A study of academic resilience among children at risk of poverty in Ireland

Rachel Perkins, B.A., M.Psych.Sc.

Thesis submitted to Dublin City University for the award of Doctor of Philosophy

January, 2018

Primary supervisor: Dr. Catherine Maunsell
Auxiliary supervisor: Professor Mark Morgan

School of Human Development, Dublin City University Institute of Education

I hereby certify that this material, which I now submit for assessment on the programme of study leading to the award of Doctor of Philosophy is entirely my own work, and that I have exercised reasonable care to ensure that the work is original, and does not to the best of my knowledge breach any law of copyright, and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of my work.

Signed: ....ID No.: 59267267   Date: ....

Table of Contents

Acknowledgments ... vii
List of tables ... viii
List of figures ... xii
Abstract ... xiii
Abstract ... xiii
Introduction ... xiv

Chapter 1. Social marginalisation in education ... 1
1.1. Conceptualising social marginalisation in education ... 2
1.1.1. Measuring social marginalisation in education ... 4
1.1.2. Economic, social and cultural capital and their relationships with academic attainment in Ireland ... 7
1.2. Addressing social marginalisation in education in Ireland ... 10
1.3. Resilience and social marginalisation in education ... 14
1.4. Sociocultural context ... 16
1.5. Conclusions ... 18

Chapter 2. Resilience ... 20
2.1. Conceptualising resilience ... 20
2.1.1. Expressions of resilience ... 21
2.1.2. Locus of resilience and stability over time ... 24
2.1.3. Differentiating resilience from other constructs ... 27
2.1.4. Resilience as an active process ... 28
2.2. Risk, positive adjustment and protective factors ... 31
2.2.1. Identifying risk ... 31
2.2.2. Positive adjustment ... 32
2.2.3. Protective factors ... 34
2.3. Theoretical framework ... 37
2.4. Approaches to studying resilience ... 41
2.5. Resilience in education ... 42
2.5.1. Definitions of resilience in education ... 43
2.5.2. Academic resilience ... 44
2.5.3. Factors associated with academic and educational resilience ... 48
2.5.3.1. Relationships with family, teachers and peers ... 49
2.5.3.2. Educational aspirations and expectations ... 51
2.5.3.3. Parental involvement in their child's education ... 52
2.5.3.4. Engagement and meaningful participation ... 54
2.5.3.5. Personal attributes of the student ... 55
2.5.3.6. Gender and resilience ... 56
2.6. The current study ... 56

Chapter 3. Methodology 60
3.1. Growing Up in Ireland 60
3.1.1. Conceptual framework 61
3.1.2. Sample 62
3.1.3. Response rates 63
3.1.4. Survey instruments and procedures 65
3.1.5. Ethical considerations 67
3.2. Scales measured in GUI and used in the current study 67
3.2.1. Piers-Harris Children's Self-concept Scale 67
3.2.2. Strengths and Difficulties Questionnaire (SDQ) 69
3.2.3. Drumcondra Tests 71
3.2.4. Emotionality, Activity and Sociability Temperament Scale (EAS) 72
3.2.5. Parenting Style Inventory – II (PSI-II) 73
3.2.6. Pianta Child-Parent Relationship Scale (CPR-S) 74
3.2.7. Parental Monitoring and Child Disclosure 75
3.2.8. Ten Item Personality Inventory (TIPI) 76
3.2.9. The Inventory of Parent and Peer Attachment (IPPA) 76
3.2.10. The Short Mood and Feelings Questionnaire (SMFQ) 77
3.2.11. Household social class 77
3.2.12. Equivalised income 78
3.3. Identification and classification variables in GUI 78
3.3.1. Background characteristics 79
3.3.2. Relationships with family, teachers and peers 80
3.3.3. Educational expectations 83
3.3.4. Attitudes towards school 85
3.3.5. Parental involvement in their child's education 85
3.3.6. Child's engagement/meaningful participation 86
3.3.7. Personal attributes of the child 92
3.4. Analysis strategy 93
3.4.1. Aim 1: Identify and describe academic resilience 94
3.4.2. Aim 2: Identify unique predictors of academic resilience at age nine and 13 95
3.4.3. Aim 3: Develop and test a multi-dimensional model of academic resilience 97
3.5. Conclusions 99

Chapter 4. Results – Identifying and describing academic resilience 101
4.1. Identifying and describing academic resilience 102
4.1.1. Children whose families have access to a medical card 104
4.1.2. Resilience and vulnerability 109
4.2. Identifying unique predictors of resilience at nine and 13 years old 116
4.2.1. Background characteristics 119
4.2.2. Relationships with family, teachers and peers 122
4.2.3. Educational expectations 126
4.2.4. Attitudes towards school 129
4.2.5. Parental involvement in their child's education 130
4.2.6. Engagement and meaningful participation 133
4.2.7. Personal attributes of the child 139

4.3. Transition from primary to post-primary school 142
4.4. Conclusions 144

Chapter 5. Results – Identifying processes associated with academic resilience 150
5.1. Analytic strategy 151
5.1.1. Model fit indices 153
5.2. Theoretical model 154
5.3. Hypothesised model – age nine 159
5.3.1. Assumptions 164
5.3.2. Measurement model – age nine 166
5.3.2.1. Exploratory Factor Analysis 166
5.3.2.2. Confirmatory Factor Analysis (CFA) 167
5.3.3. Structural model – age nine 169
5.3.3.1. The hypothesised model 169
5.3.3.2. Model estimation 169
5.3.3.3. Model fit 170
5.3.3.4. Direct effects in the final model of resilience – age nine 173
5.3.3.5. Indirect effects in the final model of resilience – age nine 175
5.3.3.6. Variance explained in the final model of resilience – age nine 176
5.3.4. Nested model – age nine 177
5.3.4.1. The hypothesised nested model - age nine 177
5.3.4.2. Nested model estimation – age nine 178
5.3.4.3. Model fit for the nested model – age nine 179
5.3.4.4. Direct effects in the nested model of resilience – age nine 180
5.3.4.5. Variance explained in the nested model of resilience – age nine 181
5.4. Hypothesised model of resilience – age 13 181
5.4.1. Assumptions 187
5.4.2. Measurement model – age 13 188
5.4.2.1. Exploratory Factor Analysis 188
5.4.2.2. Confirmatory Factor Analysis (CFA) 189
5.4.3. Structural model – age 13 191
5.4.3.1. The hypothesised model 191
5.4.3.2. Model estimation 191
5.4.3.3. Model fit 192
5.4.3.4. Direct effects in the final model of resilience – age 13 196
5.4.3.5. Indirect effects in the final model of resilience – age 13 198
5.4.3.6. Variance explained in the final model of resilience – age 13 199
5.4.4. Nested model – age 13 200
5.4.4.1. The hypothesised nested model – age 13 200
5.4.4.2. Nested model estimation – age 13 201
5.4.4.3. Model fit for the nested model – age 13 202
5.4.4.4. Direct Effects in the nested model of resilience – age 13 203
5.4.4.5. Variance explained in the nested model of resilience – age 13 204
5.4.5. Gender as a moderating variable – age 13 204
5.5. How do the final models of resilience compare to the theoretical model? 207
5.6. Conclusions 212

Chapter 6. Conclusions and implications 215
6.1. Overview of the current study 215
6.2. Variation in experience of risk 219
6.3. Resilience as a dynamic concept 223
6.4. The influence of economic capital on academic resilience 225
6.5. Academic resilience and psychological wellbeing 227
6.6. The role of parents, teachers and peers in the development of resilience 229
6.7. Gender and academic resilience 232
6.8. Limitations of this study 233
6.9. Future research 237
6.10. Epilogue 239

References: 242
Appendix A: Ancillary tables for Chapter 3 258
Appendix B: Ancillary tables for Chapter 4 274
Appendix C: Ancillary tables for Chapter 5 287

Acknowledgments

I would like to take this opportunity to express my appreciation and thanks to my supervisors, Professor Mark Morgan and Dr. Catherine Maunsell, for their continued support throughout my PhD study. Your guidance, encouragement and patience were invaluable to me throughout the course of my research.

Thanks are also due to the Educational Research Centre (ERC) for financial and professional support. In particular, I would like to thank Dr. Peter Archer, Chief Executive Officer at the ERC, for his continued support and assistance. Thanks also to Dr. Susan Weir for her valuable advice on various aspects of my study. I would also like to express my gratitude to Aidan Clerkin, Lorraine Gilleece, Lauren Kavanagh, Carly Cheevers and Yseult Freeney for their comments and suggestions on various chapters of my thesis.

I would also like to express my gratitude to my friends and family who supported me since the beginning of my study. Especially, thanks to Valeria Cavalli, Adrian O'Flaherty and my parents, Jim and Brid Perkins, for always being willing to offer a listening ear in times of need.

List of tables

Table 3.1: School- and home-based instruments administered in the GUI study 66

Table 3.2: Reliability coefficients for the six subscales and total scale of the Piers-Harris Children's Self-concept Scale (2nd edition) 68

Table 3.3: Reliability coefficients for the five subscales and total scale of the Strengths and Difficulties Questionnaire (SDQ) in the full GUI sample (nine and 13 years old) 70

Table 3.4: Reliability coefficients for the five subscales and total scale of the Strengths and Difficulties Questionnaire (SDQ) in the sample of full medical card holders (nine and 13 years old) 70

Table 3.5: Correlation coefficients for the five subscales and total scale of the SDQ parent and teacher scores in the full GUI sample (nine years old) 71

Table 3.6: Reliability coefficients for Form A vocabulary test of the DPRT-R, levels 2, 3 and 4 (nine years old) 72

Table 3.7: Reliability coefficients for Form A of the DPMT-R, levels 2,3 and 4 (nine years old) 72

Table 3.8: Reliability coefficients for DRT Form C (verbal reasoning and numeric ability; 13 years old) 72

Table 3.9: Reliablity coefficients for the four subscales of the Emotionality, Activity and Sociability Temperament Scale (EAS) (nine years old) 73

Table 3.10: Correlation coefficients for the intercorrelations betweeb the four subscales of the EAS scale (nine years old) 73

Table 3.11: Reliablity coefficients for the two subscales of the Parenting Style Inventory (PSI) (nine years old) 74

Table 3.12: Reliablity coefficients for the three subscales of the Parenting Style Inventory (PSI) (13 years old) 74

Table 3.13: Reliablity coefficients for the three subscales of the Child-Parent Rleationship scale (CPR-S) (nine years old) 75

Table 3.14: Reliablity coefficients for the two subscales of the Child-Parent Rleationship scale (CPR-S) (13 years old) 75

Table 3.15: Reliability coefficients of the five subscales of the Ten Item Personality Inventory (TIPI) (13 years old) 76

Table 3.16: Reliability coefficients for the two subscales of the Inventory of Parent and Peer Attachment (IPPA – peers) (13 years old) 77

Table 3.17: Variables measuring the child's background characteristics 80

Table 3.18: Variables measuring relationships with family 81

Table 3.19: Variables measuring relationships with teachers 82

Table 3.20: Variables measuring relationships with peers 82

Table 3.21: Variables measuring the child's own educational expectations 83
Table 3.22: Variables measuring the parents' educational expectations for their child 83
Table 3.23: Variables measuring the teachers' educational expectations for the child 84
Table 3.24: Variables measuring the child's attitude towards school 85
Table 3.25: Variables measuring parental involvement with their child's education 86
Table 3.26: Variables measuring the child's lifestyle 87
Table 3.27: Variables measuring the child's engagement with family 89
Table 3.28: Variables measuring the child's engagement with school 91
Table 3.29: Variables measuring the personal attributes of the child – self-concept 92
Table 3.30: Variables measuring the personal attributes of the child – psychological adjustment 93
Table 3.31: Model fit statistics and associated cut-off values used in the current study 99
Table 4.1: Mean reading and mathematics scores at age nine, overall and by medical card status 105
Table 4.2: Mean equivalised household income at age nine, overall and by medical card status 105
Table 4.3: Percentage of nine-year-old children who belong to each household class category, overall and by medical card status 106
Table 4.4: Percentage of nine-year-old children who attended schools according to DEIS category, overall and by medical card status 106
Table 4.5: Mean verbal reasoning and numerical ability percent correct scores at age 13, overall and by medical card status 108
Table 4.6: Mean equivalised income at age 13, overall and by medical card status 109
Table 4.7: Percentage of 13-year-old children who belong to each household class category, overall and by medical card status 109
Table 4.8: Percentage of 13-year-old children who attended schools according to DEIS category, overall and by medical card status 109
Table 4.9: Mean reading and mathematics scores at age nine, overall and by resilience status 111
Table 4.10: Mean equivalised household income at age nine, overall and by resilience status 112
Table 4.11: Percentage of nine-year-old children who belong to each household class category, by resilience status 112
Table 4.12: Percentage of nine-year-old children who attended schools according to DEIS category, by resilience status 113
Table 4.13: Mean verbal reasoning and numerical ability scores at age 13, by resilience status 114

Table 4.14: Mean equivalised household income at age 13, overall and by resilience status 115
Table 4.15: Percentage of 13-year-old children who belong to each household class category, by resilience status 116
Table 4.16: Percentage of 13-year-old children who attend schools according to DEIS category, by resilience status 116
Table 4.17: Final model of variables measuring background characteristics and resilience, age nine 120
Table 4.18: Final model of variables measuring background characteristics and resilience, age 13 121
Table 4.19: Final model of variables measuring relationship with family and resilience, age nine 122
Table 4.20: Final model of variable measuring relationship with peers and resilience, age nine 123
Table 4.21: Final model of variables measuring relationship with family and resilience, age 13 124
Table 4.22: Final model of variables measuring child's relationship with their teacher and resilience, age 13 125
Table 4.23: Final model of variable measuring the parents' educational expectations for their child and resilience, age nine 126
Table 4.24: Final model of variable measuring teacher's educational expectations for the study child and resilience, age nine 127
Table 4.25: Final model of variable measuring the child's educational expectations for themselves and resilience, age 13 128
Table 4.26: Final model of variable measuring the parents' educational expectations for their child and resilience, age 13 129
Table 4.27: Final model of variable measuring the child's attitude towards school and resilience, age nine 129
Table 4.28: Final model of variable measuring the child's attitude towards school and resilience, age 13 130
Table 4.29: Final model of variables measuring parental involvement in their child's education and resilience, age nine 131
Table 4.30: Final model of variables measuring parental involvement in their child's education and resilience, age 13 132
Table 4.31: Final model of variables measuring the study child's lifestyle and resilience, age nine 134
Table 4.32: Final model of variables measuring engagement with family and resilience, age nine 135
Table 4.33: Final model of variables measuring engagement with school and resilience, age nine 136

Table 4.34: Final model of variables measuring the study child's lifestyle and resilience, age 13 137
Table 4.35: Final model of variable measuring engagement with school and resilience, age 13 138
Table 4.36: Final model of variables measuring the child's self-concept and resilience, age nine 139
Table 4.37: Final model of the variables measuring the child's psychological adjustment and resilience, age nine 140
Table 4.38: Final model of the variable measuring the child's self-concept and resilience, age 13 141
Table 4.39: Final model of the variables measuring the child's psychological adjustment and resilience, age 13 142
Table 4.40: Final model of scale measuring transition from primary to post-primary school and resilience, age 13 143
Table 4.41: Mean reading and mathematics scores at age nine, by resilience status at age nine and 13 144
Table 5.1: Results from the Shapiro-Wilks Test of Normality for all scale variables included in the hypothesised model – age nine 166
Table 5.2: Unstandardised coefficients, standardised coefficients, and significance levels for model in Figure 5.5 171
Table 5.3: Unstandardised coefficients, standardised coefficients, and significance levels for the nested model in Figure 5.7 180
Table 5.4: Results from the Shapiro-Wilks Test of Normality all scale variables included in the hypothesised model – age 13 188
Table 5.5: Unstandardised coefficients, standardised coefficients, and significance levels for model in Figure 5.11 193
Table 5.6: Unstandardised coefficients, standardised coefficients, and significance levels for the nested model in Figure 5.13 203
Table 5.7: Unstandardised coefficients, standardised coefficients, and significance levels for models 1 to 3 presented in figures 5.14 to 5.16 206
Table 5.8: Mean percent correct scores of boys and girls on the reading and mathematics tests at age nine, and the verbal reasoning and numerical ability tests – age 13 207

List of figures

No table of figures entries found. Figure 2.1: Examples of pathways of adaptive functioning before and after an acute-onset traumatic experience 23

Figure 2.2: Examples of pathways of adaptive functioning before and after exposure to prolonged and severe adversity 24

Figure 2.3: Examples of models illustrating the relationship between adversity, adaptive behaviour and factors that may promote or protect adaptive 36

Figure 2.4: Bronfenbrenner's bio-ecological model of child development 39

Figure 5.1: Theoretical model of academic resilience 158

Figure 5.2: Hypothesised model of academic resilience – age nine 165

Figure 5.3: Hypothesised model of confirmatory factor analysis for the latent variable measuring teachers' ratings of school performance – age nine 168

Figure 5.4: Final model of confirmatory factor analysis for the latent variable measuring teachers' ratings of school performance – age nine 169

Figure 5.5: Final model of academic resilience – age nine 172

Figure 5.6: Hypothesised nested model of academic resilience – age nine 178

Figure 5.7: Final nested model of academic resilience – age nine 180

Figure 5.8: Hypothesised model of academic resilience – age 13 185

Figure 5.9: Hypothesised model of confirmatory factor analysis for the latent variable measuring disengagement from school – age 13 190

Figure 5.10: Final model of confirmatory factor analysis for the latent variable measuring disengagement from school – age 13 191

Figure 5.11: Final model of academic resilience – age 13 195

Figure 5.12: Hypothesised nested model of academic resilience – age 13 201

Figure 5.13: Final nested model of academic resilience – age 13 202

Figure 5.14: Model 1: hypothesised model of emotionality, resilience and gender - age 13 205

Figure 5.15: Model 2: hypothesised model of intellectual self-concept, resilience and gender – age 13 205

Figure 5.16: Model 2: hypothesised model of hyperactivity, resilience and gender – age 13 206

Abstract

A study of academic resilience among children at risk of poverty in Ireland

Rachel Perkins

Despite the strong link between socioeconomic status and academic achievement, some children at risk of poverty have been found to be successful in school. The available literature calls these children resilient. The phenomenon of resilience, in the field of education and elsewhere, has become more popular in recent times both as a research topic and an area of policy interest. However, while many studies examine specific aspects of academic resilience few bring together the resilience literature in a more comprehensive way to develop and test a holistic model of academic resilience. This study aims to develop a multi-dimensional model of academic resilience based on the literature and to examine if the same predictors of academic resilience (and the associated processes between them) apply at difference time points in a child's development. Using data from the nine- and 13-year-old child cohorts of the *Growing Up in Ireland* study, logistic regression analyses were used to identify unique predictors of academic resilience from seven key areas of a child's life associated with academic resilience: background characteristics; relationships with family, teachers and peers; educational expectations; attitudes towards school; parental involvement in their child's education; engagement and meaningful participation; and the personal attributes of the child. The pathways between these predictors were then tested separately for each age group, using structural equation modelling. Results indicate that, while there is partial support for the model of academic resilience at age 13, the results are inconclusive at age nine. A test of a nested model supported the hypothesis that a child's psychological adjustment, intellectual self-concept and gender were all directly related to academic resilience at age 13, while a similar model at age nine was not supported by the data. The findings are considered in terms of their relevance for policy. Limitations of the current study and areas for future research are also addressed.

Introduction

The finding that children who come from poorer backgrounds perform significantly less well academically has been well established in the educational research literature (Sirin, 2005). While many studies have examined the relationship between socioeconomic status and educational outcomes, there is no consensus as to which combination of indicators best represents socioeconomic status and measures used across studies differ greatly. Historically, many studies and policy initiatives aimed at addressing social marginalisation in education have focused primarily on economic indicators and many researchers have noted that a broader definition of social marginalisation in education is required if the impediments that prevent children from receiving benefit from education are to be fully understood (Downes & Gilligan, 2007; Kelleghan, 2001).

Kelleghan (2001), inspired by Bourdieu (1986), suggested that educational disadvantage, as defined in the Education Act (1998), can be considered in terms of economic, social and cultural capital. The current study concentrates on children experiencing economic adversity, thereby narrowing the focus of social marginalisation, however it goes beyond other studies by examining how factors associated with cultural and social capital (such as parental involvement in their child's education, family climate, engagement in extracurricular activities etc.) interact with each other in the lives of these children at risk of poverty. In this way, the current study contributes to our understanding of indicators of socioeconomic status and their relationship with social marginalisation in education, an aspect of educational research which Caro, Sandoval-Hernandez and Ludtke (2014) argue lacks solid theoretical meaning.

Despite the strong association between socioeconomic status and academic achievement, not all children at risk of poverty perform poorly in school. For example, a study of reading standards among children attending primary schools in Ireland designated as disadvantaged found that between 3% and 4% of children were performing at or above the 90th percentile (Eivers, Shiel & Shortt, 2004). These children who can be considered to be experiencing social marginalisation but who 'perform much higher than would be predicted by their background' (OECD, 2010, p. 62) can also be considered as demonstrating academic resilience.

Resilience research in the field of education has become more popular in recent times. However, while much of the literature emphasises that resilience is a dynamic concept that involves the interaction between an individual and the various contexts which they experience in their lives (Ungar, Ghazinour & Richter, 2013; Downes, 2017a), few studies explore the processes that contribute to more resilient outcomes and instead focus on identifying factors associated with the concept. The few studies that do examine the processes associated with resilience tend to focus on just one or two specific areas of a child's life (Schoon, 2006; Vanderbilt-Adriance & Shaw, 2006). Also, definitions of resilience vary greatly across studies and even within the same area of study. For example, the study of educational resilience can be classified further into different forms of educational resilience, including academic resilience, which is the focus of this study. While the number of studies examining educational resilience has grown in recent years, relatively few studies examine the specific construct of academic resilience.

The study of academic resilience can help researchers, policy makers and educators understand why some children do well in school, while others from similar backgrounds, schools and home environments do not do well academically. As such, the study of academic resilience is relevant to current educational policy in Ireland, especially in light of the new targets in relation to performance on national and international standardised tests set as part of the *National Strategy to Improve Literacy and Numeracy among Children and Young People* (DES, 2011; 2017a) and the latest revision of the DEIS initiative (DES, 2017b).

Three aims are outlined for the current study. First, this study aims to identify and describe children who are deemed to be at-risk from social marginalisation but who overcome the odds and perform better than is expected of them given the economic status of their families. As medical card possession has been found to be associated with poorer educational outcomes in Ireland (Sofroniou, Archer & Weir, 2004) and those who qualify for a medical card have low weekly incomes, children whose families have access to a medical card are considered to be at risk of poverty. In this way, an absolute measure of economic adversity, as opposed to a relative measure, is used in the current study. Children demonstrating greater levels of academic resilience are defined as those whose families have access to a medical card and whose literacy and numeracy scores on standardised tests of achievement are at least half of a standard deviation above the average literacy and numeracy scores of all children. These children will be identified using data from the Growing Up in Ireland (GUI) child cohort study, as this study contains a wealth of information from across many different contexts in children's lives in Ireland.

The second aim of the study is to identify predictors of academic resilience among children at risk of poverty. Logistic regression analysis is used to identify the factors that distinguish children demonstrating greater levels of academic resilience from children who are considered to be more academically vulnerable (i.e., children whose families have access to a medical card and who perform at or below the average level for all children with medical cards on standardised tests of literacy and numeracy). The third aim of the current study is to examine the processes through which academic resilience emerges. Using the predictors identified through the logistic regression analyses, a model of academic resilience is developed and tested using structural equation modelling (SEM). The current study expands on previous research by exploring these factors and processes from across the various spheres that the child encounters in their life, providing a more holistic view of academic resilience. Bronfenbrenner's bioecological theory of development (Bronfenbrenner & Morris, 1998) is used as a framework to understand these processes and the current study focuses on meso-systemic interactions, which have received little attention in studies of resilience (Ungar, Ghazinour & Richter, 2013). Using data from the GUI child cohort study also provides an opportunity to examine these processes at two time points in the child's life, namely at ages nine and 13 and adds to the literature on resilience as a dynamic construct which can change and develop throughout the life course.

This thesis is presented in six chapters. As social marginalisation in education and resilience are both complex concepts, they are, in the main, examined separately, in Chapters 1 and 2, respectively. Chapter 3 presents the methodology used in the current study, including an overview of the GUI child cohort study, descriptions of the scales used, the variables selected for analysis and the analysis strategy used. Chapter 4 presents the analysis for the first and second aims of the current study, describing children who demonstrate greater levels of academic resilience and the factors that predict academic resilience, while Chapter 5 describes the models of academic resilience developed and tested at ages nine and 13 (the third aim of the current study). The final chapter, Chapter 6, considers the implications of the findings from all analyses in the current study.

Chapter 1. Social marginalisation in education

Lower levels of performance in school and greater levels of educational disengagement among children from poorer families have been a concern for policy makers and researchers in Ireland over the last five decades and still remains at the forefront of educational policy in this country. The World Health Organisation refers to social exclusion and marginalisation as the process through which vulnerable groups are prevented from participating fully in social, political and economic life in the community (Downes, 2013). The issue of social marginalisation in education is characterised by unequal access to resources, capabilities and rights (WHO, 2008) and is often referred to as educational disadvantage in the field of education. Although the use of the term 'disadvantaged' in the education literature has been criticised as having negative implications for the individuals that it is attributed to and contributes to conceptualisations of educational exclusion rather than inclusion (Spring, 2007; Downes & Gilligan, 2007), it is used widely in the education literature. In the current study, reference is made to social marginalisation when describing children who have been prevented from achieving their full range of potentials in education however, where necessary (i.e., when referring to specific articles or the Education Act), reference is also made to educational disadvantage. While it is recognised that the term 'social marginalisation' may still be perceived negatively by those named as 'socially marginalised', it is preferable to the use of the term 'educational disadvantage', as it emphasises the need to change the system and not the child.

