select the gender you identify with).

[Male/ Female]

How well would you say you yourself are managing financially these days? Would you say you are...

- 1 Living comfortably
- 2 Doing alright
- 3 Just about getting by
- 4 Finding it quite difficult
- 5 Finding it very difficult?

(Financial comfort. Source: BHPS; Understanding Society wave 3)

(For Schwartz’s (2001) Human Values Scale questions, respondents are filtered to the gender-appropriate version of this scale. This version is for males.)

Here we briefly describe some people. Please read each description and tick the box on each line that shows how much each person is or is not like you.

Response options:

1. Very much like me
2. Like me
3. Somewhat like me
4. A little like me
5. Not like me
6. Not like me at all

- A Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.
- B It is important to him to be rich. He wants to have a lot of money and expensive things.
- C He thinks it is important that every person in the world should be treated equally. He believes everyone should have equal opportunities in life.
- D It's important to him to show his abilities. He wants people to admire what he does.
- E It is important to him to live in secure surroundings. He avoids anything that might endanger his safety.
- F He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life.
- G He believes that people should do what they're told. He thinks people should follow rules at all times, even when no-one is watching.
- H It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.
- I It is important to him to be humble and modest. He tries not to draw attention to himself.
- J Having a good time is important to him. He likes to "spoil" himself.
- K It is important to him to make his own decisions about what he does. He likes to be free and not depend on others.
- L It's very important to him to help the people around him. He wants to care for their well-being.
- M Being very successful is important to him. He hopes people will recognise his achievements.
- N It is important to him that the government ensures his safety against all threats. He wants the state to be strong so it can defend its citizens.
- O He looks for adventures and likes to take risks. He wants to have an exciting life.
- P It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.
- Q It is important to him to get respect from others. He wants people to do what he says.
- R It is important to him to be loyal to his friends. He wants to devote himself to people close to him.
- S He strongly believes that people should care for nature. Looking after the environment is important to him.

- T Tradition is important to him. He tries to follow the customs handed down by his religion or his family.
- U He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.

(Schwartz's Human Values Scale. Source: European Social Survey)

The 240 items measuring personality appeared next in the questionnaire. However, due to copyright, the questions cannot be reproduced here. The NEO-PI-3 measures the Big Five personality traits, each comprising six facets. Each facet is measured by six items. Permission was granted for me to reproduce three items in this thesis. One item measuring *trust* features in Section 5.4.3.1, and two items measuring *gregariousness* and *warmth* appear in Section 5.4.3.2.

(Personality measures. Source: NEO-PI-3)

I would now like to ask you some demographic questions about yourself.

Firstly, how old are you?
[Sliding scale from 18 to 30]

Do you consider yourself as belonging to any particular religion or denomination?
[Yes/ No]

If [Yes]:

Which religion or denomination do you belong to?
[List taken from the UK census, with additional item "I'd rather not say"]

Regardless of whether you belong to a particular religion, how religious would you say you are?
[Sliding scale from "Not at all religious" (0) to "Very religious"]

What is your ethnic group?
[List taken from UK census, with additional item "I'd rather not say"]

The next few questions relate to your studies here at Essex.

Are you an undergraduate or postgraduate?

[Undergraduate/ Postgraduate]

Which department are you in? If you have ties to more than one department, please select the one you regard as your primary discipline.

[List of University of Essex departments, taken from the EssexLab registration form]

Are you registered as a full-time or part-time student?

[Full-time/ Part-time]

Which year of study are you in? If you are registered as a part-time student, please report the year you would be in if you were studying full-time (for example, if you are in your third year of part-time study and this is equivalent to the second year of a full-time degree, you would select "second").

[First, Second, Third, Fourth, Other]

Finally, I would like to ask you a couple of questions about the area you lived in before coming to university.

Firstly, how safe did you - or would you - feel walking alone in this area after dark?

1. Very safe
2. Safe
3. Unsafe
4. Very unsafe

(Source: European Social Survey)

Secondly, and again thinking of the area you lived in before coming to university... Please think about the immediate neighbourhood of your home. Did you have very many reasons, many reasons, a few reasons, or no reason at all to complain about each of the following problems?

	Very many reasons	Many reasons	A few reasons	No reason at all
Noise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Air pollution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of access to recreational or green areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Water quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crime, violence or vandalism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Litter or rubbish in the street	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(Source: EQLS 2007)

You have reached the end of the questionnaire. Thank you for taking part!

The next screen will confirm that your data has been recorded. You will then be free to leave the Lab - please do so as quietly as possible to avoid distracting other participants. Please remember to take your ID code with you and to bring this back with you next week.

Please click 'next' to submit your data.

If you have any concerns about your wellbeing, Student Support or Nightline may be able to help. During term time, the Student Support office is open Monday to Friday from 10:30am - 4pm. They are based in room 4N.6.2 and can be contacted via telephone on 01206 872365. Nightline is open from 10pm - 8am each night during term time: 01206 872020. Further information about both services (including alternative contact details) can be found online.

Appendix 5B.1

[ESSEXLab Header]

Consent form: Session 1

In this session, you will be asked to complete a questionnaire that should take about 35 minutes. The questionnaire will ask you about yourself and your opinions. The data collected will be stored online in a user account on the Qualtrics online survey platform. Only the primary experimenter has the password to this account.

The data collected will be completely anonymous. You will be identified only by a unique ID code, which is stapled above (face down). Your code will remain attached to this consent form until next week's session. Until then, this form will be stored securely in accordance with EssexLab rules and nobody will have access to both your ID code and the data you have given. After next week's session, the ID code will be removed and disposed of.

When downloaded from Qualtrics, the data will be stored on the primary experimenter's computer. Your data from today will be matched to your data from next week's session and used only for statistical analysis. The results will be reported in the primary experimenter's PhD thesis and may be published in one or more journal articles. In accordance with EssexLab rules, the dataset may be made available to other users after this project has finished.

For your participation in this session you will receive £5. This compensates you for the time taken and includes a £2.50 show up fee. As mentioned in the invitation email, you will receive this payment at the end of next week's session.

Your participation in this study is purely voluntary and you may withdraw your participation or your data at any time without giving a reason.

If you have any questions about this study, you can contact Elissa via: esibley@essex.ac.uk
If you have any immediate questions please ask an experimenter and they will try to help.

I have read the above description of this study, my questions have been answered and I give my consent to participate.

Signature: _____

Name (printed): _____

Date: _____

Appendix 5B.2

PARTICIPANT INFORMATION SHEET

Session 1

This session will involve filling in a questionnaire online. It should take on average 35 minutes.

Please take your time to read the on-screen instructions, as well as the questions and the available response options. Please answer the questions as honestly as possible. Your responses to the questionnaire are completely anonymous and it will not be possible for anybody to identify you from your data.

The first page asks you to enter a password in order to start the questionnaire. This password will appear on the two screens at the front of the Lab when we are ready to begin. The second page will ask you to enter your ID code. This is the code that's printed (face down) on the slip of paper attached to your consent form. Please enter this code carefully to ensure accuracy and then click 'next'. The on-screen instructions will lead you through the questionnaire.

As described previously, this is the first of two sessions and you will receive your £5 payment for this session next week.

Please make sure your mobile phone and any other devices are on 'silent' and do not use them in the Lab. Also, please do not communicate with the other participants. If you have a question, raise your hand and an experimenter will come over to you.

Please leave these instructions, as well as your signed consent form and your ID code on the desk when you leave.

Appendix 5B.3

[ESSEXLab Header]

Consent form: Session 2

In this session you will be asked to play a game that should take about 20 minutes. The decisions you make during the game will be recorded and stored on the secure EssexLab server before being downloaded onto the experimenter's computer.

All data will be recorded and stored anonymously - each participant is identified only by a unique, randomly-selected ID code (this will be the same code as you were given in Session 1). Your code will be used to match your data from the two sessions and cannot be used to trace your data back to you. At the end of this session, your code will be removed from your consent forms and disposed of.

The resulting dataset will be used for statistical analysis. The results will be reported in the experimenter's PhD thesis and the findings may be published in one or more journal articles. In accordance with EssexLab rules, the dataset may be made available to other users after the project has finished.

For your participation in this session you will receive a £2.50 show up fee plus possible additional earnings as described in the instructions. The show up fee and any additional earnings will be paid to you at the end of the experiment, along with your £5 payment for Session 1.

If you have any questions about this study, you can contact Elissa via: esibley@essex.ac.uk

Your participation in this study is purely voluntary and you may withdraw your participation or your data at any time without giving a reason.

If you have any immediate questions please ask an experimenter and they will try to help.

I have read the above description of this study, my questions have been answered and I give my consent to participate.

Signature: _____

Name (printed): _____

Date: _____

Appendix 5B.4

PARTICIPANT INFORMATION SHEET

Session 2

This session will involve playing a game. In this game there are two people, Player 1 and Player 2. Everybody will play this game twice – once as Player 1 and once as Player 2. Half of you will play the first game as Player 1 and half will play as Player 2. For each game you will be randomly and anonymously paired with a different person in the Lab.

The game will be played via computer. There will be no face-to-face interaction and there will be no way for any participant to find out who they were paired with.

Rules of the game

Player 1 will be given £5 at the start of the game. This is theirs to keep, or if they wish to they can invest it with Player 2. Player 2 will start the game with zero.

If Player 1 decides to keep their £5, the game is over; Player 1 scores £5 and Player 2 scores £0.

If Player 1 decides to invest their £5, it becomes £15: Player 2 would then have £15 and Player 1 would have zero.

Player 2 must decide how much of this £15 to send to Player 1. Player 2 has only two alternatives – they may send Player 1 either £0 or £10. Player 2 is asked to make this decision before they know whether Player 1 has invested or kept their £5.

The amount of money played for in this game directly equates to real money. If Player 1 decides to keep their £5, this decision is final and determines both players' scores for that game (Player 1 scores £5, Player 2 scores £0). If Player 1 invests, Player 2's decision on how to allocate the £15 is final: If they decide to give Player 1 £0, Player 1 will score £0 while Player 2 will score £15; if they give Player 1 £10, Player 1 will score £10 and Player 2 will score £5.

You will be told your scores after both games have been played. At this point, you will also find out which game you will be paid for. You will be paid according to your score in one of the two games, with Game 1 or Game 2 having been selected at random by the computer program. For example, if Game 1 is selected, everybody in this Lab session will be paid according to their score in Game 1.

As with last week, please make sure your mobile phone and any other electronic devices are on 'silent' and do not use them in the Lab. Also, please do not communicate with the other participants. If you have a question, raise your hand and an experimenter will come over to you.

Appendix 5C

Table 5C: Correlation coefficients (Spearman's rho)

	GTQ	Behav. Trst	Behav. TW	N1	N2	N3	N4
Generalised trust	1.000	.005	.135	-.105	-.213*	-.223**	-.130
Behavioural trust	.005	1.000	.412**	.002	-.048	.107	-.039
Behavioural trustworthiness	.135	.412**	1.000	-.011	-.128	.012	-.078
N1 Anxiety	-.105	.002	-.011	1.000	.149	.518**	.677**
N2 Angry hostility	-.213*	-.048	-.128	.149	1.000	.158	.239**
N3 Depression	-.223**	.107	.012	.518**	.158	1.000	.564**
N4 Self-consciousness	-.130	-.039	-.078	.677**	.239**	.564**	1.000
N5 Impulsiveness	-.168*	-.045	-.147	.209*	.349**	.252**	.257**
N6 Vulnerability	-.211*	-.124	-.050	.419**	.210*	.499**	.515**
E1 Warmth	.226**	-.078	.055	-.023	-.288**	-.175*	-.223**
E2 Gregariousness	.114	-.241**	-.212*	-.100	-.128	-.092	-.232**
E3 Assertiveness	.017	.027	.063	-.233**	.210*	-.218**	-.348**
E4 Activity	.036	.005	-.014	-.243**	.079	-.352**	-.400**
E5 Excitement-seeking	.038	.049	.026	-.192*	-.047	-.076	-.249**
E6 Positive emotions	.307**	.006	.023	-.274**	-.241**	-.306**	-.417**
O1 Fantasy	.032	.115	.089	-.045	-.001	.135	-.029
O2 Aesthetics	.130	.270**	.160	.082	-.032	.169*	.058
O3 Feelings	.068	.155	.056	-.044	.111	.160	-.008
O4 Actions	.209*	.084	.151	-.285**	-.170*	-.077	-.258**
O5 Ideas	.018	.180*	.068	-.128	-.177*	.116	-.038
O6 Values	.130	-.043	.034	-.014	-.236**	-.011	.073
A1 Trust	.676**	.045	.204*	-.175*	-.355**	-.266**	-.227**
A2 Straightforwardness	.122	.079	.158	.179*	-.387**	-.011	.065
A3 Altruism	.172*	.117	.144	.084	-.397**	.003	-.085
A4 Compliance	.086	.177*	.196*	.135	-.523**	.057	.149
A5 Modesty	.003	.120	.169*	.222**	-.172*	.279**	.151
A6 Tender-mindedness	.174*	.075	.156	.048	-.147	.084	.021
C1 Competence	.068	-.012	-.007	-.189*	-.128	-.368**	-.270**
C2 Order	-.098	-.102	-.094	-.046	-.056	-.210*	-.140
C3 Dutifulness	-.005	-.030	.034	.030	-.174*	-.171*	-.088
C4 Achievement striving	-.076	-.080	-.057	-.067	.017	-.205*	-.217*
C5 Self-discipline	.012	-.224**	-.113	-.164	-.084	-.441**	-.344**
C6 Deliberation	-.006	-.116	-.060	.140	-.162	-.079	.036
Neuroticism	-.257**	-.017	-.097	.662**	.513**	.722**	.741**
Extraversion	.223**	-.060	.003	-.232**	-.064	-.249**	-.409**
Openness	.106	.249**	.143	-.076	-.071	.167*	-.020
Agreeableness	.313**	.139	.239**	.153	-.493**	.051	.006
Agreeableness (A1 standardised)	.089	.159	.287**	.168*	-.385**	.128	.065
Conscientiousness	-.047	-.106	-.074	-.108	-.113	-.329**	-.219**
Age	-.096	-.022	.133	-.056	.112	-.008	.014
Gender	-.114	-.045	.170*	-.036	.204*	.006	-.064
Year of study	-.090	-.162	-.084	.002	.136	.045	.081
Charity donation	-.013	.193*	.239**	.156	-.094	.083	.091
Misunderstood rules	-.163	-.072	-.261**	.135	.044	.081	.161
Sender Game 1	-.083	.217*	-.051	.058	.000	.062	.145
Betrayal aversion	.012	-.181*	-.115	-.038	.009	-.018	.043
Financial insecurity	-.156	.066	-.109	.149	.238**	.235**	.235**
Positive reciprocity	-.065	.064	.181*	-.002	-.171*	-.044	-.176*
Negative reciprocity	-.024	-.036	-.114	-.043	.376**	-.107	-.080
Willingness to take risks	.146	.109	.059	-.325**	-.099	-.050	-.381**
Double showup fee	.092	.079	.106	-.026	-.109	-.002	-.034