While many studies have highlighted the issue of lower levels of performance among children attending schools with high concentrations of children at risk of poverty, it is also acknowledged that not all children attending such schools perform poorly. These children can be considered to be demonstrating resilience. Social marginalisation and resilience are both complex conceptions and are examined, for the most part, separately in this thesis. This chapter provides an introduction to social marginalisation in education. First, conceptualisations of social marginalisation are considered, including how social marginalisation is measured in studies of education, and the associations between aspects of social marginalisation (conceptualised as economic, social and cultural capital) and academic achievement are described. Second, measures aimed at addressing social marginalisation in education in Ireland are outlined. Next, the concept of resilience, and in particular it's importance in the context of education, is introduced and is examined in more detail in Chapter 2. This chapter ends by presenting an overview of the sociohistorical context in which the current study is placed.

1.1. Conceptualising social marginalisation in education

Academic achievement is associated with educational attainment, such that children who perform less well in school generally obtain fewer educational qualifications than those who do well (Schoon, Jones, Cheng & Maughan, 2012). Educational attainment is in turn related to many important life outcomes, such as socioeconomic status, health and quality of life (von Stumm, 2017) and such associations underline the importance of education and the need to ensure that all children have access to the resources needed to be successful in school. Heckman (2006) notes that 'later attainments build on foundations that are laid down earlier' and that 'environments that do not stimulate the young and fail to cultivate skills at early ages place children at an early disadvantage' (p. 1900).The subject of social marginalisation in education has been examined for decades but yet remains at the forefront of educational policy (Downes & Gilligan, 2007). Indeed, of eight headline targets for the European Union in 2020, two focus on education and one of these specifically addresses social marginalisation in education through reduction of rates of early school leaving to below 10% (European Commission, 2010).

The Irish legislative definition of educational disadvantage refers to *the impediments to education arising from social or economic disadvantage which prevent students from deriving appropriate benefit from education* (Education Act, 1998, Section 32 [9]). This is most notably manifested through low levels of participation and achievement in school. As the Education Act outlines, educational disadvantage is closely linked to socioeconomic status and the relationship between socioeconomic status and student achievement is well documented with many studies confirming that children growing up in families experiencing social marginalisation are at an increased risk for a wide range of adverse outcomes, including poor academic achievement and adjustment problems in later life (Schoon, 2006; Eivers et al., 2010; Eivers, Shiel, Perkins & Cosgrove, 2005; Cosgrove, Kellaghan, Forde & Morgan, 2000; OECD, 2016; Eivers, Shiel & Shortt, 2004; Weir, 2001). In fact, even after adjusting for intelligence, children from low socioeconomic backgrounds have been found to perform on average a half a grade level below children from high socioeconomic backgrounds which illustrates the lasting influence that socioeconomic factors can have on life course development (von Stumm, 2017).

Since the 1960s, numerous international and country-specific studies have reported significant associations between students' socioeconomic background and academic achievement and many interventions and programmes have been developed to address poorer educational performance among children at risk of poverty (e.g. the Perry Preschool Project, the Rutland Street Project). Despite such interventions, student socioeconomic status remains one of the strongest correlates of academic performance, while at the school level the correlations are even stronger (Sirin, 2005). Indeed, results from the most recent cycle of the Programme for International Student Assessment (PISA; OECD, 2016), which examines student achievement in over 70 countries, found that across OECD countries, a student from a more socioeconomically advantaged background outperforms a student from an average background by 38 points on the PISA scale (about four tenths of a standard deviation) or about one year's worth of education. Also, on average across OECD countries, 13% of the differences in student performance within each country are associated with differences in students' socioeconomic background.

The Education Act (1998) provides a legislative definition of educational disadvantage for educators and policy makers in Ireland to work with. However, it is acknowledged that defining social marginalisation in education is an immensely complex issue, with many perspectives. Downes and Gilligan (2007) consider the many conceptualisations of social marginalisation in education and they recognise that no single insight will provide a complete answer to this issue. Yet they are optimistic that 'what is socially constructed can be changed' (p. 463). Also, Kellaghan (2001) observed that the definition of educational disadvantage provided in the Education Act (1998) is broad and provides little guidance in terms of identifying and addressing the 'impediments' which might 'prevent students from deriving appropriate benefit from education.' He notes, that the 'key to understanding disadvantage and to addressing problems associated with it, might lie precisely in an explication of these impediments' (p. 4). He also comments that, frequently, distal indicators, such as income poverty, are used to operationalise the concept of social marginalisation in education and although such indicators may be useful in identifying children and young people living in conditions associated with social marginalisation, they provide little information on the types of problems that children may experience in school. Kellaghan suggests a definition of educational disadvantage that reflects both distal indicators and children's experiences in the school context.

1.1.1. Measuring social marginalisation in education

Kellaghan (2001) proposes that a child may be regarded as experiencing social marginalisation in education 'if because of factors in the child's environment conceptualised as economic, cultural and social capital, the competencies and dispositions which he/she brings to school differ from the competencies and dispositions which are valued in schools and which are required to facilitate adaptation to school and school learning' (p.5). This definition, unlike the definition outlined in the Education Act (1998), recognises the roles of cultural and social as well as economic capital. However, Kellaghan's definition could be criticised for placing too much focus on the child's experience in the school context, rather than emphasising the need for system level change to address the 'impediments' preventing benefit from education (Gilligan, 2002).

The constructs of cultural, economic and social capital mentioned in Kellaghan's definition are inspired by Bourdieu (1986). Bourdieu defines capital as '…accumulated labour (in its materialised form or its 'incorporated', embodied form) which, when appropriated on a private, i.e., exclusive basis by agents or groups of agents, enables them to appropriate social energy in the form of reified or living labour' (1986, p. 241). Children's success in school will depend on the amount and composition of different forms of capital and the extent to which these are valued by the dominant culture. While these three forms of capital can be considered separately, they are interrelated.

Economic capital relates to the material and financial resources that children's families have available to them, such as income and assets. It is assumed that homes with access to greater economic capital are better able to provide the supports required for the cognitive development of family members. As Kellaghan notes, 'families that are relatively poor will also be at a disadvantage relative to better-off families in their ability to purchase advantage for their children' (p.8). Furthermore, children living in conditions of poverty may not only have inadequate access to resources that support their cognitive development, but may also experience other factors such as hunger, malnutrition, and communities with high levels of crime, which may contribute to developmental problems.

Cultural capital includes cultural dispositions, cultural goods and educational credentials and is likely to be the form of capital most closely related to the cognitive competencies and dispositions involved in educational achievement (Kellaghan, 2001). Cultural capitals can exist in three forms: objectified (e.g., cultural goods such as pictures, books, computers, access to the Internet); institutionalised (e.g., educational qualifications held by parents) and embodied (e.g., personal dispositions acquired through the family socialisation, such as the value attached to education, educational expectations and aspirations). Bernstein (1971) and Bourdieu (1986) noted that language forms an important part of cultural capital and that differences in the use of linguistic codes can help to explain differences in achievement (i.e., children who can handle elaborated code are more disposed to perform better in the education system; Caro, Sandoval-Hernandez & Ludtke, 2014). Many factors that are cited in the context of social marginalisation in education, such as parent's occupation, their level of education and parental expectations for children, can be considered to be cultural capital. Kellaghan (2001) notes that while the focus in the provision of cultural capital is on the family, extra-familial sources become increasingly important as children mature.

Social capital is represented by the relationships among the family members that enhance the transmission of other structural resources such as parent's education (Caro et al., 2014). Social capital is embodied in relationships between individuals and therefore is less tangible than other forms of capital and it is defined primarily by its function, which is the 'ability of individuals to secure benefits by virtue of their membership of networks (Kellaghan, 2001; p. 10). According to Bourdieu (2005), social capital is the sum of the actual and potential resources to which an individual has access to through membership of organisation and social networks and can be provided by children's family members and other social relations (Behtoui & Neergard, 2016).

Capital has become a favoured way of thinking about socioeconomic status in the social sciences as access to economic, cultural and social capital are readily connectible to processes that directly affect well-being (Bradly & Corwyn, 2002). These three forms of capital may be considered to be interrelated, for example, a parent's level of education will have a direct impact on the type of employment, and thus the amount of income available to parents; parental income will likely determine the location of the child's neighbourhood and school, and will also directly impact on the social and economic resources that are available to the child; and occupation status may partially determine one's social network (Sirin, 2005). The extent to which composite measures of socioeconomic status take account of various forms of capital differs across different studies, as does the specific measures of the individual indicators that form the composites.

Many measures of socioeconomic status only partially map onto the concepts of economic, cultural and social capital. Indeed, many measures rely on three variables as indicators of socioeconomic status: parental income, parental education and parental occupation (Sirin, 2005). Not only do such measures not explicitly take account of social capital, but provide limited measures of economic and cultural capital. In more recent times, other variables have also been included with measures of parental education, income and occupation to provide a more nuanced definition of socioeconomic status, especially in the field of education. For example, one of the largest surveys of educational achievement, PISA, uses an index of Economic, Social and Cultural Status (ESCS) which combines information on parents occupation (using the international socioeconomic index of occupation status of the father or mother, whichever is higher); the level of education of the father or mother (whichever is higher) converted to years of schooling; the home educational resources available to a student (whether they have a desk at which they study at home, a quiet place to study, computer for school work and educational software); their material possessions or family wealth (including whether students have their own bedroom, an MP3 player, laptop or tablet computer, as well as the number of televisions, cars and bathrooms at their home); their cultural possessions (including classic literature, books of poetry, books on art, music or design and musical instruments); and an estimate of the number of books in each students home. However, while the PISA measure of ESCS refers to the three forms of capital outlined in Kellaghan's definition, no direct measure of the relationships among family members that enhance the transmission of other resources is included. Also PISA's measure of cultural capital can be considered to be limited to objectified and institutionalised cultural capital and PISA does not collect a direct measure of income, instead access to relevant household items is used as a proxy for wealth.

Many large scale assessments such as PISA, TIMSS and PIRLS have continuously found an association between indicators of socioeconomic status and academic achievement and such studies have made significant contributions to the study of educational inequality. However, the indicators used to operationalise socioeconomic status vary considerably from one study to another. Caro et al. (2014) argue that such studies simply 'operationalise' concepts such as socioeconomic status with 'a battery of items' (p. 434) and that the concept of socioeconomic status in these studies lacks solid theoretical meaning. They note that simply 'fishing for correlations' between particular constructs and student outcomes, without any consideration of theory to explain why such relationships between variables may be expected oversimplifies the complex nature of educational systems. This has implications for researchers and policy makers who use such large scale studies as a basis to explore social marginalisation in education.

While there is a general consensus that socioeconomic status is better represented by a composite of variables, there is no consensus as to which combination of indicators would best represent socioeconomic status; how to best measure each indicator; and whether it is best to examine relations between socioeconomic status and child outcomes using each indicator singly or a composite of all indicators together (Bradley & Corwyn, 2002). However, as Caro et al. (2014) note, using measures and methods that are not informed by theory will provide knowledge about the factors related to student achievement but little about the mechanisms through with success at school can be achieved. It is only through considering the processes and pathways associated with individual indicators that we can truly understand the relationship between socioeconomic status and school success.

1.1.2. Economic, social and cultural capital and their relationships with academic attainment in Ireland

A number of national and international studies have examined associations between variables that can be considered indicators of economic, cultural or social capital and academic achievement in Ireland. One of the most enduring findings in studies of achievement in Ireland is that children from poorer families are outperformed by those from better-off families. As already discussed, PISA (which measures achievement among 15-year-olds in over 70 countries) includes a number of variables to measure what it calls 'Economic, Social and Cultural status' and each of these variables have been found to be significantly, although only moderately or weakly, associated with achievement in Ireland (Shiel, Kelleher, McKeon & Denner, 2016). When considered separately, the strongest correlation was between achievement and the number of books in a student's home (r=.333); followed by parental occupation (r=.311); cultural possessions (r=.251), parental education (r=.236) and home educational resources (r=.183). The weakest relationship was between family wealth and achievement (*r*=.063). The relationship with achievement was strongest when each of these indicators were combined into a composite measure (*r*=.356).

Similar findings have been noted at primary level in Ireland. Children whose parents had completed a University Degree or Postgraduate Degree (including a Master's or Doctorate) achieved the highest reading and mathematics scores, while those whose parents left education after primary school had the lowest scores (Kavanagh, Shiel, Gilleece & Kiniry, 2015). Also, children who had no parent employed, who came from lone-parent households, whose family had access to a medical card and whose parents described their families as poor or very poor performed significantly less well on assessments of reading and mathematics. On the other hand, children who had access to books (either at home or through library membership) had significantly higher reading and mathematics achievement scores, as did those who had access to educational games, electronic books, broadband Internet, a quiet place to do homework and reference books. Also, children whose parents expect them to do well in reading and mathematics had higher achievement scores.

Even among children considered to be at risk of social marginalisation, differences are observed in the various forms of capital. In 2003, the Educational Research Centre conducted a study of reading standards in primary schools designated as disadvantaged under the Disadvantaged Area Scheme (DAS)[1]. The purpose of this study (known as the Literacy Study) was to obtain baseline data on the reading achievement of pupils in First, Third and Sixth classes in a representative sample of schools designated as disadvantaged; identify variables associated with the reading achievement of the pupils in these schools; and to make recommendations that would facilitate reaching the target of halving the proportion of pupils with serious literacy difficulties in primary schools designated as disadvantaged by 2006. Overall, almost 6,500 pupils in First, Third and Sixth classes in 94 schools were assessed (Eivers, Shiel & Shortt, 2004).

The achievement results from this study confirmed that students in schools designated as disadvantaged were performing well below the national average. The percentage of very low

[1] The Designated Area Scheme (DAS) was introduced in 1984 to address the social marginalisation in selected schools. Selected schools were identified using a number of economic indicators. More information is presented in section 1.2.

achieving students (i.e. those who qualify for learning support) was also considerably higher than at standardisation – 27% of pupils of First and Sixth class pupils, and 30% of Third class pupils achieved scores at or below the 10th percentile, compared to 10% at each class level in the standardisation sample. Furthermore, there were very few high achieving students in the Literacy Survey – just 4% of pupils at First class and 3% in both Third and Sixth classes achieved scores at or above the 90th percentile (compared to 10% in the Standardisation Study). The magnitude of the difference in achievement between pupils in the literacy survey and standardization samples was constant across class levels, contradicting previous findings (Weir, 2001) that the achievement gap increases with grade level. This study also found that parental unemployment, medical card possession and having a parent who left school without any qualification were all associated with lower achievement scores, indicating that even within schools designated as disadvantaged factors related to the socioeconomic status of individual students play a considerable role in achievement.

A hierarchical multilevel model of reading literacy for Third class pupils was developed as part of the Literacy Study to identify the simultaneous contributions to achievement of school- and pupil-level variables. The final model included one school-level variable (a composite index measuring social marginalisation in a school, referred to in this study as the 'school deprivation index', that includes the proportion of pupils covered by the medical card scheme, in receipt of a grant for books, in the highest ISEI[2] category and with at least one early school leaver parent) and a number of class/pupil-level variables, including attendance, the number of books in the home, the frequency of being read to at home before formal schooling, medical card possession and number of siblings. Two interactions were observed in the model: one between the composite measure of social marginalisation and pupil gender and one between reading before formal schooling and attendance at school.

In that study, the composite measure of social marginalisation accounted for variation in reading achievement beyond that explained by individual socioeconomic status and other class- and pupil-level variables in the model, indicating a social context effect in some schools designated as disadvantaged, i.e., the concentration of social marginalisation in a school was

[2] The ISEI (International Socio-Economic Index) is a scale of occupational status (Ganzeboom, DeGraaf, Treiman, & DeLeeuw1992).

significantly related to achievement. Also, boys in the schools with the highest concentrations of social marginalisation were found to be particularly at risk, achieving a mean reading score one-third of a standard deviation below girls in similar schools. The model also confirmed the importance of reading to children at home before the start of formal schooling. The model indicates that pupils with low attendance who were 'hardly ever or never' read to before formal schooling achieve scores over two-fifths of a standard deviation lower than those with low attendance who were read to at home every day before schooling began. Medical card possession was found to be a stronger predictor of achievement than pupil-level socioeconomic status (based on parent occupation). Adjusting for other relevant school- and pupil-level variables, pupils from families with a medical card scored one-fifth of a standard deviation lower than their counterparts from families without a medical card. Also, the number of books in a pupil's home was found to be associated with achievement, such that pupils with more books in the home had higher scores than pupils with few or no books.

These findings indicated that measures of economic, social and cultural capital are independently associated with achievement outcomes, but the relationship is strongest when indicators of the three forms of capital are combined. Even within schools with high concentrations of children at risk of poverty, variations in social and cultural capital are observed to be associated with achievement outcomes.

1.2. Addressing social marginalisation in education in Ireland

The concept of social marginalisation in education has received much attention from researchers and policy makers in Ireland over the last few decades and Ireland was one of the first European countries to respond to the problem of social marginalisation in education with the establishment of a preschool in an area with high levels of poverty in 1969 (Weir, 2016). The first mainstream measures to deal with social marginalisation in education were introduced in 1984 through the Disadvantaged Area Scheme (DAS). The DAS, which was introduced to selected primary schools, used specific indicators to identify schools that would be considered for inclusion in the scheme. Schools provided estimates of the number of pupils whose families were resident in local authority housing or non-permanent accommodation; held medical cards; and were in receipt of unemployment benefit or assistance under schemes administered by the Department of Social Welfare, all of which can be used as proxies for family income. The existing pupil-teacher ratio in the school was also taken account of (Weir & Archer, 2005). Similar indicators were used at post-primary level with the addition of educational indicators (the percentage of students with significant literacy and numeracy difficulties, the percentage of students who drop out of school at or about 15 years of age and examination score based on the performance of students on the Junior Certificate examination). Participation in some other primary level schemes aimed at addressing social marginalisation in education (such as Early Start, the Support Teacher Project and the Home School Community Liaison scheme) was confined to schools already in the DAS and thus subject to the same selection criteria.

Two initiatives that followed on from the DAS (Breaking the Cycle and Giving Children an Even Break) used many of the same indicators of social marginalisation but also included a number of other variables such as the percentage of pupils from lone parent households, whose parents had no educational qualifications, who were in receipt of the grant for free books and who were receiving support for low farm income (Weir & Archer, 2005). While these schemes have tended to be positively evaluated by those directly involved in them, Weir (2016) notes that there is very little evidence that these initiatives had any impact on achievement as measured by standardised tests. However, as Downes (2007) argues, focusing only on such measures may downplay other background factors, which may hinder the intervention, but which may have greater relevance to the needs of the target group.

The most recent initiative provided by the Department of Education and Skills aimed at addressing the needs of students at risk of social marginalisation at both primary and post-primary level is the School Support System (SSP) under DEIS. In 2005, schools with the highest level of social marginalisation nationwide were identified and selected for inclusion in the initiative. Primary schools were considered for inclusion in this initiative based on estimates of socioeconomic and demographic indicators (the percentage of pupils whose families were in receipt of the grant for free books, were unemployed, were resident in local authority accommodation, were lone parent families, were from large families or were from the Travelling Community). At post-primary level, schools were considered for inclusion based on socioeconomic (the percentage of students from families with medical cards) and educational indicators (Junior Cycle retention rates, Senior Cycle retention rates and Junior Certificate Examination performance). In 2017, the selection process for DEIS was revised using the HP Deprivation Index (Haas & Pratschke, 2012) which is based around three dimensions of 'affluence/disadvantage': demographic profile, social class composition and labour market situation. Indicators of these dimensions include population change, age dependency ratio, lone parent ratio, primary education only, third level education and employment status.

Under the SSP, existing interventions for schools with concentrated levels of social marginalisation were unified (Department of Education & Science, 2005). Urban schools are divided into two bands, with schools in Band 1 having higher assessed levels of social marginalisation than those in Band 2. Schools in both bands have access to the following supports:

- Reduced class sizes and additional staffing;
- Additional funding;
- Access to the School Meals Programme;
- Access to literacy and numeracy support services and programmes including Reading Recovery; First Steps; Maths Recovery; Ready, Set, Go Maths; and homework clubs/summer camps assisting literacy and numeracy;
- Access to a Home/School/Community Liaison (HSCL) service which includes parents and families in literacy and numeracy initiatives;
- Access to academic and non-academic support which include after-school homework clubs and holiday supports developed through the School Completion Programme;
- Access to transfer programmes supporting progression from primary to second-level;
- Access to planning support and professional development supports.

As well as revising the selection process for DEIS, a new DEIS action plan (Department of Education and Skills, 2017) was published which replaces the action plan launched in 2005. This plan outlines new targets for literacy and numeracy rates in DEIS schools, as well as increased emphasis on student wellbeing and progression to further and higher education. In particular the new plan aims to increase the reach of the Incredible Years Teacher Programme (a classroom-based programme designed to reduce conduct problems and promote pro-social behaviour) and the Friends Programme (a programme designed to help children manage all kinds of emotional distress), as well as offering greater prioritisation of services provided by the National Educational Psychological Service (NEPS) in DEIS schools. The plan also aims to introduce a new pilot approach to encourage schools to work collaboratively in developing teaching and learning practices to improve educational outcomes.

An evaluation of the SSP at both primary and second-level began in 2007, the first phase of which had a particular focus on reading and mathematics achievement in urban SSP schools between 2007 and 2013 (Weir, 2016). The evaluation has found that while the average reading and mathematics scores of students in Second, Third and Sixth class were well below the national average in 2007, 2010 and 2013 the average reading and mathematics score achieved by pupils in each of these grade levels increased between 2007 and 2010 and again between 2010 and 2013. Improvements were greatest at the lower grade levels, with the largest gains observed among pupils in Second class and the smallest at Sixth class. At each grade level, the percentages of pupils with very low scores (at or below the 10th percentile) reduced significantly between 2007 and 2013, although the decrease was most pronounced among Second class pupils (Weir, 2016) and there were very slight increases in the percentage of high scoring (at or above the 90th percentile) pupils in reading and mathematics. Improvements are more marked among pupils in Band 1 schools than those in Band 2.

Small but statistically significant increases in reading and mathematics were also observed among the subsamples of pupils in the longitudinal cohorts (i.e., Second and Third class pupils tested in 2010 were followed-up when they were in Fifth and Sixth class in 2013). There is clear evidence that significant progress has been made in terms of literacy and numeracy in SSP schools, however it is not clear at this stage what elements of the SSP, or indeed other factors, have played a significant role in bringing about these improvements.

Across all these initiatives, economic factors were the primary indicators used for identification of children experiencing social marginalisation in education and common among all these initiatives is the use of the percentage of children from families with medical cards as a measure of social marginalisation (with the exception of the selection of primary schools for DEIS, where an estimate of the number of children from families with a medical card was not used due to low response rates). Although the possession of a medical card is not synonymous with poverty, the vast majority of families with school-going children that hold medical cards do so because of low income (Sofroniou, Archer & Weir, 2004). Also, previous studies have shown a strong association between individual achievement and family possession of medical card (Kavanagh et al., 2015; Eivers et al, 2004). Furthermore, Sofroniou et al. (2004) found that the concentration of students from families with medical cards in a school appears to have an effect on achievement over and above the effect of individual medical card status. They also noted that achievement declines as the percentage of students with medical cards in the school increases. The Literacy study also found that even within schools designated as disadvantaged, students whose families do not have a medical card performed significantly better on the assessment of reading literacy compared to those whose families do have access to a medical card (Eivers et al., 2004). The observed difference was similar to levels found in the national assessments (approximately half a standard deviation). Therefore, it appears that medical card possession is a strong and consistent predictor of social marginalisation in education in Ireland.

The focus of these initiatives has been on improving academic performance among children at risk and there has been little recognition that not all children attending these schools are performing poorly. While there has been greater emphasis on improving outcomes among higher achieving children in recent times, approaches to tackling social marginalisation in education in Ireland have not focused on exploring factors that contribute to more resilient outcomes among at-risk children.

1.3. Resilience and social marginalisation in education

Historically, most studies exploring development in 'at-risk' individuals have tried to identify children who had maladaptive behaviour, identify the factors associated with maladaptive behaviour and concentrate resources on these children to compensate for any 'disadvantage' that these children may have experienced. However, in all studies of risk experiences huge variation has been found in children's responses. As Rutter (1979) notes, even in the cases of the most severe stressors and adversities, it is unusual for more than half of the children to develop significant psychopathology.

Indeed, despite overwhelming evidence of the relationship between social marginalisation and lower educational attainment, not all students at risk of poverty perform poorly in school. For example, while the Literacy Study (Eivers et al., 2004) found very low proportions of high achieving students in schools designated as disadvantaged compared to the national average, between 3% and 4% of students in this study obtained scores at or above the 90th percentile. Similarly, despite the significant positive correlations that were found between a school's socioeconomic enrolment and achievement in the 2009 National Assessments of Reading and Mathematics, some schools were found to be atypical (Eivers et al., 2010). That is, some schools with considerable concentrations of children experiencing social marginalisation performed better than other schools with comparable enrolment compositions. Furthermore, results from the DEIS evaluation provide positive indications that schools with higher concentrations of children experiencing social marginalisation and who have poor achievement results can improve their achievement levels over time. Examining these schools and students can offer a valuable insight into how students can go on to succeed in school despite challenging socioeconomic conditions.