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 5C: Correlation coefficients (Spearman's rho)

	N5	N6	E1	E2	E3	E4	E5
Generalised trust	-.168*	-.211*	.226**	.114	.017	.036	.038
Behavioural trust	-.045	-.124	-.078	-.241**	.027	.005	.049
Behavioural trustworthiness	-.147	-.050	.055	-.212*	.063	-.014	.026
N1 Anxiety	.209*	.419**	-.023	-.100	-.233**	-.243**	-.192*
N2 Angry hostility	.349**	.210*	-.288**	-.128	.210*	.079	-.047
N3 Depression	.252**	.499**	-.175*	-.092	-.218**	-.352**	-.076
N4 Self-consciousness	.257**	.515**	-.223**	-.232**	-.348**	-.400**	-.249**
N5 Impulsiveness	1.000	.209*	.081	.093	.154	.112	.166
N6 Vulnerability	.209*	1.000	-.141	-.102	-.251**	-.346**	-.208*
E1 Warmth	.081	-.141	1.000	.539**	.105	.284**	.385**
E2 Gregariousness	.093	-.102	.539**	1.000	.219**	.253**	.385**
E3 Assertiveness	.154	-.251**	.105	.219**	1.000	.433**	.167*
E4 Activity	.112	-.346**	.284**	.253**	.433**	1.000	.266**
E5 Excitement-seeking	.166	-.208*	.385**	.385**	.167*	.266**	1.000
E6 Positive emotions	.054	-.388**	.568**	.316**	.224**	.465**	.357**
O1 Fantasy	.305**	-.012	.261**	.114	.083	.012	.291**
O2 Aesthetics	.280**	.001	.252**	.076	-.011	.052	.216*
O3 Feelings	.294**	-.037	.316**	.199*	.176*	.135	.298**
O4 Actions	.021	-.234**	.278**	.266**	.138	.249**	.446**
O5 Ideas	.169*	-.215*	.148	-.023	.021	.063	.232**
O6 Values	.069	-.119	.187*	.082	-.082	-.140	.026
A1 Trust	-.215*	-.213*	.296**	.146	-.082	.100	.087
A2 Straightforwardness	-.278**	.122	.192*	-.056	-.272**	-.046	-.140
A3 Altruism	-.114	-.196*	.542**	.216*	-.018	.108	.161
A4 Compliance	-.241**	.051	.213*	.017	-.376**	-.093	-.136
A5 Modesty	-.074	.122	-.027	-.224**	-.232**	-.168*	-.112
A6 Tender-mindedness	-.035	-.142	.141	.024	-.050	.062	.010
C1 Competence	-.278**	-.379**	.182*	-.018	.356**	.299**	-.117
C2 Order	-.185*	-.233**	.011	.026	.115	.270**	-.049
C3 Dutifulness	-.103	-.213*	.264*	-.019	.119	.277**	-.049
C4 Achievement striving	-.030	-.325**	.202*	.029	.345**	.505**	.086
C5 Self-discipline	-.175*	-.347**	.205*	.168*	.352**	.433**	-.035
C6 Deliberation	-.312**	-.066	.037	-.129	-.032	-.058	-.308**
Neuroticism	.464*	.610**	-.174*	-.125	-.188*	-.274**	-.157
Extraversion	.186*	-.305**	.660**	.653**	.489**	.625**	.560**
Openness	.260**	-.109	.290**	.098	.065	.137	.332**
Agreeableness	-.256**	-.061	.347**	.007	-.270**	-.025	-.068
Agreeableness (A1 standardised)	-.168*	.040	.250**	-.042	-.213*	-.030	-.069
Conscientiousness	-.252**	-.339**	.150	.006	.249**	.325**	-.129
Age	.133	.006	-.080	-.038	.157	.033	.040
Gender	.218**	.103	-.142	-.067	.245**	.112	.074
Year of study	.126	-.011	-.038	.020	.077	.078	.063
Charity donation	-.106	.000	.086	-.087	-.121	-.090	-.022
Misunderstood rules	.159	.089	.119	-.020	-.006	.061	-.013
Sender Game 1	-.036	-.055	.010	.045	.001	.044	-.029
Betrayal aversion	-.028	-.069	.018	-.063	-.082	-.128	-.022
Financial insecurity	.247**	.280**	-.029	-.046	.009	-.012	.095
Positive reciprocity	.015	-.143	.264**	.047	.157	.172*	.138
Negative reciprocity	.143	-.006	-.004	.087	.158	.050	.140
Willingness to take risks	-.025	-.270**	.105	.110	.107	.193*	.386**
Double showup fee	-.016	-.062	.154	-.003	.059	.052	.073

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 5C: Correlation coefficients (Spearman's rho)

	E6	O1	O2	O2	O4	O5	O6
Generalised trust	.307**	.032	.130	.068	.209*	.018	.130
Behavioural trust	.006	.115	.270**	.155	.084	.180*	-.043
Behavioural trustworthiness	.023	.089	.160	.056	.151	.068	.034
N1 Anxiety	-.274**	-.045	.082	-.044	-.285**	-.128	-.014
N2 Angry hostility	-.241**	-.001	-.032	.111	-.170*	-.177*	-.236**
N3 Depression	-.306**	.135	.169*	.160	-.077	.116	-.011
N4 Self-consciousness	-.417**	-.029	.058	-.008	-.258**	-.038	.073
N5 Impulsiveness	.054	.305**	.280**	.294**	.021	.169*	.069
N6 Vulnerability	-.388**	-.012	.001	-.037	-.234**	-.215*	-.119
E1 Warmth	.568**	.261**	.252**	.316**	.278**	.148	.187*
E2 Gregariousness	.316**	.114	.076	.199*	.266**	-.023	.082
E3 Assertiveness	.224*	.083	-.011	.176*	.138	.021	-.082
E4 Activity	.465**	.012	.052	.135	.249**	.063	-.140
E5 Excitement-seeking	.357**	.291**	.216*	.298**	.446**	.232**	.026
E6 Positive emotions	1.000	.223**	.253**	.340**	.286**	.204*	.121
O1 Fantasy	.223**	1.000	.343**	.357**	.331**	.249**	.248**
O2 Aesthetics	.253**	.343**	1.000	.507**	.264**	.444**	.190*
O3 Feelings	.340**	.357**	.507**	1.000	.146	.369**	.157
O4 Actions	.286**	.331**	.264**	.146	1.000	.202*	.186*
O5 Ideas	.204*	.249**	.444**	.369**	.202*	1.000	.346**
O6 Values	.121	.248**	.190*	.157	.186*	.346**	1.000
A1 Trust	.360**	.028	.127	.066	.227**	-.045	.091
A2 Straightforwardness	.126	-.020	-.023	-.086	-.023	-.093	.124
A3 Altruism	.494**	.252**	.296**	.289**	.159	.254**	.308**
A4 Compliance	.018	-.007	.141	-.090	.173*	.083	.147
A5 Modesty	-.056	.008	.110	-.080	.019	.033	.258**
A6 Tender-mindedness	.212*	.319**	.403**	.278**	.195*	.262**	.244**
C1 Competence	.188*	-.129	.001	.049	-.048	.177*	-.010
C2 Order	.039	-.103	-.155	-.180*	-.174*	-.019	-.054
C3 Dutifulness	.211*	.022	.027	.113	-.171*	.219*	.073
C4 Achievement striving	.234**	-.086	-.032	.026	.034	.099	-.013
C5 Self-discipline	.204*	-.140	-.089	-.070	-.062	-.061	-.075
C6 Deliberation	-.044	-.249**	-.199*	-.002	-.250**	-.007	-.052
Neuroticism	-.359**	.083	.157	.123	-.223**	-.020	-.037
Extraversion	.711**	.296**	.202*	.366**	.386**	.098	.087
Openness	.310**	.572**	.741**	.609**	.488**	.651**	.400**
Agreeableness	.268**	.099	.261**	.024	.207*	.090	.238**
Agreeableness (A1 standardised)	.174*	.109	.262**	.064	.105	.154	.241**
Conscientiousness	.161	-.185*	-.052	.001	-.166	.084	-.025
Age	-.041	.022	.025	.092	.053	-.027	.003
Gender	-.055	-.002	.040	.028	-.028	.095	-.077
Year of study	.002	.085	.008	.115	.114	-.009	-.076
Charity donation	-.023	.064	.182*	.107	-.015	.022	.179*
Misunderstood rules	-.021	.043	-.054	.084	-.263**	.012	.044
Sender Game 1	-.067	-.074	.052	.014	.033	.059	-.033
Betrayal aversion	.005	-.065	-.116	.075	-.131	.061	.083
Financial insecurity	-.048	.064	.124	.203*	.041	-.035	-.074
Positive reciprocity	.250**	.155	.229**	.222**	-.052	.195*	.090
Negative reciprocity	-.036	.029	-.130	-.002	-.068	-.153	-.077
Willingness to take risks	.220**	.230**	.228**	.140	.456**	.234**	-.031
Double showup fee	.143	.091	.098	.190*	.055	.180*	.148

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 5C: Correlation coefficients (Spearman's rho)

	A1	A2	A3	A4	A5	A6	C1
Generalised trust	.676**	.122	.172*	.086	.003	.174*	.068
Behavioural trust	.045	.079	.117	.177*	.120	.075	-.012
Behavioural trustworthiness	.204*	.158	.144	.196*	.169*	.156	-.007
N1 Anxiety	-.175*	.179*	.084	.135	.222**	.048	-.189*
N2 Angry hostility	-.355**	-.387**	-.397**	-.523**	-.172*	-.147	-.128
N3 Depression	-.266**	-.011	.003	.057	.279**	.084	-.368**
N4 Self-consciousness	-.227**	.065	-.085	.149	.151	.021	-.270**
N5 Impulsiveness	-.215*	-.278**	-.114	-.241**	-.074	-.035	-.278**
N6 Vulnerability	-.213*	.122	-.196*	.051	.122	-.142	-.379**
E1 Warmth	.296**	.192*	.542**	.213*	-.027	.141	.182*
E2 Gregariousness	.146	-.056	.216*	.017	-.224**	.024	-.018
E3 Assertiveness	-.082	-.272**	-.018	-.376**	-.232**	-.050	.356**
E4 Activity	.100	-.046	.108	-.093	-.168*	.062	.299**
E5 Excitement-seeking	.087	-.140	.161	-.136	-.112	.010	-.117
E6 Positive emotions	.360**	.126	.494**	.018	-.056	.212*	.188*
O1 Fantasy	.028	-.020	.252**	-.007	.008	.319**	-.129
O2 Aesthetics	.127	-.023	.296**	.141	.110	.403**	.001
O3 Feelings	.066	-.086	.289**	-.090	-.080	.278**	.049
O4 Actions	.227**	-.023	.159	.173*	.019	.195*	-.048
O5 Ideas	-.045	-.093	.254**	.083	.033	.262**	.177*
O6 Values	.091	.124	.308**	.147	.258**	.244**	-.010
A1 Trust	1.000	.278**	.378**	.309**	.104	.152	.097
A2 Straightforwardness	.278**	1.000	.352**	.474**	.418**	.116	.071
A3 Altruism	.278**	.352**	1.000	.325**	.264**	.447**	.169*
A4 Compliance	.309**	.474**	.325**	1.000	.324**	.241**	.025
A5 Modesty	.104	.418**	.264**	.324**	1.000	.307**	-.233**
A6 Tender-mindedness	.152	.116	.447**	.241**	.307**	1.000	.055
C1 Competence	.097	.071	.169*	.025	-.233**	.055	1.000
C2 Order	-.006	.022	.100	.078	-.009	-.003	.408**
C3 Dutifulness	.090	.257**	.358**	.117	.067	.155	.606**
C4 Achievement striving	.087	.104	.177*	.037	.014	-.010	.588**
C5 Self-discipline	.066	.077	.084	-.024	-.104	.029	.597**
C6 Deliberation	.123	.237**	.157	.181*	.052	.019	.448**
Neuroticism	-.370**	-.110	-.143	-.050	.069	-.039	-.353**
Extraversion	.242**	-.034	.341**	-.102	-.207*	.121	.158
Openness	.047	-.072	.318**	.105	.048	.475**	.054
Agreeableness	.544**	.654**	.628**	.679**	.645**	.463**	.081
Agreeableness (A1 standardised)	.253**	.683**	.604**	.619**	.726**	.521**	-.014
Conscientiousness	.109	.161	.213*	.109	-.039	.053	.767**
Age	-.014	-.133	-.092	-.058	-.115	-.066	.081
Gender	-.180*	.051	-.125	-.090	.139	-.049	-.097
Year of study	-.030	-.093	-.053	-.015	-.140	.116	.121
Charity donation	.118	.287**	.271**	.245**	.268**	.187*	-.009
Misunderstood rules	-.095	.037	.101	-.079	.086	-.014	.022
Sender Game 1	-.110	-.006	-.041	.017	-.147	-.055	.047
Betrayal aversion	-.033	-.080	-.135	-.098	-.005	-.033	-.038
Financial insecurity	-.160	.003	.008	-.118	-.041	.064	-.212*
Positive reciprocity	.030	.157	.446**	.019	.222*	.288**	.234**
Negative reciprocity	-.132	-.408**	-.260**	-.564**	-.248**	-.197*	-.086
Willingness to take risks	.134	-.264**	.026	-.173*	-.091	.056	.007
Double showup fee	.018	.017	.179*	.083	.027	.044	.084

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

Table 5C: Correlation coefficients (Spearman's rho)

	C2	C3	C4	C5	C6	N	E
Generalised trust	-.098	-.005	-.076	.012	-.006	-.257**	.223**
Behavioural trust	-.102	-.030	-.080	-.224**	-.116	-.017	-.060
Behavioural trustworthiness	-.094	.034	-.057	-.113	-.060	-.097	.003
N1 Anxiety	-.046	.030	-.067	-.164	.140	.662**	-.232**
N2 Angry hostility	-.056	-.174*	.017	-.084	-.162	.513**	-.064
N3 Depression	-.210*	-.171*	-.205*	-.441**	-.079	.722**	-.249**
N4 Self-consciousness	-.140	-.088	-.217*	-.344**	.036	.741**	-.409**
N5 Impulsiveness	-.185*	-.103	-.030	-.175*	-.312**	.464**	.186*
N6 Vulnerability	-.233**	-.213*	-.325**	-.347**	-.066	.610**	-.305**
E1 Warmth	.011	.264**	.202*	.205*	.037	-.174*	.660**
E2 Gregariousness	.026	-.019	.029	.168*	-.129	-.125	.653**
E3 Assertiveness	.115	.119	.345**	.352**	-.032	-.188*	.489**
E4 Activity	.270**	.277**	.505**	.433**	-.058	-.274**	.625**
E5 Excitement-seeking	-.049	-.049	.086	-.035	-.308**	-.157	.560**
E6 Positive emotions	.039	.211*	.234**	.204*	-.044	-.359**	.711**
O1 Fantasy	-.103	.022	-.086	-.140	-.249**	.083	.296*
O2 Aesthetics	-.155	.027	-.032	-.089	-.199*	.157	.202*
O3 Feelings	-.180*	.113	.026	-.070	-.002	.123	.366**
O4 Actions	-.174*	-.171*	.034	-.062	-.250**	-.223**	.386**
O5 Ideas	-.019	.219**	.099	-.061	-.007	-.020	.098
O6 Values	-.054	.073	-.013	-.075	-.052	-.037	.087
A1 Trust	-.006	.090	.087	.066	.123	-.370**	.242**
A2 Straightforwardness	.022	.257**	.104	.077	.237**	-.110	-.034
A3 Altruism	.100	.358**	.177*	.084	.157	-.143	.341**
A4 Compliance	.078	.117	.037	-.024	.181*	-.050	-.102
A5 Modesty	-.009	.067	.014	-.104	.052	.069	-.207*
A6 Tender-mindedness	-.003	.155	-.010	.029	.019	-.039	.121
C1 Competence	.408**	.606**	.588**	.597**	.448**	-.353**	.158
C2 Order	1.000	.446**	.484**	.507**	.213*	-.163	.091
C3 Dutifulness	.446**	1.000	.563**	.567**	.464**	-.160	.134
C4 Achievement striving	.484**	.563**	1.000	.661**	.321**	-.147	.300**
C5 Self-discipline	.507**	.567**	.661**	1.000	.331**	-.341**	.256**
C6 Deliberation	.213*	.464**	.321**	.331**	1.000	-.078	-.189*
Neuroticism	-.163	-.160	-.147	-.341**	-.078	1.000	-.271**
Extraversion	.091	.134	.300**	.256**	-.189*	-.271**	1.000
Openness	-.147	.034	-.019	-.117	-.218**	.038	.315**
Agreeableness	.076	.272**	.150	.082	.232**	-.152	.057
Agreeableness (A1 standardised)	.041	.242**	.122	.024	.191*	-.078	.003
Conscientiousness	.661**	.740**	.770**	.791**	.580**	-.282**	.131
Age	-.047	.026	.021	.017	-.136	.009	.016
Gender	-.050	-.042	.127	.035	-.030	.022	.028
Year of study	-.039	.100	.089	.091	-.045	.037	.033
Charity donation	-.048	.037	-.072	-.122	.084	.035	-.054
Misunderstood rules	.048	.149	.118	.053	.128	.129	.051
Sender Game 1	-.020	-.058	-.014	.058	.020	.061	-.045
Betrayal aversion	-.142	-.048	-.156	-.049	.073	-.002	-.073
Financial insecurity	-.322**	-.216*	-.107	-.211*	-.079	.287**	.040
Positive reciprocity	.176*	.365**	.284**	.224**	.147	-.134	.191*
Negative reciprocity	-.103	-.128	-.138	-.041	-.198*	.032	.112
Willingness to take risks	-.054	-.059	.036	-.079	-.321**	-.215*	.274**
Double showup fee	-.055	.113	.038	-.089	-.098	-.070	.076

**Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 5C: Correlation coefficients (Spearman's rho)

	O	A	A (A1 S)	C	Age	Gender	Year of study
Generalised trust	.106	.313**	.089	-.047	-.096	-.114	-.090
Behavioural trust	.249**	.139	.159	-.106	-.022	-.045	-.162
Behavioural trustworthiness	.143	.239**	.287**	-.074	.133	.170*	-.084
N1 Anxiety	-.076	.153	.168*	-.108	-.056	-.036	.002
N2 Angry hostility	-.071	-.493**	-.385**	-.113	.112	.204*	.136
N3 Depression	.167*	.051	.128	-.329**	-.008	.006	.045
N4 Self-consciousness	-.020	.006	.065	-.219**	.014	-.064	.081
N5 Impulsiveness	.260**	-.256**	-.168*	-.252**	.133	.218**	.126
N6 Vulnerability	-.109	-.061	.040	-.339**	.006	.103	-.011
E1 Warmth	.290**	.347**	.250**	.150	-.080	-.142	-.038
E2 Gregariousness	.098	.007	-.042	.006	-.038	-.067	.020
E3 Assertiveness	.065	-.270**	-.213*	.249**	.157	.245**	.077
E4 Activity	.137	-.025	-.030	.325**	.033	.112	.078
E5 Excitement-seeking	.332**	-.068	-.069	-.129	.040	.074	.063
E6 Positive emotions	.310**	.268**	.174*	.161	-.041	-.055	.002
O1 Fantasy	.572**	.099	.109	-.185*	.022	-.002	.085
O2 Aesthetics	.741**	.261**	.262**	-.052	.025	.040	.008
O3 Feelings	.609**	.024	.064	.001	.092	.028	.115
O4 Actions	.488**	.207*	.105	-.166	.053	-.028	.114
O5 Ideas	.651**	.090	.154	.084	-.027	.095	-.009
O6 Values	.400**	.238**	.241**	-.025	.003	-.077	-.076
A1 Trust	.047	.544**	.253**	.109	-.014	-.180*	-.030
A2 Straightforwardness	-.072	.654**	.683**	.161	-.133	.051	-.093
A3 Altruism	.318**	.628**	.604**	.213*	-.092	-.125	-.053
A4 Compliance	.105	.679**	.619**	.109	-.058	-.090	-.015
A5 Modesty	.048	.645**	.726**	-.039	-.115	.139	-.140
A6 Tender-mindedness	.475**	.463**	.521**	.053	-.066	-.049	.116
C1 Competence	.054	.081	-.014	.767**	.081	-.097	.121
C2 Order	-.147	.076	.041	.661**	-.047	-.050	-.039
C3 Dutifulness	.034	.272**	.242**	.740**	.026	-.042	.100
C4 Achievement striving	-.019	.150	.122	.770**	.021	.127	.089
C5 Self-discipline	-.117	.082	.024	.791**	.017	.035	.091
C6 Deliberation	-.218**	.232**	.191*	.580**	-.136	-.030	-.045
Neuroticism	.038	-.152	-.078	-.282**	.009	.022	.037
Extraversion	.315**	.057	.003	.131	.016	.028	.033
Openness	1.000	.180*	.212*	-.082	.062	.012	.096
Agreeableness	.180*	1.000	.866**	.191*	-.121	-.059	-.063
Agreeableness (A1 standardised)	.212*	.866**	1.000	.142	-.112	.257**	-.061
Conscientiousness	-.082	.191*	.142	1.000	-.027	.002	.022
Age	.062	-.121	-.112	-.027	1.000	.079	.691**
Gender	.012	-.059	.257**	.002	.079	1.000	.035
Year of study	.096	-.063	-.061	.022	.691**	.035	1.000
Charity donation	.140	.318**	.379**	-.024	-.119	.143	-.144
Misunderstood rules	-.005	.019	.083	.094	.000	.157	.064
Sender Game 1	.068	-.133	-.121	.016	-.027	-.142	-.005
Betrayal aversion	-.024	-.130	-.126	-.061	-.053	-.110	-.008
Financial insecurity	.148	-.106	-.003	-.227**	.075	.090	.116
Positive reciprocity	.220**	.255**	.342**	.285**	-.024	.118	-.051
Negative reciprocity	-.138	-.476**	-.519**	-.166	-.096	-.192*	-.113
Willingness to take risks	.306**	-.071	-.166	-.130	.100	-.073	.049
Double showup fee	.150	.086	.110	.034	.062	.081	.011

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

^a N = 140; otherwise, N = 170

Table 5C: Correlation coefficients (Spearman's rho)