The emergence of evidence of positive developmental outcomes despite the experience of adversity in different contexts (e.g., Anthony, 1974; Garmezy, 1974; Rutter, 1981; Werner, Bierman, & French, 1971) brought about a shift in emphasis in studies exploring the causes and course of development in individuals experiencing adversity. The emergence of resilience research in the 1970's shifted the focus away from a deficit or disease model towards a focus on adaptive outcomes (Schoon, 2006). The shift towards focusing on positive outcomes also has consequences for social policy 'aiming to create opportunities for development and to promote the chance of positive chain reactions' (Schoon, 2006; p7). Indeed, the National Forum Action Plan (Gilligan, 2002), among others, has questioned approaches that operate out of a belief that a 'lack in the individual experiencing disadvantage, their family and/or community' needs to be made up by 'compensating for this deficit' (p. 143).

More resilient students have been defined as those 'who come from a disadvantaged socioeconomic background and perform much higher than would be predicted by their background' (OECD, 2010, p62). Results from PISA 2015 indicate that in Ireland 29% of students who have scores at the lower end of the scale of economic, social and cultural capital are considered to be demonstrating greater levels of academic resilience, which is the same as the average across OECD countries. According to the OECD (2016), to identify these students, first the overall relationship between performance and socioeconomic background is established and then the actual performance of each 'disadvantaged' student is compared with the performance of students from similar socioeconomic backgrounds. It should be noted that, in PISA, 'disadvantage' is defined in relative (i.e., the bottom third of a scale of economic, social and cultural status within a country) and not absolute terms and there is little consideration given to cultural differences in definitions of 'disadvantage'. Also, while the OECD identifies the proportion of students they consider to be demonstrating greater levels of academic resilience in each country that participates in PISA, little attempt is made to understand the processes or cultural differences that may contribute to more resilient outcomes among these students.

1.4. Sociocultural context

To be able to comprehensively understand individual development, the individual and their immediate context needs to be considered in the wider sociohistorical context. As Schoon (2006) notes 'societal circumstances beyond the control of the individual, such as economic depression or the outbreak of war, contribute considerably to the development of potential' (p.34). The current study draws on data collected from waves one and two from the child cohort of the Growing Up in Ireland (GUI) study. Children who were selected to take part in the child cohort of GUI were first surveyed at age nine in 2008 (wave one), with additional follow up at age 13 (wave two, in 2011 and 2012), and age 17/18 (wave three, in 2015 and 2016).

In the years before the first wave of data collection for Growing Up in Ireland, Ireland experienced strong economic growth and poverty fell from 19.4% to 15.8% (over the three year period to end-2007). Nevertheless, 5.1% of the population were experiencing consistent poverty (i.e., were below the poverty line and experiencing deprivation in at least two areas, such as an inability to replace worn-out furniture, a lack of heating, unable to afford a meal out with friends/family or a brief trip away from home) (CORI Justice, 2009). However, between the first and second wave of data collection, Ireland experienced one of the most severe economic downturns of OECD countries. The increase in child poverty was the highest among all EU countries from 2008 to 2011 (Lopez Vilaplana, 2011). As a result of the recession, GDP growth fell from 5% in 2007 to 0.2% in 2012 and unemployment rose from 4% in the mid-2000s to 15% in 2012 (Watson, Maitre, Whelan & Williams, 2014). Research by Social Justice Ireland (2013) found that Ireland's poorest 10% took the biggest hit since the start of the recession, losing 18.4% of their disposable income compared to 11.4% of the richest 10%. Whelan and Maitre (2014) found that the proportion of the population considered to be economically vulnerable increased from an average of 16% pre-recession (2004-2008) to an average of 26% after the start of the recession (2009-2011). Analysis of the GUI data found a sharp increase in the percentage of families experiencing some or great difficulty making ends meet, from 7% at wave one to 23% at wave two, and 61% of families indicated that they had been affected by the recession to a significant degree (including a reduction in wages and social welfare, and having to cut back on basics) (Growing Up in Ireland, 2012).

These findings point towards considerable changes in the lives of children in Ireland between 2008 and 2012, in particular in the lives of children experiencing or at risk of poverty. Many of those who were experiencing or at risk of poverty before the economic recession are likely to have experienced a considerable worsening of their circumstances, while it is also likely that many families entered into the poverty bracket for the first time as a result of the economic crises. Persistent and transient poverty have been found to have different impacts on child development (Watson et al, 2014; McLoyd, 1998) and the processes associated with more resilient outcomes may differ depending on the persistence and timing of poverty.

Also, as Schoon (2006) found, the link between poverty and individual attainment can differ depending on the sociocultural context. In her study of academic resilience, Schoon (2006) noted that those born in 1970 appeared relatively more affected by the experience of growing up in conditions of social marginalisation compared to those born in 1958. She suggests that 'in times of generally improved material circumstances the lack of basic household amenities or overcrowding in the family home appears to have a relatively greater negative impact, suggesting situational variability in the influence of risk conditions' (p. 142). Schoon also noted that changing labour market opportunities were reflected in changing aspirations regarding educational and occupational plans for the future.

It should also be noted that definitions of positive adjustment can also be culturally determined, as well as age-dependent. Masten (1994) argues that defining positive outcomes requires judgements about appropriate responses that meet societal expectations. While academic outcomes may not be the most relevant measures for some samples of children (Downes, 2007), academic attainment is becoming increasingly important in western culture. In Ireland, the *National Strategy to Improve Literacy and Numeracy among Children and Young People* (Department of Education and Skills, 2011; 2017a) has not only issued targets for decreasing the proportion of children performing at lower levels on standardised assessments of reading and mathematics, but has also set targets for increasing the proportion of children performing at the highest levels on these assessments. New targets have also been published for children attending schools in receipt of the School Support Programme under DEIS, underlining the emphasis the Irish education system places on improved academic achievement among all children (Department of Education and Skills, 2017a).

1.5. Conclusions

Countless studies, both internationally and in Ireland, have demonstrated that students whose families are experiencing poverty perform significantly less well in school. Parental unemployment, lower levels of parental education, medical card possession, lack of educational resources, family dysfunction, and lower levels of parental and pupil engagement with education and expectations for school attainment are all associated with poorer performance among students. Furthermore, there is also evidence of a social context effect, in that a number of studies have noted that achievement declines as the concentration of students experiencing social marginalisation in a school increases.

Historically, many research studies and policy initiatives aimed at addressing social marginalisation in education have focused primarily on indicators of economic capital. As Kellaghan (2001) and others (Downes & Gilligan, 2007) have noted, a broader definition of educational disadvantage is needed to fully understand the impediments that prevent students from receiving benefit from education. Furthermore, Caro et al. (2014) argue that to understand the mechanisms through which success at school can be achieved, socioeconomic status, as it is conceptualised in studies of education, requires a solid theoretical meaning. While many measures of socioeconomic status used in studies only partially map onto the concepts of economic, cultural and social capital, where such indicators are included they have been found to be independently associated with achievement outcomes.

Success or failure in school can have serious long-term individual and social consequences and in particular, academic attainment is becoming increasingly important in western culture. In this thesis, by focusing on students who succeed in school despite the presence of adverse conditions researchers can identify factors and processes associated with positive school outcomes and policy makers can develop interventions aimed at closing the achievement gap between students who are academically successful and those who are at risk of poorer performance. The next chapter explores the concept of resilience in greater detail, outlining some of the conceptual and methodological considerations in resilience research.

Particular attention is given to the concept in the context of education and details of the current study are outlined.

Chapter 2. Resilience

Chapter 1 discussed social marginalisation in education, including issues around measurement of the concept and the associations between economic, social and cultural capital and school outcomes. The concept of resilience, in particular in the context of education, was also introduced. The phenomenon of resilience has become more and more popular in recent times both as a research topic and an area of policy interest. This chapter explores the concept of resilience in greater detail and highlights many of the conceptual and methodological issues that have arisen throughout its development. This chapter also provides an overview of risk and protective factors, as well as the different models of resilience that have been outlined in the research literature. Theoretical considerations in resilience research are presented, followed by the introduction of the concept of resilience as an active process. Different approaches to the study of resilience are also outlined. The latter part of this chapter outlines the concept of resilience in the context of education and describes the many factors that are associated with academic and educational resilience. Finally, an overview of the current study is provided.

2.1. Conceptualising resilience

The concept of resilience first emerged in the mid-20th century when it was observed that not all children who were considered to be at risk of maladaptive development went on to display maladaptive behaviour. Since then, the concept has grown in popularity as demonstrated by the number of scientific publications on the topic but also the breadth of at-risk circumstances examined. Despite the large volume of scientific publications there is no one commonly-used definition of resilience and definitions vary widely depending on the context of the studies. For example, Gilligan (2001) defines resilience as ‘the healing potential that may lie naturally within children in their normal daily experience or their social networks’ (p. 181), while Luthar, Cicchetti & Becker (2000) define resilience as “a dynamic process encompassing positive adaptation within the context of significant adversity” (p.543). Others have taken a broader view of resilience, describing it as ‘a process, capacity or outcome of successful adaptation despite challenges or threatening circumstances’ (Masten, Best, & Garmezy, 1990, p.426). Even within studies definitions can vary. For example, the above definition provided by Masten, Best and Garmezy was the definition used in the Project Competence Longitudinal Study in 1990.

However, by 2011 the definition used in this study changed somewhat to define resilience as 'the capacity of a dynamic system to withstand or recover from significant threats to its stability, viability or development' (Masten, 2011, p. 494). The latter definition broadens the understanding of the concept and recognises that resilience is a process that can occur across a number of spheres or systems in the child's life.

2.1.1. Expressions of resilience

Certainly, the breadth of contexts and 'at-risk' situations to which resilience can be applied and the different ways in which resilience can be thought to manifest has contributed to the diversity in definitions. Varying definitions in the literature reflect the different ways in which resilience can be expressed. For example, Wolin and Wolin (1993) define resilience as the 'capacity to bounce back, to withstand hardship, and to repair yourself', indicating that positive adaptation is a return to the same state as before the experience of adversity. On the other hand, Richardson, Neiger, Jensen and Kumpfer (1990) define resilience as 'the process of coping with disruptive, stressful, or challenging life events in a way that provides the individual with additional protective and coping skills than prior to the disruption that results from the event.' This definition views the individual as being better off than before the experience of adversity, i.e., adversity challenged the individual (or system) in some way to find strength that might not have otherwise been discovered. Waxman, Gray and Padron (2003) took another point of view and suggested that resilience refers to 'those factors and processes that limit negative behaviours associated with stress and result in adaptive outcomes even in the presence of adversity'. Such definitions view individuals demonstrating greater levels of resilience as being able to reduce, or buffer, the negative impact of stress therefore resulting in a less adverse experience. Kaplan (1999) took this view of resilience one step further by suggesting that the very experience of risk might be prevented by the characteristics that make a person or system more resilient. While this viewpoint would be difficult to test, the fact that many individuals demonstrating greater levels of resilience (i.e. those who manifest positive adaptation despite experiencing adversity) display several of the same characteristics as similarly competent individuals who have not experienced adversity suggests that it is a possibility.

In general, the concept has been used to describe three major categories of phenomena in the psychological literature. The first class refers to studies examining good recovery from trauma. A traumatic experience, by definition, is expected to overwhelm coping resources and therefore reduce the quality of functioning. The second group describes high-risk individuals who show better than expected outcomes (i.e. those who 'overcome the odds'). Studies of such individuals attempt to identify the predictors of good outcomes in high risk groups. The third group of resilience phenomena refers to positive adaption despite the occurrence of challenging experiences. These studies examine the general effects of acute or chronic major life stressors, such as divorce, on child behaviour, and the moderators that seem to enhance or reduce the effects of adversity (Masten, 1994). Resilience in these studies implies effective coping, i.e., restoring or maintaining internal or external equilibrium by means of human activities, including thought and action, while experiencing significant threat.

There is likely to be much commonality in the pathways to resilience across these three categories. For example, individuals from high-risk groups are likely to encounter many stressful situations by virtue of the fact that they belong to a high-risk category, and may develop adaptive techniques that allow them to withstand the stressful experiences or to develop strengths that result in better than expected outcomes. Indeed, studies across these three forms of resilience have yielded similar findings, which may point towards universal human capacities and protective factors (Masten, Best & Garemzy, 1990).

Masten and Narayan (2012) have provided illustrations of the different pathways of resilience under conditions of acute and chronic adversity (figures 2.1 and 2.2). Dashed paths illustrate forms of resilience, whereas solid lines indicate maladaptive pathways. Figure 2.1 illustrates pathways of adaptive functioning before and after an acute-onset traumatic experience. In this figure, path A illustrates stress-resistance, path B demonstrates disturbance with recovery and path C illustrates post-traumatic growth. On the other hand, path D demonstrates breakdown without recovery and path E illustrates delayed breakdown without recovery. Figure 2.2 illustrates pathways of adaptive functioning before and after exposure to prolonged and severe adversity. In this figure, paths F and G demonstrate decline in the context of chronic adversity and recovery after good conditions are established or restored, while path H illustrates decline with no sign of recovery (Masten & Narayan, 2012).

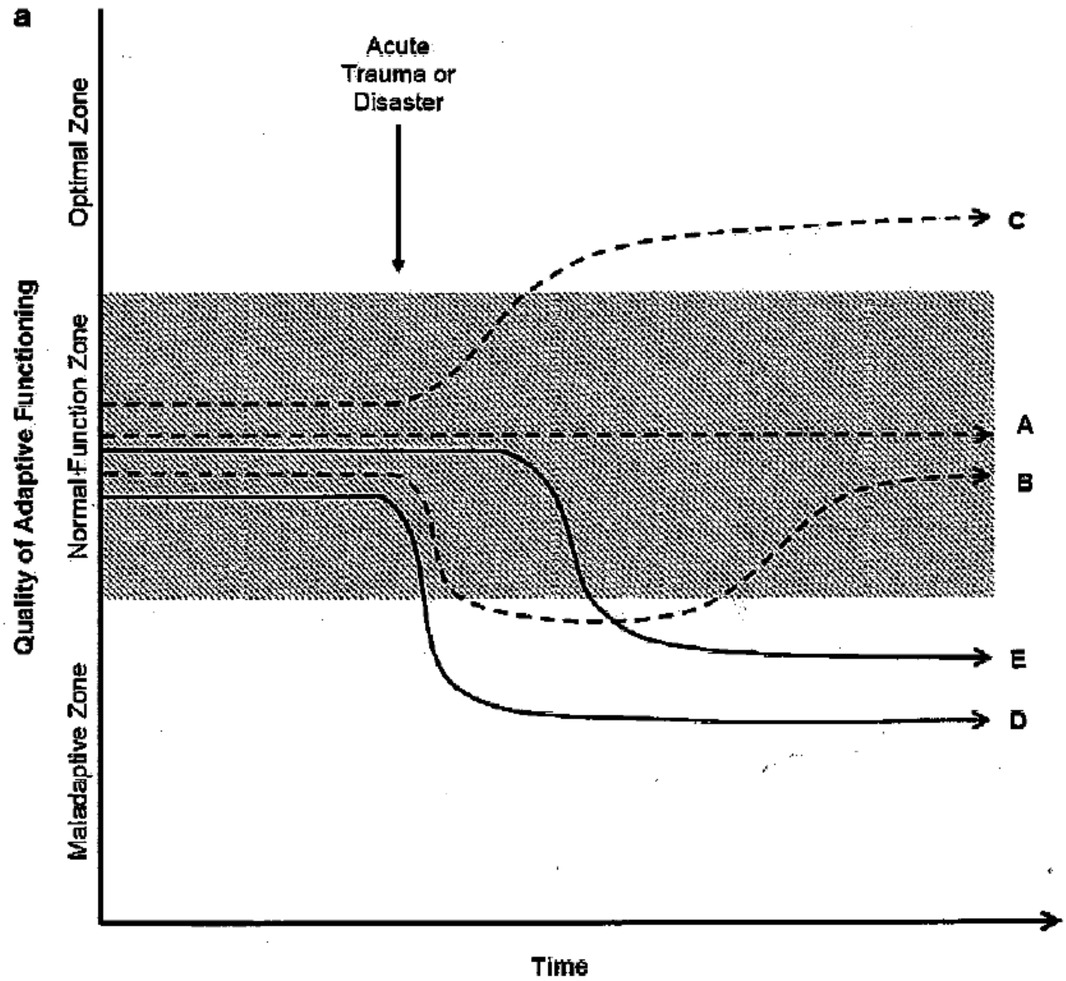

Figure 2.1: Examples of pathways of adaptive functioning before and after an acute-onset traumatic experience (source: Masten & Narayan, 2012).

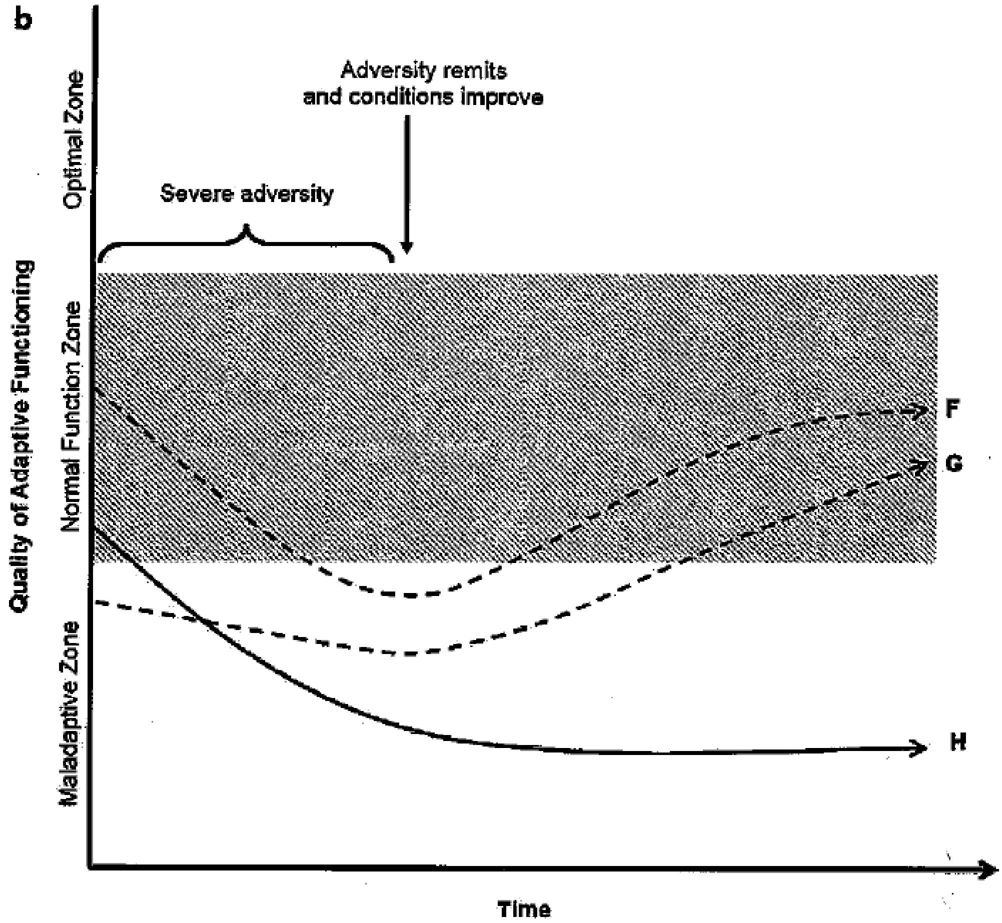

Figure 2.2: Examples of pathways of adaptive functioning before and after exposure to prolonged and severe adversity (source: Masten & Narayan, 2012).

It is likely that no one pathway will apply exclusively to any particular experience of adversity. As such, these pathway models can be a useful means of considering the ways in which resilience may be expressed. However, they do not provide any insight into the associations between factors related to resilience that may change particular behaviour patterns or the specific conditions that may contribute to resilience, an understanding of which is lacking in resilience research.

2.1.2. Locus of resilience and stability over time

The wide variation of definitions of resilience in the literature may also reflect a change in the understanding of this concept over time. One such change concerns perspectives on the 'locus' of resilience. Early studies of resilience concentrated on identifying personal qualities of more resilient children, and describes these children as hardy, invulnerable and invincible, implying that resilience is a general characteristic that a person may or may not possess that moderates the effect of risk factors on outcomes. Such conceptualisations of resilience can carry connotations of a personality trait and can create a perception that individuals are personally responsible for their own problems and do not have the capacity to overcome adversity (Masten, 1994; Schoon, 2006). As the field of research on resilience evolved researchers began to acknowledge that more resilient adaptation may often come from factors external to the child.

One problem that has arisen in the resilience literature is that some researchers have used the term interchangeably to refer to both a personality trait and a dynamic process. In such cases, it is difficult to determine which of the two definitions is intended by the researcher and this ambiguity causes difficulties in interpreting the operationalisation of resilience. Where resilience is viewed as a personal trait exposure to adversity is not presupposed. On the other hand, where resilience is viewed as a dynamic process, adversity, by definition, must have been experienced. As it is generally agreed that descriptions of resilience take account of overcoming some kind of challenge, stress or adversity (Luthar et al., 2000; Rigsby, 1994), it seems implicit that resilience involves a process between the individual and their environment.

Another issue which raises concerns about conceptualising resilience as a personality trait is the recognition that resilience may not be consistent across domains (i.e. individuals may be deemed to be outwardly successful in their lives as expressed in employment or income but these 'resilient' individuals may also suffer deep on-going personal trauma) and resilience may change over time (i.e., a child who was not deemed to be more resilient in a particular domain may in fact display resilience in that domain at a later point in life, or vice versa) (Kaplan, 1999; Canavan, 2008). For example, a study examining children with histories of maltreatment, found that almost two-thirds were more academically resilient, yet only 21% manifested resilience in the domain of social competence (Kaufman, Cook, Arny, Jones & Pittinsky, 1994). Other studies have shown that among adolescents who experienced significant adversities, those who overtly reflect successful adaptation often struggle with covert psychological difficulties, such as problems with depression and posttraumatic stress disorder (Luthar, 1991; Luthar, Doernberger & Zigler, 1993; O'Dougherty-Wright, Masten, Northwood & Hubbard, 1997). For example, Zucker, Wong, Puttler & Fitzgerald (2003) found that children of alcoholics who showed little behavioural disturbance as preschoolers tended to continue to show little disturbance several years later. However, these more resilient children came to show internalising symptoms at levels as high as those children who had been identified as the most troubled as preschoolers. Luthar et al. (2000), argue that the recognition of the changing nature of resilience can provide opportunities to further explore the dynamic nature of resilience.

The recognition that resilience can differ across domains and time further feeds into the notion of resilience as a dynamic process. More than that though, it suggests that adaptation can be thought of as a distribution of developmental outcomes and that resilience is at the positive end of that distribution among individuals at high risk (Rutter, 1987, 1990). If resilience is considered an active process that can change over time then it follows that the factors and processes associated with resilience are also likely to change over time. So, the factors that contribute to resilience in early childhood may be different to those that contribute to resilience in later childhood or adolescence. Findings that the resilience status of individuals may change over time may be due to children experiencing protective factors that are salient at one developmental time point, but not another. For example, a parent reading to their child may be a protective factor associated with resilience in early childhood, but the same parent may be less effective at communicating with their child's school, which may be a more salient protective factor in later childhood or adolescence. Few studies examine how resilience can change over time and those that do tend to focus on identifying resilience at a particular time point, identifying the factors associated resilience at that time point and then describing how those factors vary over time but not how the association between these factors and resilience may change.

In one such study, Schoon et al. (2006) measured how children's psychological adjustment (measured in the form of conduct disorder, hyperactivity and emotional problems) changed over time and how the variation in psychological adjustment differed for children by resilience status. Children in this study were identified as more resilient at age five (for the 1970 cohort) or age seven (for the 1958 cohort) and their psychological adjustment was measured at ages five, 10 and 16 for the 1970 cohort and ages seven, 11 and 16 for the 1958 cohort. However, the association between psychological adjustment and resilience was not examined at the various ages levels for each cohort, therefore it is unclear as to whether these aspects of psychological adjustment hold the same associations with resilience status across different developmental time points.

2.1.3. Differentiating resilience from other constructs

Another key concern with the disparity in the terminology used to define resilience is whether researchers are dealing with the same entity or with other similar meaning concepts such as coping (Kaplan, 1999; Waxman, Gray & Padron, 2003). A number of researchers have observed that there are a multitude of constructs that are related to or appear functionally equivalent to resilience, such as invulnerability, hardiness, adaptation, adjustment, mastery, plasticity, person-environment fit, or social buffering (Losel, Bliesner & Koferl, 1989; Kaplan, 1999).

Although few studies provide guidance about how resilience can be distinguished from other factors, Rutter (1985) has attempted to identify the several features believed to be central to the concept of resilience. The first factor that Rutter outlines as being central to the concept of resilience is that in order for resilience to exist a person must have been exposed to adverse situations and risk. He argues that people who are more resilient are able to manipulate their environments to protect themselves from the negative consequences of adverse events, and thus views resilience as an active process. Avoiding a stressful situation or negative event does not constitute resilience as no active process is involved. Therefore, resilience differs from coping in this sense, in that a person can cope with situations by avoiding them (Gruen, Folkman & Lazarus, 1988; Lazarus, DeLongis, Folkman & Gruen, 1985; Lazarus & Folkman, 1987). Luthar (2006) echoes this sentiment when comparing resilience to the constructs of competence and ego-resiliency. She notes that while resilience presupposes risk, both competence and ego-resiliency do not. As a result, resilience includes both negative and positive adjustment indices (i.e., absence of disorder and presence of health), while competence refers mostly to positive adjustment indices.

Rutter also notes that previous experience plays a role in the development of the skills and strategies that are required to be more resilient (i.e., previous exposure to a particular adverse situation may make a person better able to deal with similar situations later in life) again highlighting the notion of resilience as an active process. In contrast, coping style provides only a general description of how people usually deal with situations and less emphasis is placed upon how these generalised strategies might have developed to start with. Similarly, ego-resiliency is described as a personality trait and as such no active process is involved (Luthar, 2006).