	Charity donat.	Misund. Rules	Sender Game 1	Betrayal avers.	Financial insec.
Generalised trust	-.013	-.163	-.083	.012	-.156
Behavioural trust	.193*	-.072	.217*	-.181*	.066
Behavioural trustworthiness	.239**	-.261**	-.051	-.115	-.109
N1 Anxiety	.156	.135	.058	-.038	.149
N2 Angry hostility	-.094	.044	.000	.009	.238**
N3 Depression	.083	.081	.062	-.018	.235**
N4 Self-consciousness	.091	.161	.145	.043	.235**
N5 Impulsiveness	-.106	.159	-.036	-.028	.247**
N6 Vulnerability	.000	.089	-.055	-.069	.280**
E1 Warmth	.086	.119	.010	.018	-.029
E2 Gregariousness	-.087	-.020	.045	-.063	-.046
E3 Assertiveness	-.121	-.006	.001	-.082	.009
E4 Activity	-.090	.061	.044	-.128	-.012
E5 Excitement-seeking	-.022	-.013	-.029	-.022	.095
E6 Positive emotions	-.023	-.021	-.067	.005	-.048
O1 Fantasy	.064	.043	-.074	-.065	.064
O2 Aesthetics	.182*	-.054	.052	-.116	.124
O3 Feelings	.107	.084	.014	.075	.203*
O4 Actions	-.015	-.263**	.033	-.131	.041
O5 Ideas	.022	.012	.059	.061	-.035
O6 Values	.179*	.044	-.033	.083	-.074
A1 Trust	.118	-.095	-.110	-.033	-.160
A2 Straightforwardness	.287**	.037	-.006	-.080	.003
A3 Altruism	.271**	.101	-.041	-.135	.008
A4 Compliance	.245**	-.079	.017	-.098	-.118
A5 Modesty	.268**	.086	-.147	-.005	-.041
A6 Tender-mindedness	.187*	-.014	-.055	-.033	.064
C1 Competence	-.009	.022	.047	-.038	-.212*
C2 Order	-.048	.048	-.020	-.142	-.322**
C3 Dutifulness	.037	.149	-.058	-.048	-.216*
C4 Achievement striving	-.072	.118	-.014	-.156	-.107
C5 Self-discipline	-.122	.053	.058	-.049	-.211*
C6 Deliberation	.084	.128	.020	.073	-.079
Neuroticism	.035	.129	.061	-.002	.287**
Extraversion	-.054	.051	-.045	-.073	.040
Openness	.140	-.005	.068	-.024	.148
Agreeableness	.318**	.019	-.133	-.130	-.106
Agreeableness (A1 standardised)	.379**	.083	-.121	-.126	-.003
Conscientiousness	-.024	.094	.016	-.061	-.227**
Age	-.119	.000	-.027	-.053	.075
Gender	.143	.157	-.142	-.110	.090
Year of study	-.144	.064	-.005	-.008	.116
Charity donation	1.000	.095	.002	-.025	-.101
Misunderstood rules	.095	1.000	.057	.096	.118
Sender Game 1	.002	.057	1.000	-.136	.053
Betrayal aversion	-.025	.096	-.136	1.000	.025
Financial insecurity	-.101	.118	.053	.025	1.000
Positive reciprocity	.221*	.100	-.032	-.105	.005
Negative reciprocity	-.168*	.086	.041	.075	.107
Willingness to take risks	-.007	-.198*	-.070	-.015	-.038
Double showup fee	.186*	.085	-.019	.082	-.018

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 5C: Correlation coefficients (Spearman's rho)

	Positive recipr.	Negative recipr.	Willing to take risks	Double showup fee
Generalised trust	-.065	-.024	.146	.092
Behavioural trust	.064	-.036	.109	.079
Behavioural trustworthiness	.181*	-.114	.059	.106
N1 Anxiety	-.002	-.043	-.325**	-.026
N2 Angry hostility	-.171*	.376**	-.099	-.109
N3 Depression	-.044	-.107	-.050	-.002
N4 Self-consciousness	-.176*	-.080	-.381**	-.034
N5 Impulsiveness	.015	.143	-.025	-.016
N6 Vulnerability	-.143	-.006	-.270**	-.062
E1 Warmth	.264**	-.004	.105	.154
E2 Gregariousness	.047	.087	.110	-.003
E3 Assertiveness	.157	.158	.107	.059
E4 Activity	.172*	.050	.193*	.052
E5 Excitement-seeking	.138	.140	.386**	.073
E6 Positive emotions	.250**	-.036	.220**	.143
O1 Fantasy	.155	.029	.230**	.091
O2 Aesthetics	.229**	-.130	.228**	.098
O3 Feelings	.222**	-.002	.140	.190*
O4 Actions	-.052	-.068	.456**	.055
O5 Ideas	.195*	-.153	.234**	.180*
O6 Values	.090	-.077	-.031	.148
A1 Trust	.030	-.132	.134	.018
A2 Straightforwardness	.157	-.408**	-.264**	.017
A3 Altruism	.446**	-.260**	.026	.179*
A4 Compliance	.019	-.564**	-.173*	.083
A5 Modesty	.222**	-.248**	-.091	.027
A6 Tender-mindedness	.288**	-.197*	.056	.044
C1 Competence	.234**	-.086	.007	.084
C2 Order	.176*	-.103	-.054	-.055
C3 Dutifulness	.365**	-.128	-.059	.113
C4 Achievement striving	.284**	-.138	.036	.038
C5 Self-discipline	.224**	-.041	-.079	-.089
C6 Deliberation	.147	-.198*	-.321**	-.098
Neuroticism	-.134	.032	-.215*	-.070
Extraversion	.191*	.112	.274**	.076
Openness	.220**	-.138	.306**	.150
Agreeableness	.255**	-.476**	-.071	.086
Agreeableness (A1 standardised)	.342**	-.519**	-.166	.110
Conscientiousness	.285**	-.166	-.130	.034
Age	-.024	-.096	.100	.062
Gender	.118	-.192*	-.073	.081
Year of study	-.051	-.113	.049	.011
Charity donation	.221**	-.168*	-.007	.186*
Misunderstood rules	.100	.086	-.198*	.085
Sender Game 1	-.032	.041	-.070	-.019
Betrayal aversion	-.105	.075	-.015	.082
Financial insecurity	.005	.107	-.038	-.018
Positive reciprocity	1.000	-.111	.160	.144
Negative reciprocity	-.111	1.000	.130	.053
Willingness to take risks	.160	.130	1.000	.066
Double showup fee	.144	.053	.066	1.000

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Appendix 5D

Table 5.5: Coefficients for NEO-PI-3 variables when predicting self-reported GTQ score (unstandardised coefficients (SE), *effect size r*)

	N170		N122	
	With demog.	No demog.	With demog.	No demog.
Neuroticism	-.43 (.16) .21	-.45 (.16) .22	-.54 (.22) .25	-.51 (.22) .23
Extraversion	.25 (.15) .13	.23 (.15)	.06 (.19)	.07 (.19)
Openness	-.07 (.17)	-.05 (.16)	.04 (.20)	.05 (.19)
Agreeableness	.63 (.14) .35	.63 (.13) .35	.46 (.20) .23	.47 (.19) .23
Conscientiousness	<u>-.29</u> (.15) .15	-.32 (.15) .17	-.29 (.18)	-.31 (.17)
N1 Anxiety	-.32 (.16) .16	-.34 (.15) .17	-.25 (.21)	-.21 (.20)
N2 Angry hostility	-.18 (.16)	-.17 (.15)	-.20 (.19)	-.22 (.18)
N3 Depression	-.59 (.18) .27	-.61 (.17) .28	-.73 (.23) .34	-.73 (.22) .34
N4 Self-consciousness	-.19 (.16)	-.20 (.16)	-.16 (.21)	-.14 (.20)
N5 Impulsiveness	<u>-.34</u> (.18) .16	-.36 (.17) .17	-.52 (.23) .23	-.58 (.23) .25
N6 Vulnerability	-.49 (.17) .24	-.50 (.16) .24	-.62 (.21) .29	-.62 (.21) .29
E1 Warmth	.19 (.16)	.18 (.15)	-.05 (.20)	.02 (.19)
E2 Gregariousness	.13 (.13)	.12 (.13)	.09 (.16)	.10 (.16)
E3 Assertiveness	.23 (.16)	.19 (.15)	.17 (.20)	.07 (.19)
E4 Activity	.07 (.15)	.06 (.15)	-.09 (.19)	-.09 (.19)
E5 Excitement-seeking	.04 (.16)	.03 (.16)	-.04 (.21)	-.10 (.21)
E6 Positive emotions	.32 (.15) .18	.34 (.14) .19	.15 (.19)	.21 (.18)
O1 Fantasy	-.25 (.15)	-.24 (.15)	-.16 (.19)	-.18 (.18)
O2 Aesthetics	.03 (.14)	.04 (.14)	.12 (.16)	.12 (.16)
O3 Feelings	.03 (.14)	.01 (.14)	.20 (.17)	.16 (.17)
O4 Actions	-.03 (.15)	-.01 (.14)	-.18 (.18)	-.14 (.17)
O5 Ideas	.04 (.16)	.05 (.15)	.17 (.19)	.13 (.19)
O6 Values	.02 (.18)	.06 (.17)	.12 (.22)	.17 (.21)
A1 Trust	1.12 (.12) .63	1.11 (.11) .63	1.16 (.15) .59	1.17 (.15) .59
A2 Straightforwardness	.26 (.15)	.23 (.15)	.21 (.18)	.17 (.18)
A3 Altruism	.40 (.18) .18	.39 (.18) .18	.47 (.23) .20	.49 (.23) .21
A4 Compliance	.27 (.14) .16	.25 (.13)	.09 (.16)	.10 (.16)
A5 Modesty	.21 (.15)	.19 (.14)	-.02 (.17)	-.04 (.17)
A6 Tender-mindedness	.39 (.16) .21	.35 (.16) .19	.13 (.20)	.18 (.19)
C1 Competence	-.09 (.17)	-.10 (.17)	-.04 (.21)	-.03 (.20)
C2 Order	-.37 (.13) .20	-.38 (.13) .21	<u>-.30</u> (.16)	-.32 (.16) .18
C3 Dutifulness	-.21 (.16)	-.25 (.16)	-.13 (.19)	-.16 (.19)
C4 Achievement striving	-.27 (.13) .16	-.28 (.13) .17	-.36 (.15) .22	-.40 (.15) .25
C5 Self-discipline	-.10 (.16)	-.16 (.15)	-.13 (.20)	-.19 (.19)
C6 Deliberation	-.10 (.16)	-.13 (.16)	.01 (.19)	-.03 (.19)

Bold font indicates coefficient significant at $p \leq .05$; underlined coefficient indicates borderline significance ($.05 < p \leq .06$).

Demographic variables included were age, gender and year of education: these were all non-significant in every model except for N122, where gender was borderline significant ($p = .057$).

N170: total questionnaire sample; model uses the full Agreeableness trait, with facet A1 (*trust*) intact.

N122: subsample of N170; model uses the adjusted Agreeableness trait, with facet A1 (*trust*) standardised to its mean and thereby excluded from these analyses.

Trait coefficients (Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness): association with GTQ when traits are the only personality variables in the model (i.e. no individual facets included).

Facets: coefficient indicates association with GTQ when this facet replaces its parent trait in the model (e.g. the coefficient for N1 [Anxiety] indicates the association between N1 and GTQ when N1 replaces Neuroticism in the model alongside Extraversion, Openness, Agreeableness and Conscientiousness).

Appendix 5E

Table 5E: Regression coefficients for behavioural trustworthiness (odds ratio (standard error) *effect size*)

	N140		N122	
	With demog.	No demog.	With demog.	No demog.
Neuroticism	.72 (.24)	.75 (.21)	.80 (.54)	.83 (.23)
Extraversion	.84 (.22)	.85 (.20)	.89 (.24)	.97 (.22)
Openness	1.33 (.23)	1.27 (.21)	1.29 (.25)	1.21 (.23)
Agreeableness	1.91 (.20) .18	1.63 (.18) .13	1.91 (.22) .18	1.62 (.19) .13
Conscientiousness	.75 (.21)	.76 (.19)	.83 (.23)	.76 (.20)
N1 Anxiety	.91 (.22)	.85 (.20)	1.00 (.24)	.92 (.22)
N2 Angry hostility	.93 (.23)	1.00 (.19)	1.04 (.24)	1.12 (.21)
N3 Depression	.82 (.26)	.82 (.24)	.76 (.30)	.77 (.27)
N4 Self-consciousness	.77 (.23)	.72 (.22)	.87 (.26)	.80 (.24)
N5 Impulsiveness	.53 (.27) .17	.71 (.23)	.68 (.30)	.82 (.26)
N6 Vulnerability	.72 (.23)	.80 (.20)	.75 (.24)	.86 (.21)
E1 Warmth	.98 (.22)	.77 (.21)	1.17 (.24)	1.05 (.22)
E2 Gregariousness	.68 (.19) .11	.73 (.21)	.62 (.22) .13	.61 (.20) .14
E3 Assertiveness	1.24 (.23)	.84 (.21)	1.17 (.25)	1.34 (.22)
E4 Activity	.97 (.22)	.79 (.21)	1.14 (.25)	1.20 (.22)
E5 Excitement-seeking	.87 (.23)	.90 (.21)	.84 (.26)	.99 (.24)
E6 Positive emotions	.73 (.22)	.77 (.19)	.79 (.24)	.86 (.21)
O1 Fantasy	1.27 (.23)	1.16 (.21)	1.29 (.24)	1.13 (.21)
O2 Aesthetics	1.28 (.19)	1.29 (.18)	1.18 (.21)	1.24 (.19)
O3 Feelings	1.30 (.21)	1.22 (.19)	1.34 (.24)	1.29 (.21)
O4 Actions	1.19 (.22)	1.11 (.20)	.97 (.25)	.92 (.23)
O5 Ideas	1.19 (.21)	1.17 (.20)	1.16 (.24)	1.08 (.22)
O6 Values	.75 (.27)	.90 (.23)	.74 (.30)	.84 (.25)
A1 Trust	1.75 (.21) .15	1.53 (.18) .12	1.68 (.22) .14	1.47 (.19) .11
A2 Straightforwardness	1.63 (.21) .13	1.50 (.19) .11	1.93 (.25) .18	1.81 (.23) .16
A3 Altruism	2.01 (.26) .19	<u>1.55</u> (.23) .12	2.02 (.29) .19	1.56 (.25)
A4 Compliance	1.66 (.19) .14	1.46 (.17) .10	1.47 (.20) .11	1.32 (.17)
A5 Modesty	1.32 (.19)	1.37 (.17)	<u>1.46</u> (.20) .10	1.49 (.18) .11
A6 Tender-mindedness	1.50 (.22)	1.17 (.20)	1.50 (.24)	1.08 (.21)
C1 Competence	.98 (.23)	.87 (.21)	1.11 (.26)	.91 (.23)
C2 Order	.81 (.19)	.81 (.17)	.82 (.21)	.79 (.19)
C3 Dutifulness	1.01 (.23)	.95 (.21)	1.22 (.26)	1.00 (.23)
C4 Achievement striving	.86 (.18)	.89 (.16)	.92 (.21)	.92 (.18)
C5 Self-discipline	.70 (.22)	.70 (.20)	.77 (.24)	.72 (.22)
C6 Deliberation	.84 (.23)	.80 (.21)	.95 (.25)	.82 (.22)

Bold font indicates coefficient significant at $p \leq .05$; underlined coefficient indicates borderline significance ($.05 < p \leq .06$).