A third factor that Rutter identified as central to the concept of resilience is that risk and protective factors can vary in importance over time. For example, while a low birth weight would be considered a risk for a new born baby; lower weight is usually associated with health benefits in later life. Finally, Rutter notes that certain factors can function as both risk and protective factors, depending on the context – a risk behaviour might actually remove the child from the potentially hazardous situation (e.g. running away from home) (Harvey & Delfabbro, 2004).

While variations in the definitions of resilience used across studies creates problems in drawing comparisons in the results from different studies, Luthar et al. (2000) argue that such discrepancies do not invalidate the study of the concept. Rather, they suggest that researchers should be specific in characterising the domains in which resilience is being explored.

2.1.4. Resilience as an active process

As noted earlier, resilience is defined by both exposure to adversity and the manifestation of successful outcomes despite risk exposure. As such, resilience is considered an interactive concept. Also, resilience research has its origins in the recognition that there is huge variation in individuals' responses to environmental hazards (Rutter, 2012), indicating that an understanding of the interaction between an individual and their environment is needed to fully comprehend the concept. Thus, resilience can be considered a dynamic process in which the individual and the environment in which they live influence each other and therefore are constantly adapting and changing (Downes, 2017a).

Rutter (1987) provided one of the first discussions on the importance of recognizing processes in resilience and he drew attention to a particular class of protective processes – those with interactive components. For example, he noted that being female was considered 'protective' as it was found that boys reacted more severely to family discord than girls did. Also, having a supportive spouse was more strongly related to good parenting among ex-institutionalised women than comparison mothers. Rutter also outlined a range of ways through which risk effects can be reduced, for example: by altering the experience of risk itself (e.g. preparing a child before hospitalisation); by altering exposure to the risk (e.g., via strict parental supervision in high-risk environments); by averting negative chain reactions (which serve to perpetuate risk effects, as harsh discipline perpetuates oppositionality); by raising self-esteem (through secure relationships and tasks well done); and through turning points or opportunities (such as entry into army service) (Rutter, 1987).

While more recent definitions emphasise resilience as a dynamic process (Masten, 2015, Fergus & Zimmerman, 2005), few studies examine the processes and pathways that contribute to more resilient outcomes. Instead, many focus on identifying discreet factors associated with these outcomes. As Luthar (2006) notes, 'if studies are truly to be informative to interventions they must move beyond simply identifying variables linked with competence to explain the specific underlying processes' (p. 748). Also, while many resilience researchers have emphasised the interaction between individuals and their environments (Rutter, 2006; Luthar & Borwn, 2007; Masten, 2006, 2009; Downes, 2017a), adaptation is generally associated with an individual's successful coping under stress rather than the degree to which the individual's environment enables development (Ungar, Ghazinour & Richter, 2013).

Many resilience researchers stress the importance of considering dynamic person-environment interactions when conceptualising resilience. However, few resilience studies examine the complex interaction across systems but instead focus on the interaction between discreet variables and the outcome of interest. Due to the many potential interactions, as well as the complex nature of such interactions, studies that have attempted to explore resilience as a dynamic process across systems tend to focus on just two or three such systems.

For example, Vanderbilt-Adriance and Shaw (2006) examined the relationship between child protection factors (measured by IQ and emotion regulation), family protection factors (measured by the quality of the parent-child relationship; maternal nurturance and marital quality) and neighbourhood risk on child adjustment (measured using a composite of self-reports of anti-social behaviour and mother and teacher reports of social skills) at 11 and 12 years of age. They found that child IQ, nurturing parenting, and marital quality were all associated with positive child adjustment and that these protective qualities acted similarly across level of neighbourhood risk. Child-parent relationships were also positively associated with child-adjustment, however the quality of parent-child relationships appeared to be more strongly related to positive outcomes in the context of lower rather than higher levels of neighbourhood risk.

Schoon (2006) also examined the influence of factors from different environments on children's resilience using data from two British cohort studies: the 1958 National Child Development Study (NCDS) and the 1970 British Cohort Study (BCS70). Hierarchical regression analyses were conducted to test the impact of socioeconomic adversity on academic attainment in early childhood and to test whether resource factors can counter-balance the influence of social risk on academic adjustment. Resource factors included child indices (specifically, gender, emotional stability, fewer conduct problems and lower levels of hyperactivity), family indices (parents read to their child and parents met with teacher) and social integration in the community indices (family have not moved and the child meets other children). Analyses were conducted using data from when the children were five years old (BCS70) and seven years old (NCDS).

Some similarities and differences were found among the two cohorts. Among the seven-year-old children, the findings indicated that boys were more susceptible to the risks associated with socioeconomic adversity than girls, while no gender differences were apparent among the five-year-old children. Also, emotional stability emerged as a vulnerability factor among the high-risk seven-year-olds, but had no significant effect among the five-year-old children, while a lower level of hyperactivity was found to be a general promotive factor in both cohorts. Parent-child interaction and parental involvement in their child's education were also found to be protective factors among both cohorts, although parental involvement was only significant among the high-risk group at age seven. How these factors relate to each other was not examined though and such insights may be useful for informing social policy.

Schoon notes that these findings suggest that 'academic resilience depends on age context-specific factors that provide protection against specific risks for children in specific life contexts' (2006; p. 91). However, as the two cohorts measured child outcomes at different ages and time periods, it is difficult to estimate to what extent differences between the two cohorts are reflective of age differences or sociohistorical differences. Schoon's assertion that resilience depends on age specific factors is interesting and suggests that the factors and processes associated with resilience may differ at different developmental time points. As noted earlier, while Schoon's study explores this issue by examining how particular variables that are related to resilience may vary over time, she does not examine how the particular associations between these variables and resilience may change over time.

These two studies illustrate the roles that different environments can play in the development of more resilient outcomes, in particular the association between attributes of the child, their families and wider community and resilience, and how these environments can interact with each other to modify the relationship between risk and child outcomes. However, with the exception of the frequency with which parents met with teachers in Schoon's study, the relationship between children's schooling and resilience was not examined in either study. In Schoon's study, which assesses academic resilience, it could be argued that the association between the school environment and resilience is particularly relevant and an examination of how aspects of the child's schooling interact with other factors from the child's family and wider community life as well as personal attributes of the child could provide useful information to inform policies aimed at tackling social marginalisation in education.

2.2. Risk, positive adjustment and protective factors

As noted earlier in this chapter, resilience is a two dimensional construct defined by exposure to adversity and the manifestation of successful adaptation in the face of that risk (Schoon, 2006). The identification of resilience is based on value judgements about 'differences between expected and observed outcomes, as well as the causes of success and failure' (Schoon, 2006, p. 8). Therefore, careful consideration needs to be given to identifying both risk and positive outcomes in resilience research, as well as the factors that may modify the relationship between these variables.

2.2.1. Identifying risk

As Luthar and Cicchetti (2000) note, risk or adversity can comprise genetic, psychological, environmental or socioeconomic factors that are associated with an increased probability of maladjustment. As resilience assumes exposure to risk or adversity, any investigation of resilience must determine if all individuals in a given study have experienced comparable levels of adversity. Otherwise, there is a danger that some well-functioning individuals may be identified as more resilient when in fact they may actually have faced low proximal risk (Luthar et al., 2000; Rutter, 2000). Many resilience studies treat a particular index as reflecting adversity if it shows significant statistical associations with child maladjustment. However, risks describe probabilities and not certainties and questions remain about the specific life circumstances of different individuals in a particular sample, i.e., have all individuals experienced the same, or similar, levels of risk? As Richters and Weintraub (1990) note, social class has been widely used as a risk indicator, although it provides little information about the specific experiences to which children in a particular social class are exposed, i.e., a child raised by working class parents will not necessarily experience poor quality care giving (Schoon, 2006).

Luthar et al. (2000) use the example of offspring of mothers addicted to cocaine. Sixty-five percent of such children have been found to have a major psychiatric disorder (Luthar, Cushing, Merikangas & Rounsaville, 1998), with 35% considered to be free from a psychiatric disorder. While this 35% of children might be seen as more 'resilient' it is possible that their family settings were relatively healthy as a result of high support from extended family (e.g. Rutter, 1990). Indeed, reflecting on Kellaghan's (2001) definition of educational disadvantage, high levels of school achievement among children from poorer socioeconomic backgrounds may be reflective of differences in social and cultural capital and therefore these children could be considered as experiencing different levels of risk. Such considerations have led to questions as to whether all children in apparently high risk contexts are really at risk or alternatively, whether some well-functioning children may not be demonstrating resilience at all but may actually have faced low proximal risk. However, Luthar et al. (2000) argue that this is exactly what the search for protective factors is about – the location of a set of processes that differentiate a substantial proportion of the healthy children from the maladjusted children – and they suggest that, in these cases, the label 'resilient' may be more appropriate for protective families rather than the healthy individuals within them.

Another related concern is subjective perceptions of risk in resilience research, i.e., the fact that the meaning of a particular adverse event to the individual experiencing it may differ substantially from that of the resilience researcher. Concerns about subjective ratings, however, are not unique to studies of resilience (Downes & Gilligan, 2007). Also, Luthar et al. (2000) argue that, rather than this being a problem with resilience research; it may instead offer researchers the opportunity to examine protective processes that lead some individuals to perceive a specific event as relatively neutral while others view it as harmful.

2.2.2. Positive adjustment

Definitions of resilience usually classify an individual as more resilient if they function within normal boundaries on measures of behavioural, social or intellectual functioning (Harvey &

Delfabbro, 2004). However, difficulties arise in the identification of a critical level of normal functioning, e.g. IQ scores are highly predictive of scholastic performance but do not necessarily predict variations in psychological functioning or occupational success in general. Luthar et al. (2000) argue that the choice between excellent versus average levels of functioning should be conceptually guided by the risk studied. They suggest that when the stressor refers to severe or catastrophic events the maintenance of near-average functioning should be enough. On the other hand, when risks experienced are in the more moderate range, researchers may require evidence of superior functioning in conceptually important domains to justify labels of resilience. Using more stringent definitions, involving high levels of functioning may be useful in a research context, where identification of the most prominent factors is preferred.

Some researchers have also raised concerns about the stability of the research findings from studies that rely on stringent definitions of adversity and competence, as studies involving individuals who are at one extreme on the adversity continuum (high adversity) and at one extreme on the competence continuum (high competence) tend to involve smaller numbers and as a result they are almost always unstable (Luthar et al., 2000). On the other hand, if less stringent criteria are used than the proportion of individuals perceived to be more resilient could be quite considerable. In fact, Luthar et al. have suggested that it may be more appropriate to use less stringent criteria when dealing with extremely harsh life adversities. These researchers also argue that just because resilience studies often involve a low frequency of occurrence, this does not negate the value of studying the phenomena and they highlight that many scientific studies focus on groups that are small in size (e.g. autism, physical abuse, schizophrenia, etc.).

Concern has also been expressed about definitions of resilience that emphasise behavioural success at the expense of other important aspects of a person’s functioning, e.g., a child exposed to economic hardship may show good academic performance but at the same time may experience behavioural problems (Luthar, 1991). However, this unevenness in functioning does not necessarily invalidate resilience as a concept. In fact, some have argued that it is unrealistic to expect any group of individuals to exhibit consistently positive or negative adjustment across multiple domains that are conceptually unrelated, for even the paths of ‘normally’ developing children do not reflect a uniform progression of diverse cognitive, behavioural and emotional capacities (Luthar et al., 2000). Others have suggested that it would be beneficial to assess multiple domains of development so as to provide a broader picture of adaptation (Cicchetti & Garmezy, 1993). Luthar et al. (2000) have suggested that in order to provide clarity to the issue researchers should be specific in characterising the domains in which resilience is being explored and that decisions on how outcomes should be assessed (i.e. should outcomes be examined separately or somehow integrated) should be based on the conceptual distinctness of the domains in question.

Schoon (2006) notes that the outcomes used to define resilience change as a function of age and can vary across contexts and cultures. However, few studies explore how the processes associated with resilience may vary as a function of age. Studies examining resilience throughout the life-course generally focus on variations in outcomes used to define resilience or the factors associated with it, but do not explore how the pathways towards resilience may change throughout the life course. If resilience is considered a dynamic process between an individual and their environment, and if the interactions between an individual and their environment can be thought to change as a function of development, it follows that the pathways to resilience will likely change as an individual develops.

2.2.3. Protective factors

Many studies of resilience have focused on identifying factors that play a role in modifying the negative effects of adverse life circumstances. Such factors are referred to as protective factors. Masten (2001) has noted that results from across various resilience studies point towards a relatively small set of global factors associated with resilience and that the consistency of these resources in resilience research suggests that fundamental human adaptive systems are at work. Masten describes these ordinary adaptive processes as 'ordinary magic'. Three sets of factors are now commonly cited as being implicated in the development of resilience: attributes of the children themselves, aspects of their families and characteristics of the wider social environment (Luthar, 2006; Kelly, Fitzgerald & Dooley, 2017).

Schoon (2006) suggests that this triarchic set of factors can be understood as psychosocial resources that support or promote adaptive development. Kellaghan (2001), in his definition of educational disadvantage, suggested that the absence of economic, social and cultural capital creates a discontinuity between the competencies that a child has developed and those valued by the education system and therefore such absence of capital can be construed as a risk factor. On the other hand, the presence of various forms of capital may be considered as protective. However, it should be noted that the effects between variables and outcomes are not always linear and in many cases, variables might show their effect more strongly at one end of the dimension, or effects where both high and low levels of a factor carry risk (Schoon, 2006).

Three general models of resilience that explain how promotive factors operate to alter the trajectory from risk exposure to negative outcome have been identified in the literature: compensatory, protective and challenge (Fergus & Zimmerman, 2005). A compensatory model describes the process through which a promotive factor counteracts a risk factor and is illustrated in Model 1 in Figure 2.3. This model involves a direct effect of a promotive factor, which is in the opposite direction of, and is independent of, the effect of a risk factor (Fergus & Zimmerman, 2005).

A protective model of resilience refers to the processes through which promotive factors (such as assets or resources) moderate or reduce the negative effects of a risk on an outcome (Model 2 in Figure 2.3). In this model, promotive factors are called protective factors to distinguish them from promotive factors that only compensate for risk exposure. Protective factors differ from compensatory factors by modifying the effects of risks in an interactive fashion (Zimmerman, Stoddard, Eisman, Caldwell, Aiyer & Miller, 2013). Protective factors may operate in several ways to influence outcomes. For example, in a protective-stabilising model (Model 3 in Figure 2.3) a protective factor helps to neutralise the effects of risk, while in a protective-reactive model (Model 4 in Figure 2.3) a protective factor diminishes but does not completely remove the expected effect of risk on outcome.

The third model of resilience is the challenge model (Model 5, Figure 2.3), in which the association between a risk factor and an outcome is curvilinear, i.e., exposure to high and low levels of a factor are associated with negative outcomes, but moderate levels of risk are related to less negative outcomes. An important consideration in the challenge model is that low levels of risk exposure may be beneficial because it can deliver an opportunity to practice skills and use resources and the individual can learn from the process of overcoming risk. In such models, the risk and promotive factors are the same variable, it is the level of exposure that alters the outcome. Where exposure to low levels of risk is continued or repeated over a longer term, such models can be considered as inoculation (Model 6, Figure 2.3). According to such models, children who overcome low levels of risk, are better prepared to face increasing risk (Fergus & Zimmerman, 2005).

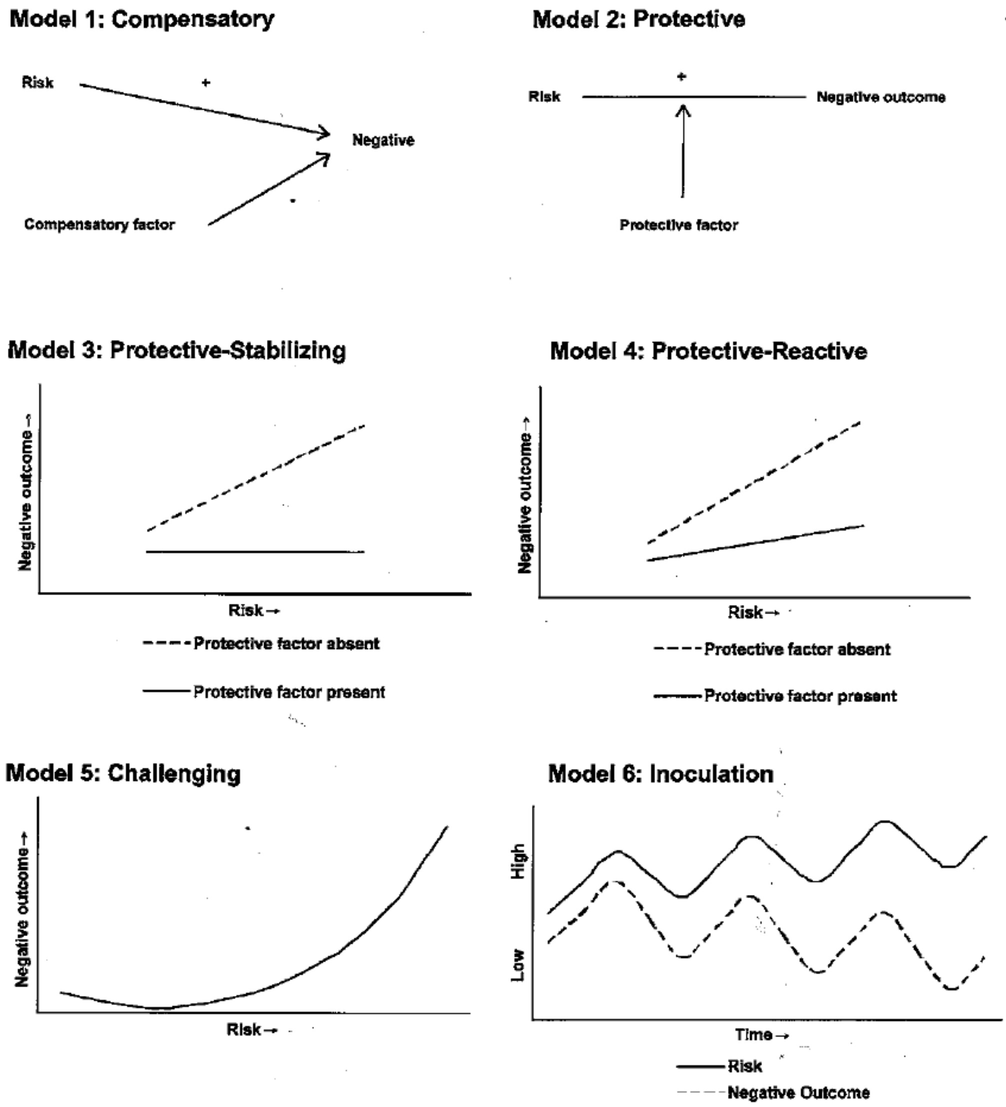

Figure 2.3: Examples of models illustrating the relationship between adversity, adaptive behaviour and factors that may promote or protect adaptive behaviour (source: Fergus & Zimmerman, 2005).

Such models are useful when considering the effects of particular protective factors on outcomes. However, they do not tell us how protective factors may work together or interact to contribute to resilience. As Schoon, (2006) states, 'resilience is a relative phenomenon, depending on complex interactions between constitutional factors and life circumstances. What is needed is a better understanding of the person-environment interactions, the underlying mechansims and processes that enable individuals to develop and maintain psychosocial resources despite the experiences of adversity' (p. 15).

2.3. Theoretical framework

While much of the literature on resilience emphasises the role of a multitude of contexts in developing resilience, Ungar, et al. (2013) argue that it is the individual who has remained the focus of our attention rather than both the environment and the individual. Unger et al., note that in studies of populations exposed to high levels of adversity with few supports, environmental factors were generally more influential than individual characteristics in accounting for positive developmental outcomes. Ungar (2012), along with others (e.g., Sroufe, Egeland, Carlson & Collins, 2005; Downes, 2017a), argue that a definition of resilience that acknowledges individual/environment interactions is needed and that both the quality of the interaction between the individual and their environment as well as the capability of each to provide what is necessary to sustain well-being should be assessed. This view of resilience is compatible with Bronfenbrenner's bioecological model of child development (Bronfenbrenner & Morris; 1998), which hypothesises that outcomes are shaped by the interaction of genetic, biological, psychological and sociological factors in the context of environmental support. This theory was inspired by the 'awareness of the resilience, versatility, and promise of the species Homo sapiens as evidenced by its capacity to adapt to, tolerate and especially create the ecologies in which it lives an grows' (Bronfenbrenner, 1979, p. xiii). An operational research design that permits an investigation of the bioecological theory is referred to as a *Process-Person-Context-Time* model (Bronfenbrenner & Morris, 1998).

According to this theory, 'human development takes place through *processes* of progressively more complex reciprocal interaction between an active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate external environment' (Bronfenbrenner & Morris, 1998, p. 996). These interactions are referred to as proximal processes. According to Bronfenbrenner & Evans (2000), a proximal process involves:

> A transfer of energy between the developing human being and the persons, objects, and symbols in the immediate environment. The transfer may be in either direction or both; that is, from the developing person to features of the environment, from features of the environment to the developing person, or in both directions, separately or simultaneously (p. 118).

According to Bronfenbrenner & Morris (1998), proximal processes are the primary engines of development and the 'form, power, content, and direction of the proximal processes effecting development vary systematically as a joint function of the characteristics of the developing person; of the environment – both immediate and more remote – in which the processes are taking place; the nature of the developmental outcomes under consideration; and the social continuities and changes occurring over time through the life course and the historical period during which the person has lived' (Bronfenbrenner & Morris, 1998, p. 996).

Bronfenbrenner acknowledged the *personal* characteristics that individuals bring with them to any social situation and he divided these into three types of characteristics: demand, resource and force characteristics. Demand characteristics are those that invite or discourage immediate reactions from the social environment, such as gender, age or skin colour. Resource characteristics are those that 'constitute biopsychological liabilities and assets that influence the capacity of the organism to engage effectively in proximal processes' (Bronfenbrenner & Morris, 1998, p. 1011) and can include mental and emotional resources (such as intelligence) as well as social and material resources (such as access to caring parents and educational opportunities). Finally, force characteristics are behavioural dispositions and temperament, such as motivation and persistence, that can set proximal processes in motion.

According to the bioecological model of development, when studying development we must look not only at the child and his/her immediate environment, but also at the interaction of the larger environment or *context* as well. Although it has been noted that Bronfenbrenner never focused exclusively on contextual factors in his theory-related writings (Tudge, Mokrova, Hatfield & Karnik, 2009; Tudge, 2016), his later writings have emphasised the active role of individuals in changing their context to a greater extent (Downes, 2014). This model identifies five environmental systems which impact on the development of a child (see Figure 2.4): the microsystem (i.e., the immediate surroundings of the individual, including the person's family, peers, school, and neighbourhood); the mesosystem (i.e. the connections between the different microsystems); the exosystem (i.e. the connection between a social setting in which the individual does not have an active role and the individual's immediate context); and the macrosystem (i.e. the culture in which individuals live). The developing child is rooted within these many interrelated systems.

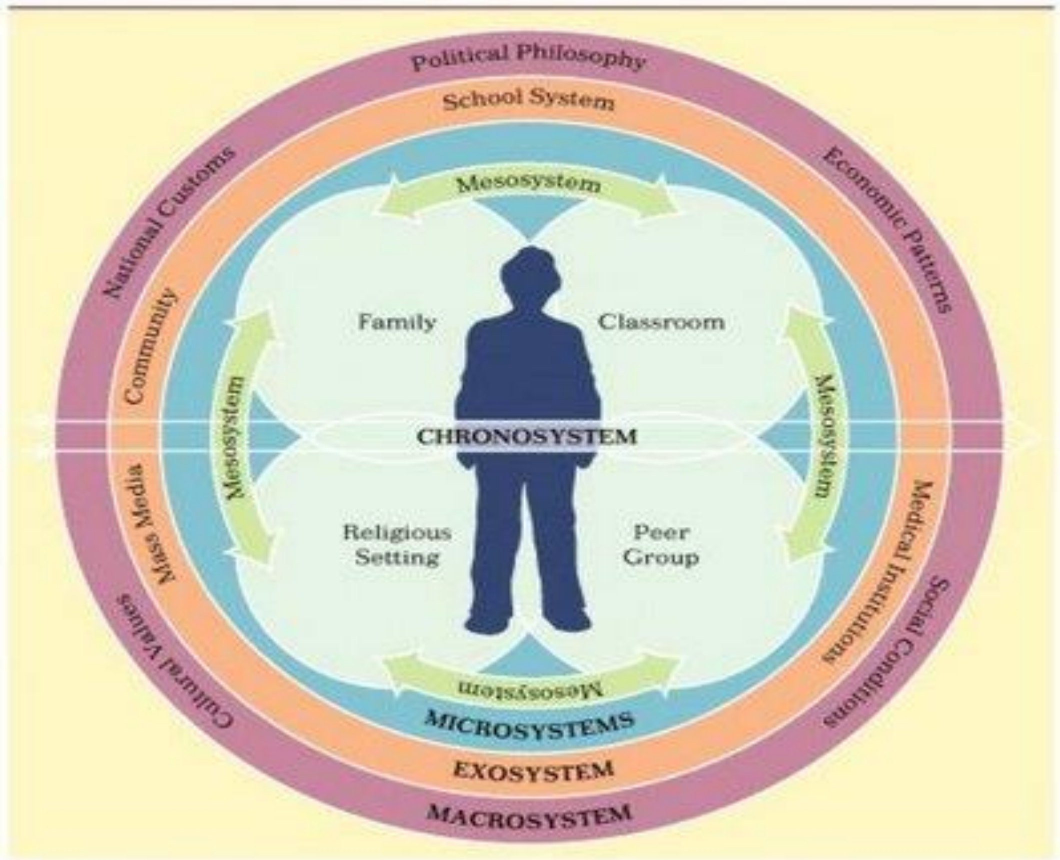

Figure 2.4: Bronfenbrenner's bio-ecological model of child development

The final element of the PPCT model is time; which according to the bioecological model constitutes micro-time (what occurs during the course of a specific activity), meso-time (the consistency of activities and interactions occurring in an individual's environment) and macro-time (the chronosystem or the pattern of environmental events and transitions over the life of an individual as well as sociohistorical circumstances) (Tudge et al., 2009). While Tudge et al., (2009) note that 'all aspects of the PPCT model can be thought of in terms of relative constancy and change' (p. 201), Downes (2014) argues that Bronfenbrenner's earlier writings 'tended to omit a dynamic focus' (p. 44) on time and system change over time and that the later addition of the chronosystem to Bronfenbrenner's writings only partially addresses these limitations.

It has been noted that while Bronfenbrenner's theory takes account of different contexts, it is the interactions between these contexts, the proximal processes that are central to his theory. However, many studies that claim to employ this theory have tended to focus primarily on contextual influences on development and thus have omitted proximal processes, as well as inadequately accounting for changes over time (Tudge et al., 2009; Tudge, 2016). Tudge et al. (2009) acknowledge that any study that includes every aspect of the bioecological theory would indeed be large and complex, and that researchers may choose to draw on specific concepts from the theory. They suggest that researchers should be explicit when stating which aspects of the theory they choose to apply in their research design and argue that any study that employs the bioecological theory should at the very least focus on assessing proximal processes.

Bronfenbrenner's model highlights the interactions between factors in children's maturing biology, their immediate family/community environment and the societal landscape which steers their development and as such, can provide a useful framework for understanding resilience. Just as genotypes are transformed into phenotypes through the interactions between an individual and their environment, so too are psychological characteristics, such as personality, influenced by environments which encourage behaviours that enhance development (Ungar et al., 2013). For example, a culture that values and promotes education (macrosytem) will invest in an effective school system (exosystem), which will shape the quality of the schools that children attend (microsystem), as well as the interactions between the school and other microsystems such as the child's family and religious communities (mesosystem). The impact of any life event on the developing child will be influenced on the child's stage of development and the historical context (chronosystem).

Much resilience research focuses on microsystemic proximal processes. For example, recent studies have shown that the school environment is very important in determining the level of social and emotional well-being of pupils, through fostering warm relationships, encouraging participation, and providing clarity about boundaries, rules and expectations (Greenberg et al., 2003; Weare & Gray, 2003; Zins, Weissberg, Wang & Walberg, 2004). On the other hand, there has been relatively little research in the area of resilience that examines meso-systemic interactions, although the potential interactions are numerous (Ungar et al, 2013). Ungar et al. note that 'studies that capture the complexity of systemic interations show that microsystemic processes tend to be less predictive of positive outcomes than the meso- and macrosystemic interaction that trigger individual responses' (2013; p. 357) and that 'changing the odds tacked against the individual' influences changes in outcomes to a greater extent than the capacity of individuals themselves to change.

2.4. Approaches to studying resilience

Resilience studies generally fall into one of two major approaches of resilience research – variable focused approaches and person focus approaches – and models have often been grouped by their focus. Person focused models involve identifying more resilient individuals or groups of individuals (e.g., high risk individuals who are performing better than expected on a particular measure) and comparing them with other individuals or groups considered to nto be demonstrating resilience (e.g. high risk individuals who do not perform better than expected) to determine what differentiates the more resilient individuals from other individuals (Luthar et al., 2000). Some person-focused studies examine the life course of more resilient individuals. The purpose of these studies is to attempt to capture naturally occurring patterns of adaptation.

On the other hand, studies which use the variable focused approach look for linkages among variables of interest, such as measures of risk or adversity, outcome, and potential qualities of the individual or environment that may compensate for or protect the individual from the negative impact of adversity. In these studies, resilience itself is rarely measured as a construct but is indirectly inferred, by examining vulnerability and protective factors that are linked with certain patterns of stress-competence associations (Luthar & Cushing, 1999). Variable focused approaches rely on either main effects models or those involving interaction effects (Luthar et al., 2000). Main effects in these models reflect the independent contribution of risks or assets or bipolar attributes to the course of the outcome criterion variable. However, as these are correlational studies, causality cannot be established (Masten, 2001). Models that examine interaction effects focus on how the effect of an asset or risk factor on a desired outcome is mediated, for example through effective parenting. Complications arise, however, with regard to the robustness of such interaction effects. While main effect associations can be relatively robust (with effect sizes of about 10%-20%) the effect sizes of interaction effects tend to be rather small (often 2%-5%). This has caused some researchers to caution against relying too much on using interaction effects to understand processes associated with resilience.

In resilience research, person-focused methods have been useful for identifying important factors for resilience and profiles that occur in real people, whereas variable-focused approaches are more appropriate for recognising the processes involved in establishing resilience. Some studies, however, use both approaches to obtain a greater understanding of resilience. For example, Buckner, Mezzacappa and Beardslee (2003) conducted a study examining competence outcomes in 155 children from very low-income families using five different measures of competence including overall adaptive functioning, behavioural competence, and levels of externalizing behaviours, depression and anxiety. In this study, both a variable-based and person-based approach was used in the analysis. The variable-based approach involved developing an overall competence score by converting scores on each of the five measures into *z* score values, adding them together and computing an average. Hierarchical regressions were then carried out to test the predictability of various protective factors on the continuous adaptation scores. For the person-based analyses, the authors identified a subgroup of more resilient children who had better than average adaptation scores (i.e. they scored high on the competence and adaptation measures and below clinically significant levels on the externalising behaviours, depression and anxiety measures). This group of children were then compared to a group of children who were considered to not be demonstrating resilience and who scored low on either the competence or adaptation measure and had a clinically significant score on either the externalising behaviours, depression and anxiety measures.

2.5. Resilience in education

Resilience research has grown rapidly in the last two decades and has moved towards examining specific constructs of resilience within different contexts. One such construct of resilience which is receiving much attention is educational resilience. Risk factors associated with academic difficulty or dropping out of school have been well established, including coming from a lower socioeconomic background; being part of a lone-parent family; or experiencing mental health/emotional difficulties or some form of trauma (Kavanagh et al., 2015; Joint Oireachtas Committee on Education and Skills, 2010; Downes, Maunsell & Ivers, 2006; Downes & Maunsell, 2007; Boldt, Devine, MacDevitt & Morgan, 1998). These risk factors are often accompanied by a set of risk behaviours, such as skipping school or classes, not paying attention to the teacher, or not completing required class work or homework, which can act as blocks to student learning. If a student from an at-risk background holds a positive self-view and engages in the positive forms of these behaviours, i.e., regularly attending school, participating in extracurricular activities, completing required school work, these may serve as protective mechanisms that improve a student's chances of school success in spite of being a member of a risk group (Finn & Rock, 1997).

Educational resilience is a relatively new research topic, however the number of studies examining this phenomenon has grown in recent years. As Martin and Marsh (2006) note, studies that deal with educational resilience tend to focus on ethnic minority groups and extreme underachievers (e.g. Finn & Rock, 1997), but all students may experience some form of adversity or challenge at some point therefore resilience is relevant to all students.

2.5.1. Definitions of resilience in education

Research on educational resilience experiences many of the same limitations as research on other forms of resilience. For example, the definition of resilience in the education literature varies widely, as do the definitions of protective factors, risk factors and the criteria for labelling individuals as more resilient or vulnerable. Also, the labels or terminology used differ between studies, with some referring to educational resilience and others using more specific terms such as academic resilience.

In general terms, educational resilience can be defined as 'the heightened likelihood of success in school and other life accomplishments despite environmental adversities brought about by early traits, conditions and experiences' (Wang, Haertel & Walberg, 1994, p.46). Alva's (1991) definition is more specific, describing more resilient students as those 'who sustain high levels of achievement, motivation and performance despite the presence of stressful events and conditions that place them at risk of doing poorly in school and ultimately dropping out of school' (Alva, 1991, p19). All definitions of educational resilience refer, on some level, to success in school, however, operational definitions of success in school differ between studies. Some studies define success in school in terms of academic achievement (e.g., OECD, 2011), while others focus on engagement in school when defining educational resilience (e.g., Cooper & Crosnoe, 2007). Other studies use a combination of academic and engagement measures when defining educational resilience (e.g., Alva, 1991; Finn & Rock, 1997). As with other forms of resilience, such discrepancies in the definitions of educational resilience do not invalidate the study of the concept, but rather can broaden our understanding of what constitutes successful functioning.

The criteria for defining 'risk' also differ between studies. For example, attending a school environment with high concentrations of children experiencing poverty could be considered an adverse condition (Waxman, 1992), but other risk factors such as drug abuse, sexual activity, coming from a single-parent home, having a sibling who has dropped out of school, may be as, or more, important to measure. Indeed, the number of risk factors experienced by students as well as the magnitude of these factors can also alter the risk experience. As noted earlier, questions as to whether all individuals considered to be 'at-risk' have experienced the same level of risk remain important in resilience research in the field of education, and can shed light on protective factors and processes that may contribute to more resilient outcomes.

Each approach for identifying more resilient students has its benefits and limitations. For example, some studies have used teacher nomination as the criterion for determining more resilient students. Teachers' expectations and attitudes toward the students are likely to influence their nomination and in turn may indirectly influence students' behaviour and outcomes. Furthermore, children's educational difficulties may lead to biases in teacher's ratings of behaviour (Rutter, 2000). On the other hand, teacher nominations may be a more valid method because teachers' decisions are typically based on a variety of indicators that are exhibited throughout the school year (Waxman, Gray & Padron, 2003). Other studies have used standardised assessments for measuring academic achievement. Using such measures raises concerns regarding validity or reliability. These studies often identify more resilient students based on one achievement test, which may or may not in fact represent students' overall academic achievement. Also, how educational resilience is defined using standardised tests can vary. Are more resilient students those who receive scores in top quartile or those who score at or above the 90th percentile, or somewhere in between? Luthar et al. (2000) have suggested that the criteria for successful functioning should be guided by the risk studied and that when stressors can be considered to be in the moderate range, evidence of exceptional functioning may be appropriate.

2.5.2. Academic resilience

As noted in the previous section, definitions of resilience in the field of education can vary substantially. Indeed, the study of educational resilience can be classified further into different forms of educational resilience. Academic resilience is one such form of educational resilience and is the focus of the current study. As the name suggests, the focus of academic resilience is on academic outcomes, usually but not restricted to performance on standardised tests of achievement.

As noted earlier, definitions of resilience vary across studies and even when studies use the same operational definition of the concept, differences in how resilience is measured can arise. This variation in the definitions used may be related to the expression of resilience being studied. As noted by Masten et al. (1999), three forms of resilience can be described: a positive outcome despite the experience of adversity; enhanced performance through the experience of adversity; and recovery after experience of significant adversity (i.e., bouncing back). Each of these forms of resilience can be applied to the field of academic resilience, although the operationalisation of each will differ. For example, the first two forms of resilience may be operationalised as better than expected results on a standardised assessment (OECD, 2011), or as achieving consistently high grades on school work throughout the school year (Waxman & Huang, 1996; Gonzalez & Padilla 1997) or both (Waxman, Huang & Wang, 1997). The third form of resilience may be operationalised as a considerable improvement in grades over a number of time points.

This last form of academic resilience (i.e., bouncing back) presupposes that knowledge of functioning before the experience of adversity, which may not always be available, is known. Also, as adversity can occur at different times for different individuals, being present from birth for some individuals and occurring later for others. Examining the differing roles of protective factors and developmental effects can therefore be difficult in such studies. Increases in performance over time among children experiencing persistent adversity from an early age could also be conceptualised as bouncing back (assuming that higher levels of performance would be present if adversity was absent). As it is likely that considerable changes in life circumstances would need to occur for such improvements to take place (given the persistent relationship between home background and achievement), such examination of resilience may be more relevant to evaluating interventions aimed at increasing achievement.

The current study focuses on examining high levels of performance among children experiencing economic adversity. Medical card status is used as the measure of economic adversity in this study and although it is not known at which point these children began experiencing poverty, it is likely that many of them have experienced persistent poverty since they were born. Also, information on academic performance is only available from age nine in the current study and previous functioning is not known. Therefore, the current study does not examine resilience as a ‘bouncing back’ to previous levels of functioning, but instead focuses on resilience as positive outcomes among those experiencing adversity (the first form of resilience). High performance is defined in terms of national averages and while it is acknowledged that those performing in the lowest percentiles may be making gains over time, this is not the focus of the current study.

While the number of studies examining educational resilience in general has grown in recent times, studies examining the specific construct of academic resilience are relatively rare. Two notable studies include an examination of students who outperform other students who have similar socioeconomic backgrounds using data from PISA 2006 (OECD, 2011) and Ingrid Schoon’s study of academic resilience using two nationally representative cohort studies in Britain (the 1958 National Child Development Study and the 1970 British Cohort Study), which are both discussed throughout this thesis. Similar to the current study, both of these studies examine better than expected academic achievement among children experiencing socioeconomic adversity, although they differ in terms of the measures and criteria used.

A number of limitations in these studies should be noted. For example, the study of academic resilience using data from PISA 2006, defines students as more resilient if their score on a measure of economic, social and cultural status is in the bottom third for all students in their country and their performance is in the top third internationally. Using relative measures to establish lower levels of socioeconomic status may be useful from a statistical perspective but offers little insight into the experience of children placed in such categories. Instead of using measures that are based on particular needs or experiences of individuals, using relative measures assumes that all children in such categories are experiencing poverty in the same way when that may not be the case. Studies that use such measures can offer little insight into how the risk experience may be reduced through protective factors.

On the other hand, Schoon’s study uses five indices to establish social risk (parent social class, home ownership, overcrowding, access to amenities and maternal education level), thereby creating a clearer illustration of social marginalisation in the risk index used. However, when examining factors associated with academic resilience, Schoon’s analysis is limited to examining correlates with achievement, rather than specifically examining factors associated with ‘better-than-expected performance’ (i.e., resilience). In this analysis, Schoon does not provide evidence that some children in the high-risk category are performing at much higher levels than would be expected given their socioeconomic status. It cannot be assumed that higher performance among this group of children constitutes resilience as many of these children may still be performing at lower levels when compared to national averages and therefore may still be considered vulnerable when compared to the general population.

Both studies tests regression models that aim to examine the relationships between protective factors and academic resilience. Various protective factors are identified in each study, including gender, psychological adjustment, engagement with parents and social integration in Schoon’s study, and students’ motivation to learn science, engage in science activities and courses, confidence in science and learning environment in PISA’s study of resilience. As Masen et al. (1990) note, three broad sets of variables have been found to be associated with resilience: aspects of the individual, their family and the wider social context. It could be argued that the school environment is a particular aspect of the wider social context that is important to consider in the context of academic resilience. As Schoon’s study examines academic resilience, it is notable that aspects of the school environment are not included the model of resilience in this study.

On the other hand, PISA’s examination of resilience is limited to aspects of the child’s personal attributes and their schooling that are specific to science, with no consideration given to elements of the child’s home life or other environments. Addressing elements of the various environments in which children develop in models of resilience is challenging due to the number of measures and participants that would be required. However, understanding the interrelationships between the various environments in which children develop, and how these processes can contribute towards resilience, is vital if policies aimed at tackling social marginalisation are to be effective.

Academic resilience is important from an educational policy point of view as policy makers, principals, teachers and parents need to understand why some students do well in school, while others from similar backgrounds, schools and home environments do not do well academically. Throughout the literature, academic resilience is viewed as an attribute that can be taught and promoted by focusing on the factors which impact on an individual’s success in school and which can be changed. By focusing on students who succeed in school despite the presence of adverse conditions policy makers can develop interventions aimed at closing the achievement gap between students who are academically successful and those who are at risk of doing poorly.

As Masten (1994) has noted, defining positive outcomes requires judgements about appropriate responses that meet societal expectations. Educational policy in Ireland has placed increasing emphasis on performance on standardised tests. Targets for decreasing the proportion of children performing at lower levels and increasing the proportion of children performing at the highest levels on standardised assessments of reading and mathematics form part of the *National Strategy to Improve Literacy and Numeracy among Children and Young People* (2011, 2017). A consistent and long-term finding in Irish educational research is that many children experiencing social marginalisation in education less well on such standardised assessments. However, significant minorities of children from such backgrounds have been found to perform at the highest levels on these assessment and can be considered to be demonstrating academic resilience. While academic resilience is only one form of resilience in an education context, it is related to other positive outcomes such as educational engagement and attainment.

2.5.3. Factors associated with academic and educational resilience

As with other forms of resilience, researchers have argued that a greater understanding of the processes associated with resilience in the educational context is needed (Schoon, 2006). A first step to understanding the processes associated with educational resilience is to identify which factors contribute to the outcomes of interest. As there are relatively few studies which examine academic resilience specifically, and as academic resilience and other forms of resilience in the field of education can be considered to be interrelated, this section focuses on factors which can be considered to be associated with academic resilience and educational resilience more generally.

A number of factors have consistently emerged as being associated with better outcomes in the educational resilience literature, including: relationships with family, teachers and peers; educational expectations; parental involvement in their child's education; engagement and meaningful participation; and personal attributes of the child; and gender.

These factors can also be conceptualised in terms of social and cultural capital. Social and cultural capital can be considered to be interrelated and many of these factors may be considered to contain elements of both forms of capital. For example, the child's relationships with family, teachers and peers may be thought of as social capital but can also be considered as embodied cultural capital as personal dispositions may be acquired through socialisation. Such relationships may influence and be influenced by children's personal dispositions. Similarly, educational expectations and parental involvement in their child's education can be considered as cultural capital, but parent's involvement in the form of communication with the child's school may also be considered as social capital. Children's engagement may be thought of as social capital as engagement in family, school and extra-curricular activities can provide socialisation experiences for the child.

2.5.3.1. Relationships with family, teachers and peers

In the literature on resilience, the importance of family cohesion and good parent-child relationships has been noted (Kelly, Fitzgerald & Dooley, 2017). Rutter (1990) conducted a review of data from a number of studies and found that secure childhood attachments protect against adversity in later life. Masten, Best and Garmezy (1990) noted that:

> parents provide information, learning opportunities, behavioural models and connections to other resources. When these transactional protective processes are absent or are severely limited for prolonged periods, a child may be significantly handicapped in subsequent adaptation by low self-esteem, inadequate information or social know-how, a disinclination to learn or interact with the world, and a distrust of people as resources (p438).

Nixon (2012) found that authoritarian parenting, and to a lesser extent, neglectful parenting were most strongly related to social and emotional difficulties among nine-year-old children in the GUI sample. Darling & Steinberg (1993) hypothesised that parenting style influences developmental outcomes primarily by moderating the effectiveness of specific parenting practices and by influencing children's openness to socialization. Investigating the extent to which adolescents' achievement strategies are associated with the parenting styles, Aunola, Stattin and Nurmi (2000) found that adolescents from authoritative families applied the most adaptive achievement strategies characterised by low levels of failure expectations, task irrelevant behaviour and passivity, and the use of self-enhancing attributions, whereas those from neglectful families deployed most maladaptive, task-avoidant strategies. The authors suggest that authoritative parents may provide more positive encouragement and competence-promoting feedback to their children which may support adolescents' autonomous behaviour, and that providing optimal challenges and opportunity to learn in an atmosphere of acceptance may foster adolescent's self-regulation and control beliefs while also boosting their self-esteem.

Other studies have revealed that while good parent-child relationships are an important factor in the lives of most children demonstrating greater levels of resilience, relationships with other salient adults, as well as with peers, can also play significant roles (Kelly, Fitzgerald & Dooley, 2017). For example, Wang, Haertal and Walberg (1995) noted that most children who demonstrate greater levels of resilience appear to have at least one strong, enduring relationship with an adult, but that this adult was not always a parent. Using the data from the Kauai study, Werner (2000) also found that a key feature of more resilient children was that each child had at least one person in their lives who accepted them unconditionally. Alva (1991) noted that students who maintained a high grade point average and who were from a low socioeconomic background reported higher levels of educational support from their teachers and friends. These students also experienced fewer family conflicts and difficulties. Such findings are corroborated by Gonzalez and Padilla (1997) and Nettles, Mucherach and Jones (2000) who found that more resilient students had more positive family, peer and teacher support.

Teachers can play an important role in educational resilience by bridging the gap between school experiences and family life. Also, teachers' sensitivity to student diversity and their ability to use a variety of instructional strategies and to adapt course content to provide learning experiences that are responsive to cultural and individual differences were important in promoting resilience in the classroom. Howard, Dryden and Johnson (1999) note that teachers in effective schools spend more time interacting with students and students express more positive perceptions about their schools overall. These students also reported being more satisfied with their school work and peer relationships (Wang et al., 1995). Martin and Dowson (2009), in their review of interpersonal relationships and student motivation and engagement, outlined a number of ways through which relationships with teachers can shape students' achievement motivation. They suggest that, according to expectancy-value theory, teachers' beliefs, attitudes and behaviours are communicated to students through their expectations and that high value and positive expectations enhance student motivation.

Commitment to education bonds students to teachers, to other students who value education, and to school in general. Therefore, poor academic performance threatens relationships as well as achievement (Cooper & Crosnoe, 2007; Crosnoe, Cavanagh & Elder, 2003; Steinberg, Brown & Dornbusch, 1996). The academic benefits of supportive relationships with teachers and school mentors are magnified for children at risk of poverty as these children tend to benefit more from the limited resources they do have (Cooper & Crosnoe, 2007).

Clark (1991) found that after the family, peers are the most important source of support as at-risk students benefit from opportunities to interact with students who have high achievement motivation, positive attitudes towards school, and a positive academic self-concept. Positive peer relationships are likely to promote school engagement through support of students' sense of fulfilment and the satisfaction of their need for belonging and relatedness. Liem and Martin (2011) suggest that ongoing positive social interactions with peers may lead children to internalise academic related beliefs, goals, values and expectations that are consistent with those of their peers. The impact of peer relationships may also differ for same-sex and opposite-sex peer relationships. For example, Liem and Martin (2011) found that same-sex peers, but not opposite-sex peers, directly predict academic performance, while both same-sex and opposite-sex peers predict general self-esteem and school engagement. Peer relationships were also found to have an indirect effect on academic and non-academic outcomes via school engagement, although this effect was stronger for same-sex peers than opposite-sex peers.

Attachment to teachers, classmates, the school and the instructional program shields students against adverse circumstances and student engagement in school life promotes autonomy, positive social interactions, and mastery of tasks. These positive outcomes appear to enhance life satisfaction and general well-being among urban teenagers (Masten, 1992).

2.5.3.2. Educational aspirations and expectations

An important element of students' relationships with family, teachers and peers appears to be their educational aspirations and expectations (Eivers et al., 2004). Waxman et al., (1997) found that more resilient students perceived their teachers as having higher expectations for them and that they themselves had higher academic self-concept and aspirations than students not considered to be demonstrating resilience. Howard, Dryden and Johnson (1999) also found that more resilient students believe their teachers have higher expectations of them and in addition the students had higher aspirations and achievement motivation and better social and academic self-concepts.

Schoon, Parsons and Sacker (2004) found that teacher expectations, students' own educational motivation, parental involvement in child's education, parental educational aspirations, students' own job aspirations and behaviour adjustment were the most significant protective factors associated with academic achievement. Using regression analyses, they found that these protective factors halved the impact of social adversity on academic attainment. However, the authors noted that there are significant differences in the pathways linking protective factors to educational attainment and adult adjustment between groups at either end of the socioeconomic scale. The results suggest that any protective effect associated with teacher expectations, own expectations for the future and behaviour adjustment operates more among relatively low risk families and works less well for children experiencing social marginalisation. However, parental educational aspirations for the child seem to be a vital protective factor for children experiencing social marginalisation.

Parental expectations appear to be a more important predictor of staying in school than parental aspirations, thus implying that aspirations alone are not as effective in changing behaviour as expectations are. Parents who expect their children to remain in education may give more support and guidance than those who have high hopes but little expectation of them being realised. Furthermore, students whose parents expect them to stay in education may be more likely to expect to stay too, which may cause them to think in terms of higher aspirations for the future (Sacker & Schoon, 2006). Parental expectations have been found to vary according to parental education level. For example, in the GUI study, Quigley and Nixon (2016) found that mothers who had completed third-level education were more likely to expect their children to do the same, while those who did not have third-level education were less likely to do so.

2.5.3.3. Parental involvement in their child's education

The importance of parent-involvement in their child's education has also been highlighted in the education literature. Benner, Boyle and Sadler (2016) found that greater parental school-based involvement (such as being a member of the school's parent-teacher organisation or volunteering at the school) and academic socialisation (i.e., expectations and academic advice) were related to higher grades two years later and higher educational attainment 10 years later. Benner et al., (2016) also found that school-based involvement was particularly beneficial for those who had poorer prior achievement and those from families with lower socioeconomic status, whereas parental educational expectations was more influential for those from families experiencing higher levels of socioeconomic status or who had higher prior achievement. The authors argues that the fact that they found that parental educational involvement continued to exert it's influence 10 year later 'points to the long reach of parental involvement in the lives of young people' (p. 1060).

There are a number of different pathways through which parental engagement with learning can influence a child's learning. Schoon, Parsons and Sacker (2004) suggested that the effects of family socioeconomic background are mediated through the socialisation experiences within the family environment. They noted that family factors associated with educational resilience include parenting style, parental involvement and expectations for the child's education and that parents influence the development of educational achievement through direct involvement with schools or by encouraging their children to succeed academically.