N140: total sample of participants who completed the questionnaire and the trust game; model uses the full Agreeableness trait, with facet A1 (*trust*) intact.

N112: excludes those participants (from N140) who had misunderstood the rules of the trust game.

Demographic variables included were age, gender and year of education.

Trait coefficients: association with GTQ when traits are the only personality variables in the model (i.e. no individual facets included).

Facet coefficients: association with GTQ when this facet replaces its parent trait in the model (e.g. the coefficient for N1 [Anxiety] indicates the association between N1 and GTQ when N1 replaces Neuroticism in the model alongside Extraversion, Openness, Agreeableness and Conscientiousness).

Appendix 5F

Table 5F: Regression coefficients controlling for financial insecurity

	Self-reported trust		Behavioural trust OR (SE) r	Behavioural trustworthiness OR (SE) r
	B (SE) r			
	N140	N122		
Neuroticism		-.48 (.22) .22		
Extraversion	.39 (.17) .20		.64 (.22) .12	
Openness			2.10 (.24) .20	
Agreeableness	.53 (.15) .29	.42 (.20) .21		1.86 (.21) .17
Conscientiousness	-.32 (.16) -.17	-.36 (.18) -.20		
N1 Anxiety				
N2 Angry hostility				
N3 Depression	-.57 (.21) -.25	-.71 (.23) -.33		
N4 Self-consciousness				
N5 Impulsiveness		-.50 (.24) -.22		.57 (.28) .15
N6 Vulnerability		-.55 (.22) -.26	.51 (.27) .18	
E1 Warmth				
E2 Gregariousness				.65 (.19) .12
E3 Assertiveness				
E4 Activity				
E5 Excitement-seeking				
E6 Positive emotions	.40 (.17) .23			
O1 Fantasy				
O2 Aesthetics			1.76 (.19) .15	
O3 Feelings			1.76 (.21) .15	
O4 Actions				
O5 Ideas			1.65 (.21) .14	
O6 Values				
A1 Trust	1.24 (.13) .67	1.14 (.16) .57		1.77 (.22) .16
A2 Straightforwardness				1.70 (.21) .14
A3 Altruism		.45 (.23) .19		1.98 (.26) .19
A4 Compliance				1.61 (.19) .13
A5 Modesty				
A6 Tender-mindedness	.36 (.19) .19			1.56 (.22) .12
C1 Competence				
C2 Order	-.40 (.15) -.23	-.39 (.17) -.23		
C3 Dutifulness				
C4 Achievement striving	-.32 (.15) -.19	-.42 (.15) -.26		
C5 Self-discipline			.59 (.22) .14	
C6 Deliberation				

Bold font indicates coefficient significant at $p \leq .05$; underlined coefficient indicates borderline significance ($.05 < p \leq .06$).

N140: total sample of participants who completed the questionnaire and the trust game; model uses the full Agreeableness trait, with facet A1 (*trust*) intact.

N112: excludes those participants (from N140) who had misunderstood the rules of the trust game.

All models included age, gender, year of education and financial insecurity. The models for behavioural trust also controlled for order of play.

Trait coefficients: association with GTQ when traits are the only personality variables in the model (i.e. no individual facets included).

Facet coefficients: association with GTQ when this facet replaces its parent trait in the model (e.g. the coefficient for N1 [Anxiety] indicates the association between N1 and GTQ when N1 replaces Neuroticism in the model alongside Extraversion, Openness, Agreeableness and Conscientiousness).

References

- Adelstein, J. S., Shehzad, Z., Mennes, M., DeYoung, C. G., Zuo, X.-N., Kelly, C., . . . Castellanos, F. X. (2011). Personality is reflected in the brain's intrinsic functional architecture. *PloS one*, 6(11), e27633-e27633.
- Aghajani, M., Veer, I. M., van Tol, M.-J., Aleman, A., van Buchem, M. A., Veltman, D. J., . . . van der Wee, N. J. (2014). Neuroticism and extraversion are associated with amygdala resting-state functional connectivity. *Cognitive, Affective, & Behavioral Neuroscience*, 14(2), 836-848.
- Ahmed, A. M., & Salas, O. (2009). The relationship between behavioral and attitudinal trust: a cross-cultural study. *Review of social economy*, 67(4), 457-482.
- Albanese, G., De Blasio, G., & Sestito, P. (2013). Trust and preferences: evidence from survey data. *Bank of Italy Temi di Discussione (Working Paper) No, 911*.
- Allin, P. (2007). Measuring societal wellbeing. *Economic & Labour Market Review*, 1(10), 46-52.
- Allport, G. W. (1961). *Pattern and Growth in Personality*. London: Holt, Rinehart and Winston, Inc.
- Allum, N., Patulny, R., Read, S., & Sturgis, P. (2010). Re-evaluating the links between social trust, institutional trust and civic association. In J. Stillwell, P. Norman, C. Thomas & P. Surridge (Eds.), *Spatial and Social Disparities* (pp. 199-215). London: Springer
- Allum, N., Read, S., Sturgis, P., Davidov, E., Schmidt, P., & Billet, J. (2011). Evaluating change in social and political trust in Europe. In E. Davidov, P. Schmidt & J. Billiet (Eds.), *Cross-Cultural Analysis: Methods and Applications* (pp. 35-53). Hove: Routledge.
- Augustine, A. A., Larsen, R. J., & Lee, H. (2013). Affective Personality Traits and Cognition. In M. D. Robinson, E. R. Watkins & E. Harmon-Jones (Eds.), *Handbook of Cognition and Emotion*. New York, NY: The Guilford Press.
- Becker, A., Deckers, T., Dohmen, T. J., Falk, A., & Kosse, F. (2012). The relationship between economic preferences and psychological personality measures *CESifo working paper: Behavioural Economics, No. 3785*.
- Berggren, N., & Jordahl, H. (2006). Free to trust: Economic freedom and social capital. *Kyklos*, 59(2), 141-169.
- Bidner, C., & Francois, P. (2011). Cultivating Trust: Norms, Institutions and the Implications of Scale*. *The Economic Journal*, 121(555), 1097-1129.
- Bilsky, W., Janik, M., & Schwartz, S. H. (2010). The structural organization of human values: Evidence from three rounds of the European Social Survey (ESS). *Journal of Cross-Cultural Psychology*, 42(5), 759-776.
- Bjørnskov, C. (2007). Determinants of generalized trust: A cross-country comparison. *Public choice*, 130(1-2), 1-21.
- Bjørnskov, C. (2008). Social trust and fractionalization: A possible reinterpretation. *European Sociological Review*, 24(3), 271-283.
- Boer, D., & Fischer, R. (2013). How and when do personal values guide our attitudes and sociality? Explaining cross-cultural variability in attitude-value linkages. *Psychological bulletin*, 139(5), 1113-1147.
- Boer, D. P., Starkey, N. J., & Hodgetts, A. M. (2008). The California Psychological Inventory – 434- and 260-item Editions. In G. J. Boyle, G. Matthews & D. H. Saklofske (Eds.), *The SAGE Handbook of Personality Theory and Assessment: Personality Measurement and Testing* (Vol. 2, pp. 97-113). London: SAGE Publications Ltd.
- Bohnet, I., Greig, F., Herrmann, B., & Zeckhauser, R. (2008). Betrayal aversion: Evidence from Brazil, China, Oman, Switzerland, Turkey, and the United States. *The American Economic Review*, 98(1), 294-310.
- Boix, C., & Posner, D. N. (1998). Social capital: Explaining its origins and effects on government performance. *British journal of political science*, 28(4), 686-693.

- Bouckaert, G., & Van de Walle, S. (2003). Comparing measures of citizen trust and user satisfaction as indicators of 'good governance': difficulties in linking trust and satisfaction indicators. *International Review of Administrative Sciences*, 69(3), 329-343.
- Bouckaert, G., Van de Walle, S., Maddens, B., & Kampen, J. K. (2002). Identity vs Performance: An overview of theories explaining trust in government. *Public Management Institute, Katholieke Universiteit Leuven*.
- Boyce, C. J., Wood, A. M., & Powdthavee, N. (2013). Is personality fixed? Personality changes as much as "variable" economic factors and more strongly predicts changes to life satisfaction. *Social Indicators Research*, 111(1), 287-305.
- Boyle, G. J., Matthews, G., & Saklofske, D. H. (2008). Personality theories and models: an overview. In G. J. Boyle, G. Matthews & D. H. Saklofske (Eds.), *The SAGE handbook of personality theory and assessment: personality measurement and testing* (Vol. 1, pp. 1-31). London: SAGE Publications Ltd.
- Brehm, J., & Rahn, W. (1997). Individual-level evidence for the causes and consequences of social capital. *American journal of political science*, 41(3), 999-1023.
- Brehm, S., Kassir, S., & Fein, S. (1999). *Social Psychology*. New York: Houghton Mifflin Company.
- Brown, T. A. (2006). *Confirmatory Factor Analysis for Applied Research*. London: The Guilford Press.
- Burks, S. V., Carpenter, J. P., & Verhoogen, E. (2003). Playing both roles in the trust game. *Journal of Economic Behavior & Organization*, 51(2), 195-216.
- Butler, J., Giuliano, P., & Guiso, L. (2012). Trust, values and false consensus *Discussion Paper Series, Forschungsinstitut zur Zukunft der Arbeit, No. 6916*: National Bureau of Economic Research.
- Byrne, B. M. (2012). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. London: Routledge.
- Canache, D., Mondak, J. J., & Seligson, M. A. (2001). Meaning and measurement in cross-national research on satisfaction with democracy. *Public Opinion Quarterly*, 65(4), 506-528.
- Canli, T. (2006). *Biology of personality and individual differences*. New York: The Guilford Press.
- Canli, T., Zhao, Z., Desmond, J. E., Kang, E., Gross, J., & Gabrieli, J. D. (2001). An fMRI study of personality influences on brain reactivity to emotional stimuli. *Behavioral neuroscience*, 115(1), 33-42.
- Caprara, G. V., Alessandri, G., & Eisenberg, N. (2012). Prosociality: the contribution of traits, values, and self-efficacy beliefs. *Journal of personality and social psychology*, 102(6), 1289-1303.
- Carver, C. S. (2004). Negative affects deriving from the behavioral approach system. *Emotion*, 4(1), 3-22.
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: the BIS/BAS scales. *Journal of personality and social psychology*, 67(2), 319-333.
- Cattell, H. E., & Mead, A. D. (2008). The sixteen personality factor questionnaire (16PF). In G. J. Boyle, G. Matthews & D. H. Saklofske (Eds.), *The SAGE handbook of personality theory and assessment: personality and testing* (Vol. 2, pp. 135-178). London: SAGE Publications Ltd.
- Chen, C., Lee, S.-Y., & Stevenson, H. W. (1995). Response style and cross-cultural comparisons of rating scales among East Asian and North American students. *Psychological Science*, 6(3), 170-175.

- Christensen, T., & Læg Reid, P. (2005). Trust in government: The relative importance of service satisfaction, political factors, and demography. *Public Performance & Management Review*, 28(4), 487-511.
- Chuah, S.-H. (2010). Do Human Values Explain Economic Behavior? An Experimental Study *ICBBR Working Paper Series (No. 2010-01)*: Nottingham University Business School
- Citizen, G. (2007). Retrieved 2 September 2012, from <http://www.globalcitizen.net/intro/?page=1953>
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155-159.
- Cohen, M. X., Young, J., Baek, J.-M., Kessler, C., & Ranganath, C. (2005). Individual differences in extraversion and dopamine genetics predict neural reward responses. *Cognitive Brain Research*, 25(3), 851-861.
- Comrey, A. L. (2008). The Comrey personality scales. In G. J. Boyle, G. Matthews & D. H. Saklofske (Eds.), *Sage handbook of personality theory and testing: personality measurement and assessment* (Vol. 2, pp. 113-134). London: SAGE Publications Ltd.
- Coromina, L., & Davidov, E. (2013). Evaluating Measurement Invariance for Social and Political Trust in Western Europe over Four Measurement Time Points (2002-2008). *ASK. Research&Methods*(22), 37-54.
- Corr, P. J. (2004). Reinforcement sensitivity theory and personality. *Neuroscience & Biobehavioral Reviews*, 28(3), 317-332.
- Corr, P. J. (2008). Reinforcement Sensitivity Theory (RST): Introduction. In P. J. Corr (Ed.), *The reinforcement sensitivity theory of personality*. Cambridge: Cambridge University Press.
- Davidov, E. (2008). A cross-country and cross-time comparison of the human values measurements with the second round of the European Social Survey. *Survey Research Methods*, 2(1), 33-46.
- Davidov, E. (2010). Testing for comparability of human values across countries and time with the third round of the European Social Survey. *International Journal of Comparative Sociology*, 51(3), 171-191.
- Davidov, E., Cieciuch, J., Meuleman, B., Schmidt, P., Algesheimer, R., & Hausherr, M. (2015). The Comparability of Measurements of Attitudes toward Immigration in the European Social Survey Exact versus Approximate Measurement Equivalence. *Public Opinion Quarterly*, 79(S1), 244-266.
- Davies, R., Wilkins, C., Harrison, E. K., Sibley, E., & Owen, D. (2011). Quality of life in ethnically diverse neighbourhoods. European Foundation for the Improvement of Living and Working Conditions: Dublin, Ireland: Eurofound.
- Davis, K. L., & Panksepp, J. (2011). The brain's emotional foundations of human personality and the Affective Neuroscience Personality Scales. *Neuroscience & Biobehavioral Reviews*, 35(9), 1946-1958.
- De Raad, B., & Van Oudenhoven, J. P. (2008). Factors of values in the Dutch language and their relationship to factors of personality. *European Journal of Personality*, 22(2), 81-108.
- DeHoog, R. H., Lowery, D., & Lyons, W. E. (1990). Citizen satisfaction with local governance: a test of individual, jurisdictional, and city-specific explanations. *The Journal of Politics*, 52(3), 807-837.
- Delhey, J., & Newton, K. (2003). Who trusts?: The origins of social trust in seven societies. *European Societies*, 5(2), 93-137.
- Delhey, J., & Newton, K. (2005). Predicting cross-national levels of social trust: global pattern or Nordic exceptionalism? *European Sociological Review*, 21(4), 311-327.
- Delhey, J., Newton, K., & Welzel, C. (2011). How general is trust in "most people"? Solving the radius of trust problem. *American sociological review*, 76(5), 786-807.
- Denters, B., Gabriel, O. W., & Torcal, M. (2007). Political confidence in representative democracies. In J. W. van Deth, J. R. Montero & A. Westholm (Eds.), *Citizenship and*

- involvement in European democracies. a comparative analysis* (pp. 66-87). New York: Routledge.
- Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences*, 22(3), 491-517.
- DeYoung, C. G., Hirsh, J. B., Shane, M. S., Papademetris, X., Rajeevan, N., & Gray, J. R. (2010). Testing predictions from personality neuroscience: Brain structure and the Big Five. *Psychological Science*, 21(6), 820-828.
- DeYoung, C. G., Peterson, J. B., & Higgins, D. M. (2002). Higher-order factors of the Big Five predict conformity: Are there neuroses of health? *Personality and individual differences*, 33(4), 533-552.
- DeYoung, C. G., Peterson, J. B., & Higgins, D. M. (2005). Sources of openness/intellect: Cognitive and neuropsychological correlates of the fifth factor of personality. *Journal of personality*, 73(4), 825-858.
- Dimoka, A. (2010). What does the brain tell us about trust and distrust? Evidence from a functional neuroimaging study. *Mis Quarterly*, 34(2), 373-396.
- Dinesen, P. T. (2013). Where you come from or where you live? Examining the cultural and institutional explanation of generalized trust using migration as a natural experiment. *European Sociological Review*, 29(1), 114-128.
- Dinesen, P. T., & Sønderskov, K. M. (2013). *Ethnic diversity and social trust: the role of exposure in the micro-context*. Paper presented at the Ethnic Diversity and Social Capital conference, Berlin, Germany.
- Dohmen, T., Falk, A., Huffman, D., & Sunde, U. (2008). Representative trust and reciprocity: prevalence and determinants. *Economic Inquiry*, 46(1), 84-90.
- Durlak, J. A. (2009). How to select, calculate, and interpret effect sizes. *Journal of Pediatric Psychology*, 34(9), 917-928.
- Easton, D. (1965). *A framework for political analysis*. Englewood Cliffs, NJ: Prentice-Hall
- Easton, D. (1975). A re-assessment of the concept of political support. *British journal of political science*, 5(4), 435-457.
- Elliot, A. J., & Thrash, T. M. (2008). Approach and avoidance temperaments. In G. J. Boyle, G. Matthews & D. H. Saklofske (Eds.), *The SAGE handbook of personality theory and assessment: Personality theories and models* (Vol. 1, pp. 315-334). London: SAGE Publications Ltd.
- Ermisch, J., & Gambetta, D. (2006). People's Trust: the design of a survey-based experiment *ISER Working Paper Series (No. 2006-34)*: Institute for Social and Economic Research (ISER), University of Essex.
- Ermisch, J., & Gambetta, D. (2011). The long shadow of income on trustworthiness *ISER Working Paper Series (No. 2011-08)*: Institute for Social and Economic Research (ISER), University of Essex.
- Ermisch, J., Gambetta, D., Laurie, H., Siedler, T., & Noah Uhrig, S. (2009). Measuring people's trust. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 172(4), 749-769.
- ESS. (2006). Final Source Questionnaire (Round 3, 2006/7) Amendment 03, from http://www.europeansocialsurvey.org/docs/round3/fieldwork/source/ESS3_source_main_questionnaire.pdf
- ESS. (2012). Sampling for the European Social Survey Round VI: principles and requirements. Mannheim, European Social Survey, GESIS.
- ESS. (2014a). ESS-2 2004 Documentation Report. Edition 3.5: Bergen, European Social Survey Data Archive, Norwegian Social Science Data Services.
- ESS. (2014b). ESS-3 2006 Documentation Report. Edition 3.5: Bergen, European Social Survey Data Archive, Norwegian Social Science Data Services.

- ESS. (2014c). ESS-4 2008 Documentation Report. Edition 5.3: Bergen, European Social Survey Data Archive, Norwegian Social Science Data Services.
- ESS. (2014d). ESS-5 2010 Documentation Report. Edition 3.2: Bergen, European Social Survey Data Archive, Norwegian Social Science Data Services.
- ESS. (2014e). ESS-6 2012 Documentation Report. Edition 2.1: Bergen, European Social Survey Data Archive, Norwegian Social Science Data Services.
- . European Social Survey Round 2 Data (2004). Data file edition 3.4. Norwegian Social Science Data Services, Norway – Data Archive and distributor of ESS data.
- . European Social Survey Round 3 Data (2006). Data file edition 3.5. Norwegian Social Science Data Services, Norway – Data Archive and distributor of ESS data.
- . European Social Survey Round 4 Data (2008). Data file edition 3.5. Norwegian Social Science Data Services, Norway - Data Archive and distributor of ESS data.
- . European Social Survey Round 5 Data (2010). Data file edition 3.2. Norwegian Social Science Data Services, Norway - Data Archive and distributor of ESS data.
- Evans, A. M., & Revelle, W. (2008). Survey and behavioral measurements of interpersonal trust. *Journal of Research in Personality*, 42(6), 1585-1593.
- Ewen, R. B. (2010). *An Introduction to Theories of Personality*. London: Psychology Press, Taylor & Francis Group.
- Farrell, G., Thirion, S., Dubois, J., Glatzer, W., Nascimento, I., Redelsperger, C., & Amoroso, B. (2008). Well-being for all: concepts and tools for social cohesion *Trends in Social Cohesion*. Strasbourg CEDEX: Council of Europe Publishing.
- Fehr, E. (2008). *On the economics and biology of trust*. Paper presented at the IZA discussion papers, No. 3895. <http://nbn-resolving.de/urn:nbn:de:101:1-2009010729>
- Fehr, E., Fischbacher, U., Von Rosenblatt, B., Schupp, J., & Wagner, G. G. (2003). A nationwide laboratory examining trust and trustworthiness by integrating behavioural experiments into representative surveys *Working Paper No. 141*. University of Zurich: Institute for Empirical Research in Economics.
- Field, A. (2000). *Discovering statistics using SPSS for Windows: advanced techniques for the beginner*. London: SAGE Publications Ltd.
- Finseraas, H., & Jakobsson, N. (2012). Trust and Ethnic Fractionalization: The Importance of Religion as a Cross-Cutting Dimension. *Kyklos*, 65(3), 327-339.
- Fischbacher, U. (2007). z-Tree: Zurich toolbox for ready-made economic experiments. *Experimental economics*, 10(2), 171-178.
- Forbes, C. E., Poore, J. C., Krueger, F., Barbey, A. K., Solomon, J., & Grafman, J. (2014). The role of executive function and the dorsolateral prefrontal cortex in the expression of neuroticism and conscientiousness. *Social neuroscience*, 9(2), 139-151.
- Forrest, R., & Kearns, A. (2001). Social cohesion, social capital and the neighbourhood. *Urban studies*, 38(12), 2125-2143.
- Freitag, M. (2003). Beyond Tocqueville: The origins of social capital in Switzerland. *European Sociological Review*, 19(2), 217-232.
- Freitag, M., & Bühlmann, M. (2009). Crafting trust the role of political institutions in a comparative perspective. *Comparative Political Studies*, 42(12), 1537-1566.
- Furnham, A., Eysenck S. B. G. & Saklofske, D. H. (2008). The Eysenck personality measures: fifty years of scale development. In G. J. Boyle, G. Matthews & D. H. Saklofske (Eds.), *The SAGE handbook of personality theory and assessment: personality measurement and testing* (Vol. 2, pp. 199-218). London: SAGE Publications Ltd.
- Gardini, S., Cloninger, C. R., & Venneri, A. (2009). Individual differences in personality traits reflect structural variance in specific brain regions. *Brain research bulletin*, 79(5), 265-270.
- Gelissen, J., & de Graaf, P. M. (2006). Personality, social background, and occupational career success. *Social Science Research*, 35(3), 702-726.

- Gerlitz, J.-Y., & Schupp, J. (2005). Zur Erhebung der Big-Five-basierten persönlichkeitsmerkmale im SOEP. *DIW Research Notes*, 4, 2005.
- Glaeser, E. L., Laibson, D. I., Scheinkman, J. A., & Soutter, C. L. (2000). Measuring trust. *Quarterly Journal of Economics*, 115(3), 811-846.
- Glaser, M. A., & Denhardt, R. B. (2000). Local government performance through the eyes of citizens. *Journal of Public Budgeting Accounting and Financial Management*, 12(1), 49-73.
- Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of Personality and Social Psychology*, 101(2), 366-385.
- Graziano, W. G., & Tobin, R. M. (2013). The cognitive and motivational foundations underlying agreeableness. In M. D. Robinson, E. R. Watkins & E. Harmon-Jones (Eds.), *Handbook of cognition and emotion* (pp. 347-364). New York: The Guilford Press.
- Gundelach, B. (2014). In diversity we trust: the positive effect of ethnic diversity on outgroup trust. *Political Behavior*, 36(1), 125-142.
- Haas, B. W., Ishak, A., Denison, L., Anderson, I., & Filkowski, M. M. (2015). Agreeableness and brain activity during emotion attribution decisions. *Journal of Research in Personality*, 57, 26-31.
- Haas, B. W., Omura, K., Constable, R. T., & Canli, T. (2007). Is automatic emotion regulation associated with agreeableness? A perspective using a social neuroscience approach. *Psychological Science*, 18(2), 130-132.
- Hahn, E., Gottschling, J., & Spinath, F. M. (2012). Short measurements of personality—Validity and reliability of the GSOEP Big Five Inventory (BFI-S). *Journal of Research in Personality*, 46(3), 355-359.
- Hahn, T., Dresler, T., Ehli, A.-C., Plichta, M. M., Heinz, S., Polak, T., . . . Fallgatter, A. J. (2009). Neural response to reward anticipation is modulated by Gray's impulsivity. *Neuroimage*, 46(4), 1148-1153.
- Haidt, J., & Graham, J. (2007). When morality opposes justice: Conservatives have moral intuitions that liberals may not recognize. *Social Justice Research*, 20(1), 98-116.
- Hamamura, T. (2011). Social class predicts generalized trust but only in wealthy societies. *Journal of Cross-Cultural Psychology*, 43(3), 498-509.
- Harrison, E., Jowell, R., & Sibley, E. (2011). Developing attitudinal indicators of societal progress. *ASK Research & Methods*, 20(1), 59-80.
- Helliwell, J. F., & Putnam, R. D. (2004). The social context of well-being. *Philosophical transactions-royal society of London series B biological sciences*, 359, 1435-1446.
- Herreros, F. (2012). The state counts: State efficacy and the development of trust. *Rationality and Society*, 24(4), 483-509.
- Herreros, F., & Criado, H. (2008). The state and the development of social trust. *International Political Science Review*, 29(1), 53-71.
- Hetherington, M. J. (1998). The political relevance of political trust. *American Political Science Review*, 92(4), 791-808.
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. London: SAGE Publications Ltd.
- Holm, H., & Nystedt, P. (2008). Trust in surveys and games - a methodological contribution on the influence of money and location. *Journal of Economic Psychology*, 29(4), 522-542.
- Hooghe, M. (2011). Why there is basically only one form of political trust. *The British Journal of Politics & International Relations*, 13(2), 269-275.
- Hooghe, M., Marien, S., & Pauwels, T. (2011). Where do distrusting voters turn if there is no viable exit or voice option? The impact of political trust on electoral behaviour in the Belgian Regional Elections of June 2009. *Government and Opposition*, 46(2), 245-273.