Cooper & Crosnoe (2007) argue that parents' communication with teachers and other parents gives them 'insight into how schools work, facilitates the flow of information between school and home and promotes school-related discussions with their children, thereby conveying the importance of education to children' (p. 375). They suggest that parents who are actively involved in their children's education raise academically-oriented children, and academically-oriented children involve their parents in their education (Crosnoe, 2001). Therefore, one social psychological resource promotes the other which leads to a strengthening of bonds to school across generations. The findings from their study show that the academic orientation of children at risk of poverty increased with increased parental involvement. In fact, they noted that children who are at risk of poverty who also have highly involved parents were the most academically oriented of all the children in the study.

Parental involvement and student academic orientation may have a different relationship in different socioeconomic groups. For example, among children experiencing social marginalisation, involvement of parents may be more teacher initiated, whereas among more advantaged children parents may engage in more parent-initiated involvement, suggesting that parents with varying levels of socioeconomic status could be engaged in ways that have very different implications for their children. Cooper and Crosnoe (2007) noted that the strong positive association between parental involvement in education and children's academic orientation among families experiencing social marginalisation that was found in their study suggests that parents with lower levels of socioeconomic status may be more consistent in their level of involvement in the schooling process. For example, parents of children experiencing social marginalisation may maintain involvement regardless of their child's age or performance in school. This involvement is likely to be more important for children at risk of poverty because they have fewer resources overall.

2.5.3.4. Engagement and meaningful participation

The importance of student engagement with school and other activities in promoting resilience has also been highlighted in the research literature. Bandura's (1993) social cognitive theory emphasises that belief in one's efficacy is best promoted through mastery of new experiences. Wang et al. (1995) have postulated that when students become convinced they are instrumental in their learning success, they work harder to overcome difficulties. Also, historically, research has found a consistent link between engagement and academic performance (Cobb, 1972; Good & Beckerman, 1978; Perry, Guidubaldi & Kehle, 1979). Finn and Rock (1997) found that more resilient students were more likely to come to class on time; to be prepared for and participate in class work; and to avoid being disruptive in class when compared to students not considered to be demonstrating resilience. They also found that these differences remained when home background and psychological characteristics were controlled for. Quigley and Nixon (2016) noted that, involvement in extra-curricular activities among nine-year-old children in Ireland differed by maternal levels of education. They found that as maternal education increased, the proportion of children who took part in both indoor and outdoor activities with their parents also increased. Similar patterns were observed for involvement in activities without their parents, such as cultural activities and sports activities. However, while participation in arts-based or sports-based activities was associated with higher verbal reasoning scores, participation in shared activities with parents was associated with lower scores (Quigley & Nixon, 2016).

Student engagement may have effects because of what happens as a result of engagement. That is, students acquire new skills, such as organisational skills, planning skills and time-management. They may also develop discipline, strengthen their motivation or receive positive reinforcement that influences their personality characteristics (Holland & Andre, 1987) as well as develop self-esteem and conflict resolution skills (Downes, Maunsell & Ivers, 2006; Downes & Maunsell, 2007).

2.5.3.5. Personal attributes of the student

Many studies have demonstrated that a number of personal characteristics of students are related to academic resilience. Martin and Marsh (2006) found that five factors predict academic resilience: self-efficacy, control, planning, low anxiety and persistence. They propose a 5-C model of academic resilience: confidence (self-efficacy), coordination (planning), control, composure (low anxiety) and commitment (persistence). They also found, through path analysis, that academic resilience subsequently predicts three educational and psychological outcomes: enjoyment of school, class participation, and general self-esteem over and above the motivation and engagement factors underpinning academic resilience. Significantly higher social self-concept, achievement motivation and academic self-concept have also been reported among more academically resilient students (Waxman & Huang, 1996; Waxman, Huang & Wang 1997).

Self-esteem and locus of control also appear to play an important role in educational resilience. Finn and Rock (1997) found that higher levels of self-esteem and a greater sense of control over one's life are both characteristic of low socioeconomic minority students who succeed in school, even when socioeconomic status and family structure are taken into account. They also found that higher self-esteem also distinguishes those who remain in school in spite of poor grades and/or test scores from those who choose to leave without graduating. Interestingly, many of the same attributes are found among successful students who are not at risk. Also, using data from the National Educational Longitudinal Study (NELS:88), Peng, Lee, Wang and Walberg (1992) identified lower socioeconomic students from urban communities whose combined reading and mathematics test scores were in the highest quartile on national achievement norms. These students had higher self-concept and educational aspirations and felt more internally controlled than students who were not considered to be demonstrating resilience.

In general, social competence, good problem-solving skills, independence and a clear sense of purpose are the most commonly cited attributes of more resilient children (Masten, Morison, Pelligrini, & Tellegen, 1990).

2.5.3.6. Gender and resilience

Another factor that has emerged in the education and resilience literature as a predictor of developmental outcomes is gender. While, gender differences have been noted in the some of the education literature in Ireland, the findings have been mixed, with girls outperforming boys in some subject areas or boys outperforming boys in other areas (Kavanagh et al., 2015; Clerkin, Perkins & Cunningham, 2016). Where differences have been noted, it has been suggested that these may be the result of differences in engagement or attitudes between boys and girls (OECD, 2015). Mixed results in terms of gender differences have also been noted in the resilience literature, with some studies finding females to be more academically resilient (Finn & Rock, 1997) other finding that boys display greater levels of academic buoyancy (Martin & Marsh, 2008) and others again finding no difference between boys and girls (Martin & Marsh, 2006). In a sample of adolescents in Ireland, boys were found to report higher levels of personal competence, while girls reported greater levels of social resources (Kelly, Fitzgerald & Dooley, 2017). Similarly, Nixon (2012) found that in the GUI sample, nine-year-old girls were more likely to display problems of an internalising nature, while boys tended to display problems of an externalising nature.

It is likely that gender differences, where they do exist, may be related to the specific domain being assessed. For example, Martin (2004) noted that girls score higher on scales of academic engagement but also display higher levels of general anxiety. Therefore, how resilience in conceptualised and measured in particular studies may contribute to observed differences across gender.

2.6. The current study

Using data from the Growing Up in Ireland (GUI) study, the current study aims to identify children who are deemed to be at-risk of social marginalisation in education but who overcome the odds and perform better than is expected of them given the economic status of their families. Furthermore, this study intends to explore the factors associated with academic resilience among these children as well as the processes through which academic resilience emerges.

While much of the literature on resilience acknowledges that resilience is the result of the interrelationships between many factors from across all aspects of children's lives, many studies are limited in terms of the scope of variables that can be assessed. A particular gap in the academic resilience literature is how processes between the child's home and school environments may contribute towards resilience. For example, Ingrid Schoon's (2006) regression model of academic resilience examined aspects of the child's personal attributes, as well as some elements of their family life and social integration, but variables examining the child's school environment were lacking. Also, while the study of academic resilience in PISA (OECD, 2011), focused on variables related to schooling, aspects of the home environment, such as parents involvement in their child's education, were not assessed. As a result, it is difficult to have a more holistic view of the factors and processes that can contribute to resilience and which may inform social policies aimed at addressing social marginalisation in education.

The current study aims to expand previous research by exploring factors and processes from across the various spheres that the child encounters in their life, drawing on Bronfenbrenner's bioecological theory of development (i.e., by using information on the child's family life, their relationship with their teachers and peers, their engagement in activities outside school, the child's own attributes and examining the processes between them). While the aim of the current study is not to explicitly assess Bronfenbrenner's bioecological theory, it is used as a framework to understand the processes which may contribute to more academically resilient outcomes. Using Bronfenbrenner's definition of proximal processes, the current study aims to examine the 'transfer of energy between the developing human being and the persons, objects, and symbols in the immediate environment' (Bronfenbrenner & Evans, 2000, p. 118). Nevertheless, it is acknowledged that the examination of reciprocal interactions is limited in the current study.

While large international assessments such as PISA have repeatedly found an association between socioeconomic status and academic achievement, it can be argued that the measures of socioeconomic status used in these studies lack solid theoretical meaning (Caro et al., 2014). In addition to this, the use of a relative measure of risk of poverty in the study of academic resilience using data from PISA is problematic. Such measures offer little insight into the actual experiences of children considered to be at-risk or how the risk experience may be reduced through protective factors.

As Kellaghan (2001) noted, social marginalisation in education can be considered in terms of economic, social and cultural capital. The current study narrows the focus of socioeconomic status by concentrating on children experiencing economic adversity, however it goes beyond other studies by examining how factors associated with cultural and social capital (such as parental involvement in their child's education, family climate, engagement in extracurricular activities etc.) interact with each other in the lives of these children considered to be at-risk of poverty. Given the strong relationship between medical card possession and achievement in Ireland, as well as the fact that those who qualify for a medical card have low weekly incomes, children whose family has access to a medical card are considered to have lower levels of economic capital and therefore are at-risk of poverty. In this way, an absolute measure of economic adversity, as opposed to a relative measure, is used in this study.

Given the recent emphasis on improving literacy and numeracy among children in Ireland, resilience in the current study is defined in terms of academic outcomes, specifically performance on standardised assessment of reading and mathematics. One methodological limitation in the field of academic resilience is that the measures of achievement used in studies vary and tend to be limited to specific domains. In Schoon's study, a measure of reading ability was used to establish academic achievement, while in PISA science achievement was used. The current study differs from these studies by examining high performance in both literacy and numeracy, so as to identify protective factors and processes among children who display strong academic outcomes overall, rather than a strength in any one particular domain. Also, it was decided to concentrate on children who were performing at particularly high levels in these areas of competence, so that the most prominent factors associated with better-than-expected outcomes could be identified. Therefore, in the current study children experiencing social marginalisation and whose reading and mathematics scores from the GUI study are at least half of a standard deviation above the average reading and mathematics scores of all children are considered to display academic resilience.

Using a person focused approach; children demonstrating academic resilience will be compared to more academically vulnerable children (i.e. children experiencing social marginalisation and who obtain reading and mathematics scores at or below the average for children with access to a medical card) on a number of child, family and school characteristics to produce a profile of children considered to demonstrate academic resilience in Ireland. Secondly, a variable focused approach will be used to develop a multi-dimensional model of academic resilience which illustrates the processes through which these indicators of social and cultural capital are associated with academic resilience.

Bronfenbrenners' bioecological theory (Bronfenbrenner & Morris, 1998) acknowledges that time and timing play a crucial role in human development. While many researchers acknowledge that the factors and processes associated with resilience can depend on developmental time points, few examine how such associations may change throughout child development. Those studies that do attempt to examine the dynamic nature of resilience tend to focus on identifying resilience at a particular time point, identifying the factors associated resilience at that time point and then describing how those factors vary over time but not how the association between these factors and resilience may change (Schoon, 2006). Therefore, it is unclear whether the particular associations between various factors and processes and academic resilience might vary at different age levels. The current study aims to explore this issue by testing a model of academic resilience at two age levels (nine and 13 years old), using data from the first and second waves of the GUI child cohort study, to explore how these processes might contribute to more academically resilient outcomes at different age levels.

Chapter 3 outlines the methodology used in the current study, including an overview of the conceptual framework, sampling methodology and procedures used in the GUI study. This chapter also provides descriptions of the scales measured as part of GUI that are also used in the current study, as well as listing variables from the GUI dataset which are considered to represent constructs found to be associated with academic resilience. Chapter 3 concludes by describing the aims of the current study.

Chapter 3. Methodology

The current study aims to identify the factors and processes associated with academic resilience among children at risk of poverty using data from the *Growing Up in Ireland* (GUI) child cohort study. Data from waves one and two of the GUI child cohort study is used so that a model of academic resilience (based on the education and resilience literature) can be tested at two time points – nine and 13 years old. This chapter begins by presenting a brief overview of the GUI study, including the sampling methodology and procedures used to conduct the study. Secondly, the scales measured in the GUI study that also form part of the current study are described, including, where possible, the reliability coefficients of these measures based on the full GUI sample and the sub-sample of children at risk of poverty. Next, variables from the GUI dataset which are considered to represent constructs found to be associated with academic resilience (based on a review of relevant literature in Chapter 2) are listed along with their coding structure and any relevant procedures that were used to prepare the data for analyses are described. Finally, the analysis strategy for the remainder of the study is described.

3.1. Growing Up in Ireland

Growing up in Ireland (GUI) is a national longitudinal study of children in Ireland which studies the factors associated with the wellbeing of children in 21st century Ireland. The project involves studying two cohorts of children, a child cohort (with data first collected when these children were nine years old) and an infant cohort (with data first collected when these children were nine months old.) The current study focuses on the child cohort of the GUI study and uses data collected for these children at nine and 13 years old. Data has also been collected for these children at 17/18 years old and it is planned to conduct further data collection at 20 years old, but these collections will not form part of the current study. GUI was commissioned by the Government of Ireland and is funded by the Department of Health and Children through the Office of the Minister for Children (OMC), in association with the Department of Social Protection and the Central Statistics Office (Murray et al., 2011). The study is administered by a team of researchers at the Economic and Social Research Institute (ESRI) and Trinity College Dublin (TCD).

3.1.1. Conceptual framework

The conceptual framework for GUI is summarised here but is discussed in more detail in *Growing Up in Ireland – Background and Conceptual Framework* (Greene et al., 2009). GUI draws on a range of influences on children's developmental outcomes, including the individual and family characteristics and the economic, social and physical environments in which children are raised (Greene et al., 2009).

Central to the conceptual framework of the GUI study is Bronfenbrenner's bioecological model of child development (Bronfenbrenner & Morris, 2006) which proposes that developmental outcomes are a result of a complex interplay between a large number of factors including the biology of the child, their immediate environment and wider influences such as the child's community and the society in which they live. Bronfenbrenner's bioecological model also informs the conceptual framework for the methodology in the current study, with variables perceived to be closer to the child's immediate environment considered to be most influential. The adoption of this 'comprehensive, ecological framework underpins the decision to seek information on the children from multiple informants' (Williams et al., 2009, p19) in the GUI study and therefore information on the study children is derived from the children themselves, their parents, their teachers, school principals and carers. Similarly, much of the literature on resilience emphasises the interaction between the individual and a multitude of contexts in developing resilience. Therefore, the GUI study offers an appropriate framework through which to examine resilience.

Greene et al. (2009) note that 'within this complex of factors, some increase the risk of poor outcomes whereas others are protective' (p. 14) but that even when a protective factor is present it does not necessarily follow that a poor outcome will result. It is also noted by Greene et al. that the examination of risk and protective factors and the circumstances leading to more resilient outcomes offers the possibility of identifying and informing policy interventions, which is a principle aim of the GUI study. This indicates that the concept of resilience is a central part of the conceptual framework of GUI. Also, although the examination of social marginalisation on education is not a primary aim of GUI, the wealth of information on child development outcomes and access to resources and services contained in the study mean it is well placed to explore themes of equality and inequality (Williams, Nixon, Smyth & Watson, 2016).

3.1.2. Sample

This section provides a summary of the sampling procedures used as part of the GUI child cohort study at waves one and two. Full descriptions of the sampling methodology used in each wave can be found in *Sample design and response in Wave 1 of the nine-year cohort of Growing Up in Ireland* (ESRI, 2010a) and *A summary guide to Wave 2 of the child cohort (at 13 years) of Growing Up in Ireland* (Quail, Williams, Thornton & Murray, 2014). Wave one of the child cohort study aimed to interview a representative sample of 8,500 nine-year-old children and their parents/guardians. The age definition was operationalised as children born between 1st November 1997 and 31st October 1998. The target sample for wave two included all study children who participated in the first round of interviewing.

At wave one, the sample design was based on a two-stage selection process in which the school was the primary sampling unit and the children within schools were the secondary units. The population of schools was split into two subgroups – those that were identified from the Department of Education and Skills records as having 40 or fewer nine-year-olds enrolled and those that had more than 40 nine-year-olds enrolled. Among schools containing 40 or fewer nine-year-olds the sample was selected on a systemic stratified basis, according to the following stratification variables: county, disadvantaged status, denominational status, categorical size (i.e. the total number of nine-year-old pupils) and gender mix. Schools with more than 40 nine-year-olds were selected based on probability proportionate to size for the school, meaning that the larger the school the higher its selection probability. This ensured that children in large schools, which could otherwise be underrepresented due to lower probability of selection, were adequately accounted for in the sample. The focus of the current study is academic resilience and therefore the school environment is an important factor in the identification of academic resilience. The sample design used in GUI ensured that children from a variety of school types were included in the sample frame meaning that academic resilience could be examined across a representative sample of the school-going population.

The second phase of the sampling procedure involved selecting students within schools that had agreed to participate. An upper threshold of 40 was imposed on the number of pupils to be recruited from any given school (ESRI, 2010a). In schools where there were 40 or fewer nine-year-old pupils enrolled, all such pupils were selected. In schools with more than 40 nine-year-old pupils, principals were provided with a set of random numbers to select which pupils to include/exclude from the sample. Information packs, including consent forms, were sent home with all selected children to give to their parents/guardians. Inclusion in the study was on an opt-in basis with consent and assent forms being signed by the parent(s)/guardian(s). Parents/guardians were asked to return completed consent forms, including their contact details, to the child's school. Completed forms were collected by the interviewer and the contact details provided were used to make direct contact with the family and arrange interviews.

A fixed panel sample design was used for wave two. The target sample for wave two included all 8,568 study children who participated in the first round of interviewing, who were traced using their Personal Public Service Number (PPSN) and the contact details of a family member and friend (which was collected at wave one).

3.1.3. Response rates

At wave one, a total of 1,105 schools were sampled from a population of 3,246 eligible schools (i.e., schools which have nine-year-olds enrolled or may have nine-year-olds enrolled in subsequent years) and, of these, a total of 910 schools agreed to participate giving a response rate of 82.3%, which is line with international standards (e.g., for PISA and PIRLS/TIMSS). There was a strong relationship between school size and response rate, with participation rates falling as school size (i.e. the number of nine-year-olds enrolled) increases (from 88% among the smallest schools to 75% among the largest schools). Participation among schools designated as disadvantaged was also lower compared to non-designated schools (76.3% compared to 83.3%). Lower response rates were also noted in Dublin, the Mideast and the Mid-west regions, although the lower rates in the former two regions are related to school size (ESRI, 2010a).

The second phase was the recruitment of children within schools. Consent was received from the parents/guardians of a total of 9,645 children, giving a family response rate of 56.6%. Approximately 10% of those who consented to participate in the study did not go on to complete the surveys when the interviewer called to their home. A total of 8,655 children and their families successfully completed the survey; with 8,568 having valid data which is included in the final data file, giving a final response rate of 50.3%. Attrition was greatest among children in private schools, special schools, designated disadvantaged schools and schools classified as having a religious denomination other than Roman Catholic (ESRI, 2010a). The response rates of children in wave one of GUI is lower than for international studies such as PISA and TIMSS/PIRLS. However, given the large number of children involved in GUI it is likely that much of the variability in the population of nine-year-olds is accounted for and therefore broad generalisations can be made to the wider population.

At wave two, 7,423 children participated giving an overall response rate of 87.7% (unweighted), when families who had moved abroad (103 children) were excluded. Of those who did not participate, 7.9% were due to refusals, 2.6% could not be contacted and 1.8% did not participate for some other reason (Quail et al., 2014). There is evidence that indicators of social advantage or disadvantage are associated with participation at wave two. Slightly older families in which the primary caregiver was better educated were more likely to participate in wave two (Thornton, Williams, McCrory, Murray & Quail, 2016).

The response rates outlined above indicate some imbalances in the recruited sample which may have implications for the analysis in the current study. In particular, children attending schools in receipt of the School Support Programme under DEIS and those who parents have lower levels of education may be underrepresented in the samples in the current study. To address these imbalances the data were reweighted to (a) ensure the structure of the completed sample was in line with the population and (b) compensate for any imbalances in the recruited sample. The weights were constructed by the study consortium in two steps to reflect the sample recruitment, i.e., an initial weight was created at the school level[3] followed by a household level weight. Full details of the process of creating weights can be found in ESRI (2010a). In the current study, data were weighted using the weighting factor (WGT_9YR at age nine and WGT_13YR at age 13) for descriptive analyses only. As recommended by Aitkin, Francis and Hinde (2005), and as with previously-reported hierarchical linear models of Irish students (e.g., Cosgrove, Shiel, Sofroniou, Zastrutzki, & Shortt, 2005) weights were not applied for the logistic regression or structural equation modelling in chapters 4 and 5 and therefore the imbalances in the samples should be borne in mind when interpreting findings from these analyses.

[3] Six main variables were used in the generation of the first stage (school-based) weight: number of nine-year-olds in the school; type of school (private, special or mainstream); region (based on planning region); designated disadvantaged status; religious denomination; and co-educational status.

3.1.4. Survey instruments and procedures

A number of instruments were developed for administration in schools and in the family home (Table 3.1). The study instruments were developed by the study team at the Economic and Social Research Institute (ESRI) and Trinity College, Dublin (TCD), in association with a number of other groups involved in the study.[4] All instruments administered in schools at age nine were self-completion measures that were administered in paper-and-pencil format. For the home-based instruments, interviews were conducted in the study child's home with the study child him or herself, the primary caregiver (the person who provided most care and who knew most about the study child – usually the child's mother/mother figure) and, where applicable, the secondary caregiver (the spouse or partner of the primary caregiver – usually the child's father/father figure) (ESRI, 2010a). The main interviews were administered on a CAPI (Computer Assisted Personal Interview) basis for all household respondents. More sensitive questions were extracted and were administered to respondents on a self-complete paper supplement at age nine and using the Computer Aided Self-completion Interview at age 13 (Murray et al., 2011; Quail et al. 2014). In order to achieve as inclusive a sample as possible, the household questionnaires were also available in Irish, French, Polish, Romanian and Russian at wave one and in Chinese, French, Lithuanian, Polish and Romanian at wave two. Cognitive assessments and the Piers-Harris self-concept scale were completed by children in their school in wave one and at their home in wave two.

The fieldwork for GUI was carried out by a national panel of interviewers employed by the ESRI. All interviewers and all other staff involved in the project were security vetted by An Garda Siochana. All child interviews were carried out in the school and in the home and were done in the presence of another adult. In the home, the main and sensitive questionnaires were administered in the presence of the parent or guardian.

[4] These groups included the Scientific and Policy Advisory Committee (SPAC), the Children's Advisory Forum (CAF), expert panels and stakeholder groups.

Table 3.1: School- and home-based instruments administered in the GUI study

Instrument	Description of instrument	Wave
The Principal Questionnaire	A four-page questionnaire completed by the principal and which recorded information on school characteristics such as type; size; resources; ethos; practices and policies on bullying; pupil intake and discipline; and demographic details of the principal including qualifications, experience and job satisfaction.	1 &2
The Teacher-on-self Questionnaire	A four-page questionnaire completed by the study child's teacher and which collected background information on the teacher as well as details of their experience; qualifications; job satisfaction; organisation of their class; their perception of school policies; and their perception of parental engagement.	1
The Teacher-on-child Questionnaire	A two-page questionnaire completed by the study child's teacher and which recorded information on the background details and characteristics of the study child and his/her class; curricular activities and computer activities undertaken in the school; their perception of parental engagement with the study child's education; their assessment of the study child's academic performance; their perception of the mental health of the study child; the study child's experience of bullying (as a victim and/or perpetrator); and the study child's behaviour (as measured by the Strengths and Difficulties Questionnaire)	1
Piers-Harris II	A 60 item self-concept scale (see Section 3.2.1). This measure was completed by the child in their school in wave one and in their home in wave two.	1 & 2
Cognitive assessments	The Drumcondra Primary Reading and Mathematics tests (DPRT-R and DPMT-R) were completed by children at age nine and the Drumcondra Reasoning Test (DRT) assessed verbal reasoning and numerical ability at age 13 (see Section 3.2.3). Thirteen-year-old children also completed the British Ability Scales (BAS).	1 & 2
The Primary Caregiver Questionnaire	A questionnaire completed by the primary caregiver which recorded information on the study child's health; use of health services; diet and exercise; activities; emotional health and well-being; and education (past and present). The questionnaire also gathered information on the primary caregiver's health and lifestyle; the family context; the socio-demographics of the household; and details of the household's neighbourhood/community.	1 & 2
The Primary Caregiver Questionnaire (sensitive)	A questionnaire completed by the primary caregiver which gathered information on their relationship to the child; current marital status; relationship with partner; previous relationships; mental health; drug and alcohol use; contact with the Criminal Justice System; and information on non-resident parent (if relevant).	1 & 2
The Secondary Caregiver Questionnaire	A questionnaire completed by the secondary caregiver which collected information on the secondary caregiver's health, lifestyle, family context and socio-demographics.	1 & 2
The Secondary Caregiver Questionnaire (sensitive)	A questionnaire completed by the secondary caregiver which gathered details of their relationship to the study child; current marital status; relationship with partner; previous relationships; mental health; drug use; and contact with the Criminal Justice System.	1 & 2
The Study Child Questionnaire	A questionnaire completed by the study child which collected information on the study child's experience of school; their diet (and body image and dieting at age 13); what activities they engage in; parental discipline and their likes and dislikes.	1 & 2
The Study Child Questionnaire (sensitive)	A questionnaire completed by the study child which asked questions on where the study child lives; whether they like school or not; their experience of bullying (either as a perpetrator or victim); and their family. Questions on relationships and sexuality education, maturation, delinquency, psychotic experiences, smoking and drug use were also asked at age 13.	1 & 2
The Study Child Questionnaire (supplementary questionnaire)	A questionnaire completed by the study child which asked the study child a number of questions relating to their biological mother, biological father, mother's partner (if applicable) and father's partner (if applicable). These questionnaires gathered information on parent's encouragement of the study child at school; parental style; and parents' reaction to bold behaviour.	1 & 2
Measures of height and weight	Measures of height and weight were also taken for the study child, primary caregiver and secondary caregiver.	1 & 2

3.1.5. Ethical considerations

The quantitative phase of the nine-year-old cohort was carried out under ethical approval granted by the Research Ethics Committee of the Health Research Board. Study procedures were also guided by and adhered to the relevant Acts in Irish legislation, including the Data Protection Acts 1988, 2003 and the Statistics Act, 1993. Procedures relating to child protection were informed by the *Children First Guidelines* (Department of Health and Children, 1999). Analyses of subgroups in the current study involved groups that were sufficiently large enough that participants could not be identified and no identifying information (i.e., names or date of birth) was available to the researcher.