- Hudson, J. (2006). Institutional Trust and Subjective Well-Being across the EU. *Kyklos*, 59(1), 43-62.
- Hundt, N. E., Brown, L. H., Kimbrel, N. A., Walsh, M. A., Nelson-Gray, R., & Kwapil, T. R. (2013). Reinforcement sensitivity theory predicts positive and negative affect in daily life. *Personality and individual differences*, 54(3), 350-354.
- Inglehart, R. (1999). Trust, well-being and democracy. In M. E. Warren (Ed.), *Democracy and trust*. Cambridge: Cambridge University Press.
- Inglehart, R., & Baker, W. E. (2000). Modernization, cultural change, and the persistence of traditional values. *American sociological review*, 65(1), 19-51.
- Jensen-Campbell, L. A., Rosselli, M., Workman, K. A., Santisi, M., Rios, J. D., & Bojan, D. (2002). Agreeableness, conscientiousness, and effortful control processes. *Journal of Research in Personality*, 36(5), 476-489.
- John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: history, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of Personality: Theory and Research* (2nd ed., pp. 102-138). New York: The Guilford Press.
- Johnson, N. D., & Mislin, A. A. (2011). Trust games: A meta-analysis. *Journal of Economic Psychology*, 32(5), 865-889.
- Judge, T. A., Higgins, C. A., Thoresen, C. J., & Barrick, M. R. (1999). The big five personality traits, general mental ability, and career success across the life span. *Personnel psychology*, 52(3), 621-652.
- Kaase, M. (1999). Interpersonal trust, political trust and non-institutionalised political participation in Western Europe. *West European Politics*, 22(3), 1-21.
- Kampen, J. K., De Walle, S. V., & Bouckaert, G. (2006). Assessing the Relation Between Satisfaction with Public Service Delivery and Trust in Government. The Impact of the Predisposition of Citizens Toward Government on Evaluations of Its Performance. *Public Performance & Management Review*, 29(4), 387-404.
- Kaufman, D., Kraay, A., & Mastruzzi, M. (2010). The Worldwide governance indicators: A summary of methodology, data and analytical issues *World Bank Policy Research* (No. 5430): The World Bank.
- Kearns, A., & Forrest, R. (2000). Social cohesion and multilevel urban governance. *Urban Studies*, 37(5/6), 995-1017.
- Killip, D., Mahfoud, Z., & Pearce, K. (2004). What is an intracluster correlation coefficient? Crucial concepts for primary care researchers. *Annals of Family Medicine*, 2(3), 204-208.
- Kim, M. (2009). Cross-National Analyses of Satisfaction with Democracy and Ideological Congruence. *Journal of Elections, Public Opinion and Parties*, 19(1), 49-72.
- Knack, S. (2002). Social capital and the quality of government: evidence from the states. *American Journal of Political Science*, 46(4), 772-785.
- Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *The Quarterly Journal of Economics*, 112(4), 1251-1288.
- Kolstad, I., & Wiig, A. (2012). Testing the pearl hypothesis: Natural resources and trust. *Resources Policy*, 37(3), 358-367.
- Kong, D. T. (2013). Examining a climateconomic contextualization of generalized social trust mediated by uncertainty avoidance. *Journal of Cross-Cultural Psychology*, 44(4), 574-588.
- Kotzian, P. (2011). Conditional trust: The role of individual and system-level features for trust and confidence in institutions. *Zeitschrift für Vergleichende Politikwissenschaft*, 5(1), 25-49.
- Krosnick, J. A., Narayan, S. S., & Smith, W. R. (1996). *Satisficing in surveys: Initial evidence*. San Francisco: Jossey-Bass.

- Kunisato, Y., Okamoto, Y., Okada, G., Aoyama, S., Nishiyama, Y., Onoda, K., & Yamawaki, S. (2011). Personality traits and the amplitude of spontaneous low-frequency oscillations during resting state. *Neuroscience letters*, 492(2), 109-113.
- Lazzarini, S. G., Madalozzo, R., Artes, R., & Siqueira, J. d. O. (2005). Measuring trust: An experiment in Brazil. *Brazilian Journal of Applied Economics*, 9(2), 153-169.
- Lee, C.-S. (2013). Welfare states and social trust. *Comparative Political Studies*, 46(5), 603-630.
- Lee, K., & Ashton, M. C. (2004). Psychometric properties of the HEXACO personality inventory. *Multivariate Behavioral Research*, 39(2), 329-358.
- Levi, M., & Stoker, L. (2000). Political trust and trustworthiness. *Annual Review of Political Science*, 3(1), 475-507.
- Listhaug, O., & Ringdal, K. (2008). Trust in political institutions. In H. Ervasti, T. Fridberg, M. Hjerm & K. Ringdal (Eds.), *Nordic social attitudes in a European perspective*. Cheltenham: Edward Elgar Publishing Ltd.
- Lockwood, D. (1964). Social Integration and System Integration. In G. K. Zollschan & W. Hirsch (Eds.), *Explorations in Social Change*. London: Routledge.
- LSE. (2008). Social cohesion, trust and participation: social capital, social policy and social cohesion in the European Union and candidate countries: European Observatory on the Social Situation - Social Capital Network.
- Marien, S. (2013). Measuring political trust across time and space. In M. Hooghe & S. Zmerli (Eds.), *Political Trust: Why context matters* (pp. 13-46). Colchester: ECPR Press.
- Marien, S., & Hooghe, M. (2011). Does political trust matter? An empirical investigation into the relation between political trust and support for law compliance. *European Journal of Political Research*, 50(2), 267-291.
- Martin, P., & Lynn, P. (2011). The effects of mixed mode survey designs on simple and complex analyses *ISER Working Paper Series (No. 2011-28)*: Institute for Social and Economic Research (ISER), University of Essex.
- Matthews, G. (2008). Reinforcement Sensitivity Theory: A critique from cognitive science. In P. J. Corr (Ed.), *The reinforcement sensitivity theory of personality* (pp. 482-507). Cambridge: Cambridge University Press.
- McCrae, R. R., Costa, J., Paul T, & Martin, T. A. (2005). The NEO-PI-3: A more readable revised NEO personality inventory. *Journal of personality assessment*, 84(3), 261-270.
- McCrae, R. R., & Costa Jr, P. T. (1996). Toward a new generation of personality theories: Theoretical contexts for the five-factor model. In J. S. Wiggins (Ed.), *The five-factor model of personality* (pp. 51-87). London: The Guilford Press.
- McCrae, R. R., & Costa Jr, P. T. (1999). The five-factor theory of personality. In O. P. Johns, R. W. Robbins & L. A. Pervin (Eds.), *Handbook of personality: theory and research* (Vol. 2, pp. 139-153). London: The Guilford Press.
- McCrae, R. R., & Costa, P. (2010). *NEO Inventories professional manual*. Lutz, FL: Psychological Assessment Resources Inc.
- McCrae, R. R., Jang, K. L., Livesley, W. J., Riemann, R., & Angleitner, A. (2001). Sources of structure: Genetic, environmental, and artifactual influences on the covariation of personality traits. *Journal of personality*, 69(4), 511-535.
- McCrae, R. R., Martin, T. A., & Costa, P. T. (2005). Age trends and age norms for the NEO Personality Inventory-3 in adolescents and adults. *Assessment*, 12(4), 363-373.
- Morales-Vives, F., De Raad, B., & Vigil-Colet, A. (2012). Psycholexical Value Factors in Spain and Their Relation with Personality Traits. *European Journal of Personality*, 26(6), 551-565.
- moralfoundations.org. (2015). MoralFoundations.org Retrieved 23 September, 2015, from <http://moralfoundations.org/>

- Morgeson, F. V., & Petrescu, C. (2011). Do they all perform alike? An examination of perceived performance, citizen satisfaction and trust with US federal agencies. *International Review of Administrative Sciences*, 77(3), 451-479.
- Müller, J., & Schwieren, C. (2012). What can the Big Five personality factors contribute to explain small-scale economic behavior? *Tinbergen Institute Discussion Paper No. 12-028/1*.
- Muthen, B., & Muthen, L. (2013). Confirmatory Factor Analysis Retrieved 27 March 2013, from <http://www.statmodel.com/discussion/messages/9/9.html>
- Naef, M., & Schupp, J. (2009a). Can we trust the trust game? A comprehensive examination *Royal Holloway College, Discussion Paper Series (No. 2009-05)*: Royal Holloway, University of London.
- Naef, M., & Schupp, J. (2009b). Measuring trust: Experiments and surveys in contrast and combination *SOEPpapers on Multidisciplinary Panel Data Research*, No. 167. Berlin.
- Newton, K. (2001). Trust, social capital, civil society, and democracy. *International Political Science Review*, 22(2), 201-214.
- Nezlek, J. B. (2008). An introduction to multilevel modeling for social and personality psychology. *Social and Personality Psychology Compass*, 2(2), 842-860.
- NSD. (2012a). ESS2 - 2004 Deviations - United Kingdom Retrieved 27 March 2013, from <http://ess.nsd.uib.no/ess/round2/deviations-land.html?land=826>
- NSD. (2012b). ESS4 - 2012 Deviations - United Kingdom Retrieved 27 March 2013, from <http://ess.nsd.uib.no/ess/round4/deviations-land.html?land=826>
- NSD. (2013a). The comparability of attitude measurements: Measurement equivalence Retrieved 20/09/15, from <http://essedunet.nsd.uib.no/cms/topics/immigration/2/all.html>
- NSD. (2013b). Human Values Retrieved 23 August, 2014, from <http://essedunet.nsd.uib.no/cms/topics/1/4/2.html>
- NSD. (2013c). Multilevel Models, Chapter 3: The basic two-level models Retrieved 25 April, 2015, from <http://essedunet.nsd.uib.no/cms/topics/multilevel/ch3/all.html>
- Nye, J. S., Zelikow, P., & King, D. C. (1997). *Why people don't trust government*. London: Harvard University Press.
- Olivera, J. (2013). On changes in general trust in Europe *UCD Geary Institute Discussion Paper Series (Geary WP2013/01)*.
- Olver, J. M., & Mooradian, T. A. (2003). Personality traits and personal values: a conceptual and empirical integration. *Personality and individual differences*, 35(1), 109-125.
- Orbell, J., & Dawes, R. M. (1991). A "cognitive miser" theory of cooperators advantage. *American Political Science Review*, 85(2), 515-528.
- Oskarsson, S., Svensson, T., & Öberg, P. (2009). Power, Trust, and Institutional Constraints Individual Level Evidence. *Rationality and Society*, 21(2), 171-195.
- Paldam, M. (2009). The macro perspective on generalized trust. In G. T. Svendsen & G. L. H. Svendsen (Eds.), *Handbook of Social Capital: The Troika of Sociology, Political Science and Economics* (pp. 354-372). Cheltenham: Edward Elgar Publishing Limited.
- Park, C.-u., & Subramanian, S. (2012). Voluntary association membership and social cleavages: a micro-macro link in generalized trust. *Social Forces*, 90(4), 1183-1205.
- Parks-Leduc, L., Feldman, G., & Bardi, A. (2014). Personality traits and personal values: a meta-analysis. *Personality and Social Psychology Review*. doi: 10.1177/1088868314538548
- Paxton, P. (2007). Association memberships and generalized trust: A multilevel model across 31 countries. *Social forces*, 86(1), 47-76.
- Pickering, A., & Corr, P. J. (2008). JA Gray's reinforcement sensitivity theory (RST) of personality. In G. J. Boyle, G. Matthews & D. H. Saklofske (Eds.), *The SAGE Handbook of Personality Theory and Assessment* (Vol. 1, pp. 239-256). Thousand Oaks, CA: SAGE Publications, Inc.