3.2. Scales measured in GUI and used in the current study

A number of measured scales that were included in GUI were selected as measures of factors associated with academic resilience in the current study and are described in this section. Some measures were included in waves one and two of GUI, while others formed part of one or other wave of the study. Where possible, the reliability of each scale (measured in terms of internal consistency using Cronbach's alpha) was measured using the full GUI sample and the subsample of children at risk of poverty for each wave. In the current study children at risk of poverty are defined as those whose families have access to a full medical card.

3.2.1. Piers-Harris Children's Self-concept Scale

The study child's self-concept was measured using the Piers-Harris Children's Self-concept Scale 2nd edition (Piers & Herzberg, 2002), a revised version of the 1963 Piers-Harris Children's Self-concept Scale. This is a self-report measure of self-concept in children and adolescents between the ages of seven and 18. In GUI, the scale was completed by children at age nine and again at age 13. It is made up of 60 statements that express how people feel about themselves, each with a yes/no answer option. The self-concept scales include the total score (based on all 60 items) and six domain scales, which measure specific aspects of self-concept. These include:

- *Behavioural Adjustment*: A subscale of 14 items measuring admission or denial of problematic behaviours in home and school settings.
- *Intellectual and School Status*: a subscale of 16 items reflecting the respondent's assessment of his/her intellectual abilities and academic performance.
- *Physical Appearance and Attributes*: a subscale of 11 items about perceptions of physical appearance and other attributes such as leadership and ability to express ideas.
- *Freedom from Anxiety*: a subscale of 14 items assessing anxiety and dysphoric mood, specifically fear, unhappiness, nervousness, shyness and feeling left out of things.
- *Popularity:* a subscale of 12 items exploring the respondent's social functioning.
- *Happiness and Satisfaction:* a subscale of 10 items assessing general feelings of happiness and satisfaction with life.

The scales are scored so that a higher score indicates a more positive self-evaluation in the domain being measured. An Inconsistent Responding and a Response Bias index are also included to identify random response patterns and tendencies to respond in a certain manner irrespective of item content, such as a positive response bias. It is a requirement that respondents have at least second-grade reading ability to complete the Piers-Harris Children's Self-concept Scale.

The individual items of the Piers-Harris scale were not included in the GUI dataset due to copyright law; therefore it was not possible to test the reliability of the scales in the current study using the GUI sample. However, in a sample of 1,387 children aged 7 to 18 years old, the Piers-Harris II Children's Self-concept Scale (2nd edition) showed good internal consistency with a Cronbach's alpha of .91 for the total scale and Cronbach's alphas of over .74 for the subscales (Piers & Herzberg, 2007; Table 3.2)

Table 3.2: Reliability coefficients for the six subscales and total scale of the Piers-Harris Children's Self-concept Scale (2nd edition)

Scale	Cronbach's alpha
Behavioural Adjustment	.81
Intellectual and School Status	.81
Physical Appearance and Attributes	.75
Freedom from Anxiety	.81
Popularity	.74
Happiness and Satisfaction	.77
Total	.91

Source: Piers and Herzberg, 2007

The Piers-Harris II Children's Self-Concept Scale (2nd edition) also shows good construct validity with most of the subscales exhibiting correlations with each other in the moderate to high moderate range (Murray et al.; 2011). Furthermore, four of the six subscales show significant negative correlations with the Attitudes towards Guns and Violence Questionnaire (AGVQ) total score; and negative correlations were found between three of the subscales (as well as the total score) and the Aggression Questionnaire (AQ), indicating good levels of convergent validity (Murray et al.; 2011).

3.2.2. Strengths and Difficulties Questionnaire (SDQ)

The study child's behaviour was measured by the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997), which was completed by the child's primary caregiver and teacher at age nine, but just the child's primary caregiver at age 13. The SDQ is a questionnaire for assessing the psychological adjustment of 3 to 16 year olds (Table A3.1 in Appendix A). The questionnaire records 25 attributes, some positive and others negative, of the study child. The 25 attributes are divided into five scales, as follows:

1) Emotional Symptoms (5 items);
2) Conduct Problems (5 items);
3) Hyperactivity/Inattention (5 items);
4) Peer Relationship Problems (5 items);
5) Prosocial Behaviour (5 items).

For each of the five scales the score can range from 0 to 10 if all items were completed. Scale scores can be given if at least three items were completed. A Total Difficulties Score can be generated by summing scores for all scales except the prosocial scale, and the resultant score can range from 0 to 40. All scales, with the exception of the prosocial scale, are scored so that a higher score indicates a greater level of difficulty in the particular area being measured. A higher score on the prosocial scale indicates a greater level of prosocial behaviour. The SDQ can be completed by the parents or teachers of children aged 3 to 16; while there is a self-report version for 11 to 16 year olds. The SDQ can be used for screening, as part of a clinical assessment, as a treatment-outcome measure, and as a research tool (Garralda, Yates & Higginson, 2000; Goodman, Ford, Richards, Gatward & Meltzer, 2000; Goodman, Renfrew & Mullick, 2000).

The psychometric properties of the SDQ were assessed for the full GUI child cohort sample (at age nine and 13 years old) and for the full-medical card holders subsamples (at nine and 13 years old). The internal consistencies for the total scale of the parent-completed and teacher-completed SDQs were found to be generally satisfactory (tables 3.3 and 3.4), although many of the subscales displayed less than desirable reliability coefficients.

Table 3.3: Reliability coefficients for the five subscales and total scale of the Strengths and Difficulties Questionnaire (SDQ) in the full GUI sample (nine and 13 years old)

	Reliability Correlations (α)		
	Nine years old		Thirteen years old
Scale	Parent (*N*=8,515)	Teacher (*N*=7,755)	Parent (*N*=7,099)
Total Difficulties	0.765	0.848	0.806
Emotional Symptoms	0.663	0.740	0.688
Conduct Problems	0.552	0.690	0.569
Hyperactivity-Inattention	0.742	0.859	0.762
Peer Problems	0.516	0.658	0.523
Prosocial Behaviour	0.632	0.809	0.631

Table 3.4: Reliability coefficients for the five subscales and total scale of the Strengths and Difficulties Questionnaire (SDQ) in the sample of full medical card holders (nine and 13 years old)

	Reliability Correlations (α)		
	Nine years old		Thirteen years old
Scale	Parent (*N*=1,628)	Teacher (*N*=1,491)	Parent (*N*=2,424)
Total Difficulties	0.786	0.863	0.819
Emotional Symptoms	0.672	0.767	0.693
Conduct Problems	0.610	0.760	0.606
Hyperactivity-Inattention	0.731	0.869	0.769
Peer Problems	0.531	0.689	0.515
Prosocial Behaviour	0.682	0.818	0.659

Correlation coefficients for the parent-completed and teacher-completed versions of the SDQ (at age nine) were in the weak to moderate range (Table 3.5), indicating that while there is some commonality between the two formats of the measure they can be considered as two distinct measures of child behaviour.

Table 3.5: Correlation coefficients for the five subscales and total scale of the SDQ parent and teacher scores in the full GUI sample (nine years old)

Scale	Pearson (Spearman) Inter-rater Correlations Parent X Teacher (*N*=8,560)
Total Difficulties	0.395
Emotional Symptoms	0.233
Conduct Problems	0.250
Hyperactivity-Inattention	0.440
Peer Problems	0.297
Prosocial Behaviour	0.160

Note: All SDQ correlations are significant at p<.001.

The SDQ has been shown to correlate highly with both the Rutter scales (Goodman, 1997) and the Child Behaviour Checklist (Goodman & Scott, 1999; Klasen et al., 2000; Koskelainen, Sourander & Vauras, 2001; Becker, Woerner, Hasselhorn, Banaschewski & Rothenberger, 2004).

3.2.3. Drumcondra Tests

Each study child completed two academic assessments in a group setting within the school at both nine and 13 years old. Nine year-old children completed the vocabulary part of the Drumcondra Primary Reading Test – Revised (DPRT-R; ERC, 2007a), and Part 1 of the Drumcondra Primary Maths Test – Revised (DPMT-R; ERC, 2007b). Thirteen-year-old children completed the Drumcondra Reasoning Test (verbal reasoning and numerical ability).

The DPRT-R and DPMT-R are norm-referenced tests which sample the types of content and skills that characterise the 1999 primary schools English and mathematics curricula, so teachers can compare the performance of an individual pupil in their class with that of other pupils nationally. In the GUI study, only the first part of each test was used so as to reduce the burden on schools participating in the study. Also, as GUI used an age based sample, levels 2, 3 and 4 of these tests were used. Therefore, standards on these shortened versions of the test can only be defined in terms of the GUI sample and not in reference to the sample used in the standardisation of the full versions of the tests.

In this study, the results of the DPRT-R and the DPMT-R are reported in terms of the percentage of items answered correctly out of the total number of items on the test. Each level of the tests show good internal consistency for the full sample, with Kuder-Richardson Formula (KR_{20}) reliability coefficients of r=0.82 or above (Table 3.6 and 3.7). As the individual test items are not included in the GUI database, the reliability of the tests could not be tested for the full medical card subsample.

Table 3.6: Reliability coefficients for Form A vocabulary test of the DPRT-R, levels 2, 3 and 4 (nine years old)

Level	N	KR_{20} Reliability Coefficients
Level 2	2858	0.89
Level 3	4924	0.90
Level 4	574	0.90

Source: Personal communication, David Millar (ERC), 6th March 2017

Table 3.7: Reliability coefficients for Form A of the DPMT-R, levels 2,3 and 4 (nine years old)

Level	N	KR_{20} Reliability Coefficients
Level 2	2858	0.87
Level 3	4995	0.82
Level 4	596	0.85

Source: Personal communication, David Millar (ERC), 6th March 2017

The Drumcondra Reasoning Test (DRT) is a test of cognitive skills designed for students in sixth class (primary level) and the early years of post-primary schooling. The test consists of two subtests: verbal reasoning and numerical ability. Form C of the DRT is a shortened version of the original tests and designed for administration in the GUI study. Therefore, as with the DPRT-R and the DPMT-R, standards on the shortened version of this test can only be defined in terms of the GUI sample and not in reference to the sample used in the standardisation of the full versions of the tests. There are 20 verbal reasoning questions (Part 1) and 20 numerical ability questions (Part 2). The verbal reasoning and numerical ability subscales of Form C of the DRT also show good reliability in terms of internal consistency for the full GUI sample (Table 3.8)..

Table 3.8: Reliability coefficients for DRT Form C (Verbal Reasoning and Numerical Ability; 13 years old)

Scale	N	KR_{20} Reliability Coefficients
Verbal Reasoning	7148	0.82
Numerical Ability	7148	0.88

Source: Personal communication, David Millar (ERC), 6th March 2017

3.2.4. Emotionality, Activity and Sociability Temperament Scale (EAS)

The study child's temperament was measured at age nine by the Emotionality, Activity and Sociability Temperament Scale (EAS; see Table A3.2 in Appendix A), which was answered by the study child's primary caregiver. The EAS scale is a parental rating questionnaire that measures heritable aspects of temperament that are related to developmental differences in personality and behaviour. The instrument consists of four scales, each of which is represented by five items: Emotionality (a measure of distress); Activity (a measure of tempo and vigor); Shyness (a measure of inhibition and tension when with unfamiliar others); and Sociability (a measure of preference for being with others rather than being alone) (Boer & Westenberg, 1994). The psychometric properties of the EAS scale were assessed for the full GUI child cohort sample and for the full-medical card holder's subsample at wave one. The internal consistencies of the emotionality subscale was found to be generally satisfactory for both the full GUI sample and the full medical card subsample (Table 3.9), while the reliability coefficients for the other subscales were less than desirable.

Table 3.9: Reliablity coefficients for the four subscales of the Emotionality, Activity and Sociability Temperament Scale (EAS) (nine years old)

	Cronbach's alpha	
Scale	Full sample (N=8,568)	Medical card sample (N=1,644)
Emotionality	0.795	0.803
Activity	0.693	0.667
Shyness	0.676	0.637
Sociability	0.540	0.524

Scale intercorrelations are weak indicating that the Emotionality, Activity, Shyness and Sociability scales are relatively independent subscales in the GUI sample at age nine (Table 3.10).

Table 3.10: Correlation coefficients for the intercorrelations betweeb the four subscales of he EAS scale (nine years old)

Scale	Emotionality	Activity	Shyness	Sociability
Emotionality	–	-.139	.190	.023
Activity	-.139	–	-.308	.398
Shyness	.190	-.308	–	-.334
Sociability	.023	.398	-.334	–

3.2.5. Parenting Style Inventory – II (PSI-II)

The overall emotional climate in which particular parent-child interactions occur was assessed at age nine and 13 using the Parenting Style Inventory – II (PSI-II) which was designed to assess the construct of parenting style independently of parenting practice (Table A3.3 in Appendix A; Darling & Toyokawa, 1997). The purpose of the measure was to allow comparisons of the association of parenting style with child outcomes across diverse populations and a relatively large age range, therefore the measure was designed to be short, easy to understand and reliable. The PSI-II consists of three subscales, measuring three dimensions of parenting style: demandingness, emotional responsiveness and psychological autonomy-granting.

In the GUI study, nine-year-old children completed the Responsiveness and Demandingness subscales from the PSI-II (as Autonomy-granting was thought to be less appropriate for nine-year-olds than for the adolescents for whom it was originally developed), while thirteen-year-old children completed all three subscales. The internal consistency of each subscale in the GUI sample, as measured by Cronbach's alpha, was considered to be good for father's responsiveness (in the medical card sample at age nine and in both samples at age 13) but was considered to be less than desirable for the other subscales (tables 3.11 and 3.12).

Scale intercorrelations are weak to moderate at both age nine and 13 (all correlation coefficients are below r=.431) indicating that the Responsiveness, Demandingness and Autonomy-granting (at age 13) subscales are relatively independent subscales in the GUI samples.

Table 3.11: Reliablity coefficients for the two subscales of the Parenting Style Inventory (PSI) (nine years old)

	Cronbach's alpha			
	Full sample (N=8,568)		Medical card sample (N=1,644)	
Scale	Mother	Father	Mother	Father
Responsiveness	0.573	0.675	0.611	0.719
Demandingness	0.468	0.510	0.496	0.556

Table 3.12: Reliablity coefficients for the three subscales of the Parenting Style Inventory (PSI) (13 years old)

	Cronbach's alpha			
	Full sample (N= 7,099)		Medical card sample (N=2,424)	
Scale	Mother	Father	Mother	Father
Responsiveness	0.685	0.760	0.697	0.787
Demandingness	0.549	0.567	0.530	0.507
Autonomy-granting	0.584	0.634	0.549	0.648

3.2.6. Pianta Child-Parent Relationship Scale (CPR-S)

Child-parent relationships were measured in wave one and wave two of the GUI study using the Child Parent Relationship Scale (CPR-S; Pianta, 1992) (see Table A3.4 in Appendix A). This scale is a self-report instrument completed by mothers and fathers and it assesses parents' perceptions of their sons and daughters (Driscoll & Pianta, 2011). The instrument is made up of 30 items at wave one and 15 items at wave two, all of which are rated on a five-point Likert scale. At wave one, 15 items measure Conflict, 10 measure Closeness and five measure Dependency. At wave two, eight of items measure Conflict and seven measure Closeness. The Conflict subscale measures the degree to which a parent feels that his or her relationship with a particular child is characterised by negativity, while the Closeness subscale measures the extent to which a parent feels that the relationship is characterised by warmth and the Dependency scale measures the extent to which the parent feels the child is dependent on him/her. These subscales represent distinct domains of parent-child relationships, as evidenced by a relatively low correlation between them (all correlation coefficients were below r = .25).

The internal consistency of each subscale in the GUI sample, as measured by Cronbach's alpha, was good for both maternal and paternal ratings of Conflict (at age nine and 13) and Closeness (at age 13), but were less than desirable for the Dependency subscale at age nine (tables 3.13 and 3.14).

Table 3.13: Reliablity coefficients for the three subscales of the Child-Parent Rleationship scale (CPR-S) (nine years old)

	Full sample (N=8,568)		Medical card sample (N=1,644)	
Scale	Mother	Father	Mother	Father
Conflict	0.787	0.750	0.803	0.762
Closeness	0.649	0.643	0.679	0.710
Dependency	0.347	0.369	0.326	0.283

Table 3.14: Reliablity coefficients for the two subscales of the Child-Parent Rleationship scale (CPR-S) (13 years old)

	Full sample (N=7,099)		Medical card sample (N=2,424)	
Scale	Mother	Father	Mother	Father
Conflict	0.824	0.799	0.835	0.801
Closeness	0.753	0.744	0.773	0.738

3.2.7. Parental Monitoring and Child Disclosure

Three subscales from Stattin and Kerr's (2000) Parental Monitoring and Supervision scale (see Table A3.5 in Appendix A) were used in wave two of the GUI study to measure parental monitoring and child disclosure. The Parental Monitoring and Child Disclosure subscales were completed by both the primary and secondary caregivers and the Control subscale was completed by the study child. Nine statements were used to measure Parental Monitoring (i.e., parents' knowledge of the child's whereabouts, activities and associations), five measured Child Disclosure and six measured Control. All subscales were measured using a five-point Likert scale.

Due to the labelling of the individual items that make up these subscales in the GUI database it was not possible to test the reliability of these subscales using the GUI data in the current study. However, a study of 703 Swedish eighth grade students showed strong reliability for the Parental Monitoring (α = 0.89), Child Disclosure (α = 0.84), Control (α = 0.82) subscales (Stattin & Kerr, 2000).

3.2.8. Ten Item Personality Inventory (TIPI)

The study child's personality was measured by the Ten Item Personality Inventory (TIPI; Gosling, Rentfrow & Swann, 2003) which was completed by their primary caregiver at wave two (see Table A3.6 in Appendix A). The TIPI is a brief measure of the Big-Five personality dimensions and consists of ten items which are used to form five subscales: Openness, Conscientiousness, Extraversion, Agreeableness and Emotional Stability. The overall TIPI scale and each of the subscales showed less than desirable reliability for the whole GUI wave two sample (Table 3.15) however, Gosling [5] notes that the TIPI was designed to measure very broad domains with only two items per dimension which almost guarantees it will perform poorly in terms of alpha reliability.

Scale intercorrelations are weak (all correlation coefficients are below *r*=.258) indicating that the Extraversion, Agreeableness, Conscientiousness, Emotional and Openness subscales are relatively independent subscales in the GUI samples.

Table 3.15: Reliability coefficients of the five subscales of the Ten Item Personality Inventory (TIPI) (13 years old)

Scale	Full sample (N=7,099)	Medical card sample (N=2,424)
Extraversion	0.468	0.409
Agreeableness	0.354	0.396
Conscientiousness	0.462	0.430
Emotional	0.468	0.462
Openness	0.267	0.284

3.2.9. The Inventory of Parent and Peer Attachment (IPPA)

Children's perceptions of the positive and negative affective/cognitive dimension of relationships with their close friends were measured using the Inventory of Parent and Peer Attachment at wave two (IPPA; Armsden & Greenberg, 1987). The full measure comprises of 25 items and three broad dimensions are assessed: Degree of Mutual Trust; Quality of Communication; and Extent of Anger and Alienation. Seventeen of the items from the IPPA were included in wave two of the GUI study to measure two of the subscales (Degree of Mutual

[5] http://gosling.psy.utexas.edu/scales-weve-developed/ten-item-personality-measure-tipi/a-note-on-alpha-reliability-and-factor-structure-in-the-tipi/

Trust and Extent of Anger and Alienation) (see Table A3.7 in Appendix A). The reliability of the two subscales (as measured by the Cronbach's alpha) was adequate for the full GUI sample and the medical card subsample (Table 3.16). A correlation coefficient of r=-.342 indicates that the Degree of Mutual Trust and Extent of Anger and Alienation scales are relatively independent.

Table 3.16: Reliability coefficients for the two subscales of the Inventory of Parent and Peer Attachment (IPPA – peers) (13 years old)

Scale	Full sample (N=7,099)	Medical card sample (N=2,424)
Degree of Mutual Trust	0.864	0.859
Extent of Anger and Alienation	0.623	0.599

3.2.10. The Short Mood and Feelings Questionnaire (SMFQ)

Children's low mood or depression was assessed using the Short Mood and Feelings Questionnaire (SMFQ; Angold, Costello, Messer, Pickles, Winder & Silver, 1995). This scale contains 13 items and was completed by the study child (see Table A3.8 in Appendix A). This scale demonstrated good reliability (as measured by Cronbach's alpha) in the full GUI sample (α = 0.870) and the full medical card subsample (α = 0.885).

3.2.11. Household social class

In GUI, household social class was derived from the occupations of the primary and secondary caregivers at waves one and two. Both caregivers, where relevant, were asked to provide details of their current occupation, or where the respondent was unemployed or retired at the time of interview, previous employment outside the home. Six categories of social class are classified in GUI:

1. Professional workers;
2. Managerial and technical;
3. Non-manual;
4. Skilled manual;
5. Semi-skilled;
6. Unskilled.

3.2.12. Equivalised income

In GUI, household income was equivalised to take account of the number of adults and children in the household to allow for comparison across all sizes of households. An equivalence scale was used to assign a 'weight' to each household member. The equivalence scale assigned a weight of 1 to the first adult in the household, 0.66 to each subsequent adult (aged 14+ years) and 0.33 to each child (aged less than 14 years) living in the household (ESRI, 2010b).

3.3. Identification and classification variables in GUI

The aim of the current study is to examine the factors that are associated with academic resilience and the processes through which these factors work. A review of relevant literature identified many factors associated with academic and educational resilience. In the current study, these factors are organised under seven general headings, all considered to be key areas of a child's life that are associated with academic resilience, for the purposes of identification of variables from the GUI dataset: background characteristics; relationships with family, teachers and peers; educational expectations; attitudes towards school; parental involvement in their child's education; engagement and meaningful participation; and the personal attributes of the child.

Each survey instrument was reviewed to identify items which measure any of the seven general factors associated with academic resilience and selected variables are presented in the following seven sections. The coding structure for each variable is also presented. Where dummy coding was applied (in the case of categorical variables), in the majority of cases extreme negative values were used as reference categories (e.g., the child never likes school). Where groups of variables measured the same underlying construct and used the same response options, the same reference category was used, regardless of whether the statement was positively or negatively associated with resilience. Middle values were used with a small number of variables with three response options (e.g., well, average, poor for how well the child thinks they are doing at school) for ease of interpretation and where the extreme positive and negative values were both considered of value to the analysis. In some cases, the coding structure of variables differ for the logistic regression and the structural equation modelling, for ease of analysis and interpretation. Where a variable was not included in the structural equation models (due to lack of significance in the logistic regression models) it is specified as not applicable (NA). Also, principal component analysis was considered for the purposes of data reduction where a number of variables were thought to measure the same underlying construct. The following criteria were used when deciding the appropriateness of data for principal components analysis:

- Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) of 0.6 or above; and
- Correlation coefficients of *r*=.3 and above (Pallant, 2006).

3.3.1. Background characteristics

A number of background characteristics that were considered to be associated with academic resilience are included in the analyses. Table 3.17 presents the five variables that were used to measure background characteristics at both waves. These include the study child's gender, which has previously been found to be associated with academic resilience, and the proportion of the family's income that comes from welfare, the equivalised income of the child's household, the highest level of education among the study child's parents and the household social class, as measured by parental occupation. It was decided to include the variables measuring the proportion of the family's income from welfare and household equivalised income to explore whether there may be economic differences among full medical card holders that could be contributing to the better than expected reading and mathematics scores among the more academically resilient students. Parental education level and household social class are considered to be indicators of cultural capital and were also included in this analysis.

Table 3.17: Variables measuring the child's background characteristics

Variable	Coding structure: Logistic regression	Coding structure: Structural equation modelling	Wave
Child's gender	Male (reference category) Female	Male (reference category) Female	1 & 2
Equivalised income	Scale variable measured in euro	NA	1 & 2
Proportion of income from welfare	None Less than 50% 50% to less than 100% 100% (reference category)	Scale from 1 (none) to 7 (all)	1 & 2
Highest level of education of parents	Primary or less Lower secondary Upper secondary Diploma/Cert./ Apprenticeship (non-degree) Degree/Postgrad. (ref. cat.)	Scale measured in years of education (based on manual for ISCED classification)	1 & 2
Households social class	Professional/manager (ref.) Non-manual/Skilled worker Semi-skilled/Unskilled	Scale from 1 to 6 (unskilled; semi-skilled; skilled-manual; non-manual; managerial/technical; professional/managers)	1 & 2

3.3.2. Relationships with family, teachers and peers

Where possible, variables relating to the child's relationship with their family, teachers and peers were chosen to reflect structural aspects of relationships (e.g., whether the child has siblings, how many close friends the study child has) as well as the nature of relationships (e.g., parenting style, whether the relationship is positive, has conflict or is a dependent relationship). Variables were selected such that relationships with family, peers and teachers could be examined separately and so are presented separately in this section. Table 3.18 lists the variables related to the study child's relationships with their family (18 at wave one and 15 at wave two) and includes variables related to parenting style.