- Polillo, S. (2012). Globalization: Civilizing or destructive? An empirical test of the international determinants of generalized trust. *International Journal of Comparative Sociology*, 53(1), 45-65.
- Pollet, T. V., Roberts, S. G., & Dunbar, R. I. (2015). Extraverts have larger social network layers. *Journal of Individual Differences*, 32(3), 161-169.
- Press, O. U. (2015). Oxford Dictionaries Retrieved 14 September, 2015, from <http://www.oxforddictionaries.com/>
- Putnam, R. D. (2000). *Bowling alone: the collapse and revival of American democracy*. New York: Simon & Schuster
- Rahn, W. M., & Transue, J. E. (1998). Social trust and value change: The decline of social capital in American youth, 1976–1995. *Political Psychology*, 19(3), 545-565.
- Reeskens, T. (2009). *On the Nature of Generalized Trust. A Cross-National Inquiry into the Relation between Human Values and Generalized Trust*. Paper presented at the 106th Annual Meeting of the American Political Science Association, Toronto.
- Reeskens, T., & Hooghe, M. (2008). Cross-cultural measurement equivalence of generalized trust. Evidence from the European Social Survey (2002 and 2004). *Social Indicators Research*, 85(3), 515-532.
- Robbins, B. G. (2011). Neither government nor community alone: A test of state-centered models of generalized trust. *Rationality and Society*, 23(3), 304-346.
- Robbins, B. G. (unpub). Wherever You Go, No Matter the Weather, Always Bring Your Own Sunshine: Revisiting Thermal Climate Models of Generalized Trust with Cross-National Panel Data, 1981-2009. Available at SSRN: <http://ssrn.com/abstract=2195140> or <http://dx.doi.org/10.2139/ssrn.2195140>
- Roberts, S. G., Wilson, R., Fedurek, P., & Dunbar, R. (2008). Individual differences and personal social network size and structure. *Personality and individual differences*, 44(4), 954-964.
- Roccas, S., Sagiv, L., Schwartz, S. H., & Knafo, A. (2002). The big five personality factors and personal values. *Personality and social psychology bulletin*, 28(6), 789-801.
- Rosenberg, M. (1957). Misanthropy and attitudes toward international affairs. *Journal of Conflict Resolution*, 1(4), 340-345.
- Rothstein, B., & Stolle, D. (2002). *How political institutions create and destroy social capital: An institutional theory of generalized trust*. Paper presented at the 98th Meeting of the American Political Science Association in Boston, MA.
- Rothstein, B., & Stolle, D. (2008). The state and social capital: an institutional theory of generalized trust. *Comparative Politics*, 40(4), 441-459.
- Rothstein, B., & Uslaner, E. M. (2005). All for all: Equality, corruption, and social trust. *World politics*, 58(1), 41-72.
- Sapienza, P., Toldra-Simats, A., & Zingales, L. (2013). Understanding trust. *The Economic Journal*, 123(573), 1313-1332.
- Schäfer, G., Feith, M., Fritz, M., Johansson-Augier, A., & Wieland, U. (2007). Europe in figures - Eurostat yearbook 2006-07: Office for Official Publications of the European Communities, Luxembourg.
- Schoon, I., & Cheng, H. (2011). Determinants of political trust: a lifetime learning model. *Developmental Psychology*, 47(3), 619-631.
- Schwartz, S. H. (2001). European Social Survey Core Questionnaire Development – Chapter 7: A proposal for measuring value orientations across nations. London: European Social Survey, City University London.
- Schwartz, S. H. (2006). A theory of cultural value orientations: Explication and applications. *Comparative sociology*, 5(2), 137-182.
- Schwartz, S. H. (2007a). Universalism values and the inclusiveness of our moral universe. *Journal of Cross-Cultural Psychology*, 38(6), 711-728.

- Schwartz, S. H. (2007b). Value orientations: measurement, antecedents and consequences across nations. In R. Jowell, C. Roberts, R. Fitzgerald & G. Eva (Eds.), *Measuring attitudes cross-nationally: lessons from the European Social Survey* (pp. 161-193). London: SAGE Publications Ltd.
- Schwartz, S. H. (online). Computing scores for the 10 human values Retrieved 23 August, 2014, from http://www.europeansocialsurvey.org/docs/methodology/ESS1_human_values_scale.pdf
- Segarra, P., Ross, S. R., Pastor, M. C., Montañés, S., Poy, R., & Molto, J. (2007). MMPI-2 predictors of Gray's two-factor reinforcement sensitivity theory. *Personality and individual differences*, 43(3), 437-448.
- Sharpe, J. P., Martin, N. R., & Roth, K. A. (2011). Optimism and the Big Five factors of personality: Beyond neuroticism and extraversion. *Personality and individual differences*, 51(8), 946-951.
- Shweder, R., Much, N., Mahapatra, M., & Park, L. (1997). The "Big Three" of Morality, (Autonomy, Community, Divinity) and the "Big Three" Explanations of Suffering. In A. M. Brandt & P. Rozin (Eds.), *Morality and health* (pp. 119-169). London: Routledge, Inc.
- Simon, J. J., Walther, S., Fiebach, C. J., Friederich, H.-C., Stippich, C., Weisbrod, M., & Kaiser, S. (2010). Neural reward processing is modulated by approach-and avoidance-related personality traits. *Neuroimage*, 49(2), 1868-1874.
- Sirgy, M. J. (2011). Societal QOL is More than the Sum of QOL of Individuals: The Whole is Greater than the Sum of the Parts. *Applied Research in Quality of Life*, 6(3), 329-334.
- Smillie, L. D. (2008). What is reinforcement sensitivity? Neuroscience paradigms for approach-avoidance process theories of personality. *European Journal of Personality*, 22(5), 359-384.
- Smith, P. B. (2004). Acquiescent response bias as an aspect of cultural communication style. *Journal of Cross-Cultural Psychology*, 35(1), 50-61.
- Snijders, T. A. B., & Bosker, R. J. (2012). *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling* (2nd ed.). London: SAGE Publications Ltd.
- Steel, P., Schmidt, J., & Shultz, J. (2008). Refining the relationship between personality and subjective well-being. *Psychological Bulletin*, 134(1), 138-161.
- Stelmack, R. M., & Rammsayer, T. H. (2008). Psychophysiological and biochemical correlates of personality. In G. J. Boyle, G. Matthews & D. H. Saklofske (Eds.), *The SAGE handbook of personality theory and assessment: personality theories and models* (Vol. 1, pp. 33-55). London: SAGE Publications Ltd.
- Stiglitz, J., Sen, A., & Fitoussi, J.-P. (2009). The measurement of economic performance and social progress revisited. Paris: Commission on the Measurement of Economic Performance and Social Progress.
- Stoop, I. (2007). If it bleeds, it leads: the impact of media-reported events. In R. Jowell, C. Roberts, R. Fitzgerald & G. Eva (Eds.), *Measuring attitudes cross-nationally: lessons from the European Social Survey*. London: SAGE Publications Ltd.
- Sturgis, P., Patulny, R., & Allum, N. (2009). *Re-evaluating the individual level causes of trust: a panel data analysis*. Paper presented at the Reciprocity: theories and facts conference Milan, Italy.
- Sturgis, P., Patulny, R., Allum, N., & Buscha, F. (2012). Social connectedness and generalized trust: a longitudinal perspective *ISER Working Paper Series (No. 2012-09)*: Institute for Social and Economic Research (ISER), University of Essex.
- Sturgis, P., & Smith, P. (2010). Assessing the validity of generalized trust questions: What kind of trust are we measuring? *International Journal of Public Opinion Research*, 22(1), 74-92.

- Thomas, C. W. (1998). Maintaining and restoring public trust in government agencies and their employees. *Administration & society*, 30(2), 166-193.
- Thomassen, J. (2001). European Social Survey Core Questionnaire Development – Chapter 4: Media and communications questions. London: European Social Survey, City University London.
- UNE. (2000). Chapter 4 - Analysing the data (Part II - Descriptive statistics): Determining if skewness and kurtosis are significantly non-normal Retrieved 27 March 2013, from http://www.une.edu.au/WebStat/unit_materials/c4_descriptive_statistics/determine_skew_kurt.html
- Uslaner, E. M. (2002). *The moral foundations of trust*. Cambridge: Cambridge University Press.
- Uslaner, E. M. (2004). Trust and Corruption. In J. G. Lambsdorff, M. Taube & M. Schramm (Eds.), *The New Institutional Economics of Corruption*. London: Routledge.
- Uslaner, E. M. (2008). Where You Stand Depends Upon Where Your Grandparents Sat The Inheritability of Generalized Trust. *Public Opinion Quarterly*, 72(4), 725-740.
- Van de Walle, S., & Bouckaert, G. (2003). Public service performance and trust in government: the problem of causality. *International Journal of Public Administration*, 26(8-9), 891-913.
- Van de Walle, S., Van Roosbroek, S., & Bouckaert, G. (2008). Trust in the public sector: is there any evidence for a long-term decline? *International Review of Administrative Sciences*, 74(1), 47-64.
- van den Bos, W., van Dijk, E., Westenberg, M., Rombouts, S. A., & Crone, E. A. (2009). What motivates repayment? Neural correlates of reciprocity in the Trust Game. *Social cognitive and affective neuroscience*. doi: 10.1093/scan/nsp009
- Van der Veld, W. M., & Saris, W. E. (2011). Causes of generalized social trust. In E. Davidov, P. Schmidt & J. Billiet (Eds.), *Cross-Cultural Analysis: Methods and Applications* London: Routledge.
- Vauclair, C. M., & Fischer, R. (2011). Do cultural values predict individuals' moral attitudes? A cross-cultural multilevel approach. *European Journal of Social Psychology*, 41(5), 645-657.
- Vecchione, M., Alessandri, G., Barbaranelli, C., & Caprara, G. (2011). Higher-order factors of the big five and basic values: Empirical and theoretical relations. *British Journal of Psychology*, 102(3), 478-498.
- Volk, S., Thöni, C., & Ruigrok, W. (2011). Personality, personal values and cooperation preferences in public goods games: A longitudinal study. *Personality and individual differences*, 50(6), 810-815.
- von Collani, G., & Grumm, M. (2009). On the dimensional structure of personality, ideological beliefs, social attitudes, and personal values. *Journal of Individual Differences*, 30(2), 107-119.
- Wagner, A. F., Schneider, F., & Halla, M. (2009). The quality of institutions and satisfaction with democracy in Western Europe—a panel analysis. *European Journal of Political Economy*, 25(1), 30-41.
- Wang, L., & Gordon, P. (2011). Trust and institutions: A multilevel analysis. *The Journal of Socio-Economics*, 40(5), 583-593.
- Weiss, A., & Costa Jr, P. T. (2005). Domain and facet personality predictors of all-cause mortality among Medicare patients aged 65 to 100. *Psychosomatic medicine*, 67(5), 724-733.
- Wiggins, J. S. (1996). *The five-factor model of personality: Theoretical perspectives*. New York: Guilford Press.
- Yamagishi, T., Kikuchi, M., & Kosugi, M. (1999). Trust, gullibility, and social intelligence. *Asian Journal of Social Psychology*, 2(1), 145-161.

- Yamagishi, T., & Yamagishi, M. (1994). Trust and commitment in the United States and Japan. *Motivation and emotion*, 18(2), 129-166.
- Yang, K., & Holzer, M. (2006). The performance–trust link: Implications for performance measurement. *Public Administration Review*, 66(1), 114-126.
- You, J. s. (2012). Social trust: Fairness matters more than homogeneity. *Political Psychology*, 33(5), 701-721.
- Zak, P. J., & Knack, S. (2001). Trust and growth. *The Economic Journal*, 111(470), 295-321.
- Zak, P. J., Kurzban, R., & Matzner, W. T. (2004). The neurobiology of trust. *Annals of the New York Academy of Sciences*, 1032(1), 224-227.
- Zimdars, A., & Tampubolon, G. (2012). Ethnic diversity and Europeans' generalised trust: how inclusive immigration policy can aid a positive association. *Sociological Research Online*, 17(3). doi: 10.5153/sro.2643
- Zmerli, S., Newton, K., & Montero, J. R. (2007). Trust in people, confidence in political institutions, and satisfaction with democracy. In J. W. van Deth, J. R. Montero & A. Westholm (Eds.), *Citizenship and involvement in european democracies: a comparative analysis* (pp. 35-65). New York: Routledge.

The experiment in Chapter 5 was financed in part by ESSEXLab Seedcorn funding and in part by funds from my ESRC Research Training Support Grant (with thanks to colleagues in ISER for their support with this).

The survey data in this chapter was collected using Qualtrics software, Version 57,397 of the Qualtrics Research Suite. Copyright © 2014 Qualtrics. Qualtrics and all other Qualtrics product or service names are registered trademarks or trademarks of Qualtrics, Provo, UT, USA. <http://www.qualtrics.com>