Five of the variables measuring relationships with family at wave one related to who in the family the study child would talk to if they had a problem. For the purposes of data reduction, principal components analysis was considered for these five variables. Due to a lack of strong correlation coefficients between variables (all but one were below r=.156) and a Kaiser-Meyer-Olkin value of 0.51, principal components analysis was deemed inappropriate and these five variables were included in their original format (see Table A3.9 in Appendix A).

Table 3.18: Variables measuring relationships with family

Variable	Coding structure: Logistic regression	Coding structure: Structural equation modelling	Wave
Mother's responsiveness (PSI)	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	1 & 2
Mother's demandingness (PSI)	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	1 & 2
Mother's autonomy granting (PSI)	Scale (mean = 0; SD = 1)	NA	2
Father's responsiveness (PSI)	Scale (mean = 0; SD = 1)	NA	1 & 2
Father's demandingness (PSI)	Scale (mean = 0; SD = 1)	NA	1 & 2
Father's autonomy granting (PSI)	Scale (mean = 0; SD = 1)	NA	2
Positive relationship with primary caregiver (Pianta CPRS)	Scale (mean = 0; SD = 1)	NA	1 & 2
Positive relationship with secondary caregiver (Pianta CPRS)	Scale (mean = 0; SD = 1)	NA	1 & 2
Conflict with primary caregiver (Pianta CPRS)	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	1 & 2
Conflict with secondary caregiver (Pianta CPRS)	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	1 & 2
Dependence on primary caregiver (Pianta CPRS)	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	1
Dependence on secondary caregiver (Pianta CPRS)	Scale (mean = 0; SD = 1)	NA	1
Child has brothers and sisters	No (reference category) Yes	NA	1
Positive relationship with siblings	Always Sometimes (ref. category) Never	Always Other (reference category)	1
Talks to mum about problems	No (reference category) Yes	NA	1
Talks to dad about problems	No (reference category) Yes	No (reference category) Yes	1
Talks to mum's partner about problems	No (reference category) Yes	NA	1
Talks to dad's partner about problems	No (reference category) Yes	NA	1
Talks to another relative about problems	No (reference category) Yes	NA	1
Parent feels they have fun with the study child every day?	No (reference category) Yes	NA	1
Parental monitoring – primary caregiver	Scale (mean = 0; SD = 1)	NA	2
Child disclosure – primary caregiver	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	2
Parental monitoring – secondary caregiver	Scale (mean = 0; SD = 1)	NA	2
Parental monitoring – secondary caregiver	Scale (mean = 0; SD = 1)	NA	2
Child's perception of parental control	Scale (mean = 0; SD = 1)	NA	2

Table 3.19 lists the eight variables related to the study child's relationships with their teacher, two of which were measured at wave one only and six of which were measured at wave two only. The child-teacher relationship variables measured at wave one reflect a positive overall relationship with their teacher, while those measured at wave two focus on the dynamics between the teacher and child within the classroom environment.

Table 3.19: Variables measuring relationships with teachers

Variable	Coding structure		Wave
	Logistic regression	Structural equation modelling	
Talks to their teacher about problems	No (reference category) Yes	NA	1
Child likes their teacher	Always Sometimes (ref. category) Never	NA	1
The child is told by a teacher that their work is good	Very often or often A few times or never (ref)	Very often or often A few times or never (ref)	2
The child is encouraged to ask questions in class	Very often or often A few times or never (ref)	NA	2
The child's teacher praises them for answering a question	Very often or often A few times or never (ref)	Very often or often A few times or never (ref)	2
The child is given out to by a teacher because their work is untidy or not done on time	Very often or often A few times or never (ref)	NA	2
The child is asked questions in class by the teacher	Very often or often A few times or never (ref)	NA	2
The child is given out to by a teacher for misbehaving in class	Very often or often A few times or never (ref)	NA	2

Table 3.20 presents the four variables that measured the study child's relationship with their peers, two of which were measured at wave one and three at wave two. Both waves of the study include measures of the number of close friends that the study child had as well as measures of the nature of the relationship between the study child and their friends.

Table 3.20: Variables measuring relationships with peers

Variable	Coding structure		Wave
	Logistic regression	Structural equation modelling	
Number of close friends (reported by primary caregiver)	None One Two or three Four or more (reference cat)	NA	1 & 2
Talks to their friends about their problems	No (reference category) Yes	No (reference category) Yes	1
Trustful of friends (IPPA)	Scale (mean = 0; SD = 1)	NA	2
Alienation from friends (IPPA)	Scale (mean = 0; SD = 1)	NA	2

3.3.3. Educational expectations

Where possible, it was decided to include the views of individuals from different contexts in the study child's life. Therefore, in the current study, the child's own educational expectations, as well as their parents' and their teachers' expectations of them, were considered separately so that the relationship of each with academic resilience could be investigated. Definitions of educational expectations vary greatly across studies (e.g., evaluations of intellectual performance, years of schooling, type of school attended and ambitions for future education and occupation [Seginar, 1983]). Due to the small number of such variables in the GUI study, the definition of educational expectations in the current study is limited to expectations for future educational attainment and ratings of school performance in general and in different subject areas. No data on teachers' educational expectations for the study child were collected at wave two.

Tables 3.21 to 3.23 present the variables related to the child's own expectations, as well as their parents' and their teachers' educational expectations for them, respectively.

Table 3.21: Variables measuring the child's own educational expectations

Variable	Coding structure		Wave
	Logistic regression	Structural equation modelling	
How well the study child thinks they are doing at school	Well Average (reference category) Poor	NA	1
How far the study child expects to go in education	Junior Certificate Leaving Certificate Diploma/Cert./Apprenticeship Degree/Post-grad. (ref. cat)	Scale measured in years of education (based on manual for ISCED classification)	2

Table 3.22: Variables measuring the parents' educational expectations for their child

Variable	Coding structure		Wave
	Logistic regression	Structural equation modelling	
How far the primary caregiver expects their child to go in education	Leaving Certificate or earlier Diploma/Cert./Apprenticeship Degree/Post-grad. (ref. cat)	Scale measured in years of education (based on manual for ISCED classification)	1 & 2

Table 3.23: Variables measuring the teachers' educational expectations for the child

Variable	Coding structure: Logistic regression	Coding structure: Structural equation modelling	Wave
Rating of comprehension*	Below average Average Above average	Below average Average Above average	1
Rating of reading*	Below average Average Above average	Below average Average Above average	1
Rating of problem solving*	Below average Average Above average	Below average Average Above average	1
Rating of writing*	Below average Average Above average	Below average Average Above average	1
Rating of mathematics*	Below average Average Above average	Below average Average Above average	1
Rating of oral communications*	Below average Average Above average	Below average Average Above average	1
Rating of imagination/creativity*	Below average Average Above average	Below average Average Above average	1

* the variable "teachers' ratings of the study child's school performance" was formed from these variables and used in the logistic regression and SEM analysis, therefore no reference category is provided for these variables.

Seven variables measured teachers' perceptions of the study child's ability in different areas at wave one (i.e., rating of comprehension, reading, problem solving, writing, mathematics, oral communications, and imagination/creativity). For the purposes of data reduction, principal components analysis was conducted on these seven variables. Prior to performing the principal components analysis, the suitability of the data for factor analysis was assessed and as the correlations between variables were all above r=.5 (Table A3.10 in Appendix A), and the Kaiser-Meyer-Olkin value was 0.902, the data were deemed appropriate for factor analysis (Pallant, 2006). Principal components analysis revealed one component (*teachers' ratings of the study child's school performance;* see Table A3.11 in Appendix A) with eigenvalues exceeding 1 (see Figure A3.1 in Appendix A), explaining 69.14% of the variance.

3.3.4. Attitudes towards school

Few variables in waves one and two of the GUI study measured children's attitudes to school (Table 3.24), therefore the current study focuses on two broad measures of the child's attitude to school: how often/how much they like school (measured at waves one and two) and how often they look forward to school (at wave one only).

Table 3.24: Variables measuring the child's attitude towards school

Variable	Coding structure				Wave
	Logistic regression		Structural equation modelling		
	Wave 1	Wave 2	Wave 1	Wave 2	
The study child likes school	Always Sometimes Never (ref. cat.)	Very much Quite a bit A bit Don't like (ref)	Always Less often (ref)	Very much Quite a bit A bit Don't like I hate it (ref)	1 & 2
The study child looks forward to school	Always Sometimes Never (ref. cat.)		NA		1

3.3.5. Parental involvement in their child's education

As with educational expectations, many different forms or definitions of parental involvement exist in the research literature. Parental involvement may include involvement in school-based activities (e.g., helping out in their child's class or elsewhere in the school, going to parents' evenings or involvement in a Parent-Teacher Association), helping their child with their homework or communicating with their child's teacher (Williams, Williams & Ullman, 2002). In the current study, variables were selected from the GUI database that measured as many of these aspects of parental involvement as possible and include variables that measure parental communication with the child's teacher and principal, involvement in school-based activities and the frequency with which parents help the study child with their homework (Table 3.25). As with other sections, it was considered important to include the reports of individuals from different contexts in the study child's life, therefore both teacher and parent's reports were included, where possible.

Table 3.25: Variables measuring parental involvement with their child's education

Variable	Coding structure: Logistic regression	Coding structure: Structural equation modelling	Wave
Parents have attended a formal meeting with their child's teacher (teachers' report)	No (ref. category) Yes	No (ref. category) Yes	1
Parents have attended a formal meeting with their child's teacher (parents' report)	No (ref. category) Yes	NA	1 & 2
Parents have attended a school concert play or other event	No (ref. category) Yes	No (ref. category) Yes	2
Parents have met the principal about the child's behaviour or school performance	No (ref. category) Yes	No (ref. category) Yes	2
Parents have spoken on the phone with the principal about the child's behaviour or school performance	No (ref. category) Yes	NA	2
How often the parents help their child with their homework	Always Regularly Now and again Rarely/never (ref. cat.)	Scale from 1 (never) to 5 (always)	1 & 2

3.3.6. Child's engagement/meaningful participation

Bronfenbrenner's bioecological model of child development (Bronfenbrenner & Morris, 1998) recognises that children live their daily lives in a multitude of environments. Consequently, in the current study, children's engagement and meaningful participation is considered under three broad headings to reflect the different contexts of children's engagement: the child's lifestyle (i.e., their habits and routine in their daily lives), the child's engagement with their family and the child's engagement in school. Where possible, information on the study child's engagement is collected from the primary caregiver, the study child him/herself and his or her teacher.

Table 3.26 presents the variables that measure the study child's lifestyle at waves one and two. Ten variables were identified that relate to the study child's lifestyle at wave one. One measured the amount of time the study child spends doing things with their friends outside of school, four variables, which were also measured at wave two, relate to daily leisure activities (i.e., time spent watching TV, using a computer, playing video games and reading for pleasure on a normal weekday) and five relate to extra-curricular activities (i.e., participation in sports clubs, cultural activities, youth clubs, scouts/guides and homework club). Principal components analysis was considered for the two set of variables that measured daily leisure activities and extra-curricular activities, separately. While the Kaiser-Meyer-Olkin values were 0.57 and 0.52, respectively, the correlation coefficients between variables were all below *r*=.3, therefore these data were considered to not be suitable for principal components analysis (see tables A3.12 and A3.13 in Appendix A). Each of these variables remained in their original format. As the four variables related to children's daily leisure activities remained in their original format at wave one, principal components analysis was not conducted using these variables at wave two.

Table 3.26: Variables measuring the child's lifestyle

Variable	Coding structure		Wave
	Logistic regression	Structural equation modelling	
Time spent doing things with friends outside of school	Never Rarely Some days Most days Every day (reference category)	Scale from 1 (never) to 5 (every day)	1
Time spent watching TV/video/DVD on a normal weekday	No time (reference category) Less than one hour One hour or more	NA	1 & 2
Time spent reading for pleasure on a normal weekday	No time (reference category) Less than one hour One hour or more	Scale from 0 – 7 hours	1 & 2
Time spend using computer on a normal weekday	No time (reference category) Less than one hour One hour or more	NA	1 & 2
Time spent playing video games on a normal weekday	No time (reference category) Less than one hour One hour or more	No time (ref. category) Less than one hour One hour or more	1 & 2
Participates in sports	No (reference category) Yes	No (reference category) Yes	1
Participates in cultural activities	No (reference category) Yes	No (reference category) Yes	1 & 2
Participates in youth club	No (reference category) Yes	NA	1
Participates in scouts/guides	No (reference category) Yes	NA	1 & 2
Participates in homework club	No (reference category) Yes	No (reference category) Yes	1 & 2
Participates in a regular leisure activity	No (reference category) Yes	NA	2
Plays sports as part of a team or with a coach	No (reference category) Yes	NA	2
Plays sports/physical activities without a coach	No (reference category) Yes	No (reference category) Yes	2

Given the important role of the child's family environment in the educational resilience literature, it was deemed important to explore the child's engagement with their immediate and extended family separately from other forms of engagement. Table 3.27 presents the variables measuring the child's engagement with their family selected at waves one and two.

At wave one, 18 variables were identified that were related to the study child's engagement with their family. Of these, nine variables measured the study child's reports of how they spent their time with their parents in the last week and five variables measured the primary caregiver's reports of how they spent their time with their child (Table 3.27). Principal components analysis was considered for these two sets of variables separately (i.e., child's reports and parent's reports). While the Kaiser-Meyer-Olkin values for the child reported and primary caregiver reported variables were 0.624 and 0.660, respectively, principal components analyses was deemed inappropriate given that all correlation coefficients for correlations between variables were below r=.3 (see tables A3.14 and A3.15). Therefore these 14 variables remained in their original format. The five variables measuring the primary caregiver's reports of how they spent their time with their child were also measured at wave two, but as they remained in their original format in wave one, principal components analysis was not conducted using these variables at wave two.

Three of the variables measuring family engagement measured the amount of time the study child spends with grandparents; uncles and aunts; and cousins (these three variables in addition to a variable measuring time spent with other family members were also measured at wave two). Principal components analysis was conducted on these variables (at waves one and two) for the purposes of data reduction. Prior to performing the principal components analysis the suitability of the data for factor analysis was assessed. The correlation coefficients between the variables were all above r=.3 (see tables A3.16 and A3.17), and the value for the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.600 at wave one and 0.717 at wave two, therefore the data were deemed appropriate for factor analysis. Principal components analysis revealed one component, *time spent with extended family*, with eigenvalues exceeding 1 at both waves (figures A3.2 and A3.3), explaining 64.8% of the variance at wave one and 58.4% at wave two (see tables A3.18 and A3.19 for the component matrix for the extracted components).

Table 3.27: Variables measuring the child's engagement with family

Variable	Coding structure: Logistic regression	Coding structure: Structural equation modelling	Wave
How often the child feels they have a say in family decisions	Always Sometimes Never (reference category)	Always Less often (ref. category)	1
Time spent eating with parents in the last week (child report)	No (reference category) Yes	NA	1
Time spent visiting relatives with parents in the last week (child)	No (reference category) Yes	NA	1
Time spent watching TV with parents in the last week (child)	No (reference category) Yes	NA	1
Time spent chatting with parents in the last week (child)	No (reference category) Yes	NA	1
Time spent going to the park with parents in the last week (child)	No (reference category) Yes	NA	1
Time spent going swimming with parents in the last week (child)	No (reference category) Yes	NA	1
Time spent playing games at home with parents in the last week (child)	No (reference category) Yes	NA	1
Time spent playing games outside with parents in the last week (child)	No (reference category) Yes	NA	1
Time spent reading something with parents in the last week (child)	No (reference category) Yes	NA	1
Time spent eating with child (parent report)	Every day 3 to 6 days < 2 days (reference category)	NA	1 & 2
Time spent playing games with child (parent report)	Every day 3 to 6 days < 2 days (reference category)	NA	1 & 2
Time spent talking about things with child (parent report)	Every day 3 to 6 days < 2 days (reference category)	Every day Less often (ref. category)	1 & 2
Time spent doing household activities with child (parent report)	Every day 3 to 6 days < 2 days (reference category)	NA	1 & 2
Time spent going on an outing with child (parent report)	Every day 3 to 6 days < 2 days (reference category)	NA	1 & 2
Time spent with uncles and aunts*	Quite a lot of time Now and again Rarely	NA	1 & 2
Time spent with cousins*	Quite a lot of time Now and again Rarely	NA	1 & 2
Time spent with grandparents*	Quite a lot of time Now and again Rarely	NA	1 & 2
Time spent with other family*	Quite a lot of time Now and again Rarely	NA	2

* the variable 'time spent with extended family' was formed from these variables and used on the logistic regression and SEM analysis, therefore no reference category is provided for these variables.

As the current study is specifically examining academic resilience, it was deemed appropriate to explore the study child's engagement in school related activities separately to their engagement in other activities. Table 3.28 displays the variables that were selected to measure the study child's engagement in school at waves one and two. All selected variables are measures of the child's level of *disengagement* from school and therefore the remainder of the analysis in the current study refers to the child's disengagement from rather than engagement in school. As with other factors, where possible, measures were taken from a number of different sources (i.e. the child, their parents and teachers).

Seven variables (the child was late for school, the child was in trouble for breaking rules, the child skipped classes, the child messed in class, the child had to do extra work as punishment, the child had to do detention and the child was suspended from school) measured the child's reported disengagement behaviours at wave two. Principal components analysis was considered for these seven variables for the purposes of data reduction. Prior to principal components analysis the suitability of the data for factor analysis was assessed and given that the correlations between variables were mostly above r=.3 (Table A3.20), and the Kaiser-Meyer-Olkin value was 0.825, the data were deemed appropriate for factor analysis (Pallant, 2006). Principal components analysis revealed one component (*disengagement from school*) with eigenvalues exceeding 1 (see Figure A3.4 and Table A3.21 in Appendix A), explaining 41.28% of the variance.

Table 3.28: Variables measuring the child's engagement with school

Variable	Coding structure: Logistic regression	Coding structure: Structural equation modelling	Wave
Number of days during the last school year that the study child was absent from school (parent report)	None 1 to 3 days 4 to 6 days 7 to 10 days More than 10 days (ref. cat)	NA	1 & 2
Number of days that the study child was absent from school (teacher report)	Scale (measured in days)	NA	1
How often the study child arrives at school with incomplete homework (teacher report)	Never Occasionally (ref. category) Regularly	Regularly (reference cat.) Less often	1
Child was late for school*	Never Now and again Quite often All times	Never Now and again Quite often All times	2
Child got into trouble for not following school rules*	Never Now and again Quite often All times	Never Now and again Quite often All times	2
Child skipped classes or mitched*	Never Now and again Quite often All times	Never Now and again Quite often All times	2
Child 'messed' in class*	Never Now and again Quite often All times	Never Now and again Quite often All times	2
Child had to do extra homework as punishment*	Never Now and again Quite often All times	Never Now and again Quite often All times	2
Child has to do detention (after school or at lunch time)*	Never Now and again Quite often All times	Never Now and again Quite often All times	2
Child was suspended from school*	Never Now and again Quite often All times	Never Now and again Quite often All times	2

* the variable 'disengagement from school' was formed from these variables and used on the logistic regression and SEM analysis, therefore no reference category is provided for these variables.

3.3.7. Personal attributes of the child

In order to gain a fuller understanding of the influence of the personal attributes of the child on academic resilience, these attributes are analysed under two general headings in the current study: child's psychological adjustment (in terms of their behaviour and temperament) and the child's self-concept. As with the other measures, information gathered from the study child's parents, teachers and from the study child him/herself, was used where possible.

Table 3.29 presents the variables (i.e. the six subscales of the Piers Harris Children's Self-concept scale) that measure the child's self-concept at waves one and two.

Table 3.29: Variables measuring the personal attributes of the child – self-concept

Variable	Coding structure		Wave
	Logistic regression	Structural equation modelling	
Behavioural adjustment	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	1 & 2
Intellectual and school status	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	1 & 2
Physical appearance and attributes	Scale (mean = 0; SD = 1)	NA	1 & 2
Freedom from anxiety	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	1 & 2
Popularity	Scale (mean = 0; SD = 1)	NA	1 & 2
Happiness and satisfaction	Scale (mean = 0; SD = 1)	NA	1 & 2

Table 3.30 presents the variables that measure the child's behaviour and temperament at waves one and two. These variables include the five subscales that form the Strength and Difficulties Questionnaire (SDQ, with separate reports for each subscale by the parent and teacher at wave one); the four subscales of the Emotionality, Activity and Sociability Temperament Scale (EAS; at wave one only); the five subscales that form the Ten Item Personality Inventory (TIPI; at wave two only); and the low mood or depression indicator as measured by the Short Mood and Feelings Questionnaire (SMFQ).

Table 3.30: Variables measuring the personal attributes of the child – psychological adjustment

Variable	Coding structure		Wave
	Logistic regression	Structural equation modelling	
Emotional symptoms (SDQ parent)	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	1 & 2
Conduct problems (SDQ parent)	Scale (mean = 0; SD = 1)	NA	1 & 2
Hyperactivity/inattention (SDQ parent)	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	1 & 2
Peer relations problems (SDQ parent)	Scale (mean = 0; SD = 1)	NA	1 & 2
Prosocial behaviour (SDQ – parent)	Scale (mean = 0; SD = 1)	NA	1 & 2
Emotional symptoms (SDQ teacher)	Scale (mean = 0; SD = 1)	NA	1
Conduct problems (SDQ – teacher)	Scale (mean = 0; SD = 1)	NA	1
Hyperactivity/inattention (SDQ teacher)	Scale (mean = 0; SD = 1)	Scale (mean = 0; SD = 1)	1
Peer relations problems (SDQ teacher)	Scale (mean = 0; SD = 1)	NA	1
Prosocial behaviour (SDQ teacher)	Scale (mean = 0; SD = 1)	NA	1
Shyness (EAS)	Scale (mean = 0; SD = 1)	NA	1
Emotionality (EAS)	Scale (mean = 0; SD = 1)	NA	1
Activity (EAS)	Scale (mean = 0; SD = 1)	NA	1
Sociability (EAS)	Scale (mean = 0; SD = 1)	NA	1
Openness (TIPI)	Scale (mean = 0; SD = 1)	NA	2
Conscientiousness (TIPI)	Scale (mean = 0; SD = 1)	NA	2
Extraversion (TIPI)	Scale (mean = 0; SD = 1)	NA	2
Agreeableness (TIPI)	Scale (mean = 0; SD = 1)	NA	2
Emotional Stability (TIPI)	Scale (mean = 0; SD = 1)	NA	2
Depression (SMFQ)	Scale (mean = 0; SD = 1)	NA	2

3.4. Analysis strategy

This section provides a description of the analysis that will form the basis of the remainder of this study. Three aims are outlined for this study:

1) Identify and describe more academically resilient children at ages nine and 13;
2) Identify unique predictors of academic resilience in the GUI child cohort sample at ages nine and 13 (according to the classifications identified in section 3.3) using logistic regression analysis;
3) Develop a multi-dimensional model of academic resilience based on the resilience and education literature; apply the unique predictors of academic resilience identified in step two (at age nine and 13) to this model and test the model at nine and 13 years old using structural equation modelling.

3.4.1. Aim 1: Identify and describe academic resilience

As outlined in Chapter 2, definitions of resilience, both in general and in the field of education, vary considerably between studies. However, it is generally agreed that all of the various descriptions of resilience take account of overcoming some kind of challenge, stress or adversity (Luthar, Cichetti & Becker, 2000; Rigsby, 1994). Therefore, identifying individuals who have experienced adversity is the first step when considering more resilient students. The current study aims to explore academic resilience among children at risk of poverty, as children at risk of poverty have been found to have considerably poorer educational outcomes (see Chapter 1).

In Ireland, children whose families have access to a medical card are considered to be at risk of poverty. Although medical card possession is not synonymous with poverty, the vast majority of families with school-going children that hold medical cards do so because of low income (Sofroniou, Archer & Weir, 2004). In most cases, eligibility to receive a medical card depends on an assessment of the cardholder's means, with weekly income limits for families with dependent children set at between €266 and €298 (Government of Ireland, 2013).[6,7,8] Medical card possession has also been found to be associated with poorer educational outcomes in Ireland (Eivers, Shiel & Shortt, 2004). Given the strong relationship between medical card possession and achievement in Ireland, as well as the fact that those who qualify for a full medical card have low weekly incomes, children at risk of poverty are defined as those whose family has access to a full medical card. In the current study, children whose families have access to a full medical card are compared to those who do not have access to a full medical card in terms of their reading and mathematics performance (verbal reasoning and numerical ability at 13 years old), their family's mean equivalised income (taking household size and structure into account) and household social class (based on parental occupation), to

[6] The assessment of income also takes account of the number of children who are financially dependent on the applicant; rent and mortgage payments; childcare costs; and the cost of travelling to work (Government of Ireland, 2013)

[7] In a small number of cases (5.5% of cases in 2012), cards can be awarded on a discretionary basis (i.e., where means exceed the limits set but where not awarding a medical card would result in it being unduly burdensome to that person to provide GP services to him/herself and his/her family (Government of Ireland, 2013).

[8] The HSE also operates a long term illness scheme, which is not related to income and operates separately to the medical card/GP visit card (Government of Ireland, 2013).

establish if differences in levels of educational achievement and socioeconomic status exist between these subgroups in the GUI samples.

In the current study, more academically resilient children are defined as those whose reading and mathematics scores at age nine and verbal reasoning and numerical ability at age 13 are at least half a standard deviation above the average scores of all children in the GUI child cohort sample. The benchmark of half a standard deviation above the mean is also used in identifying higher achieving students in standardised assessments. For example in the DPRT-R and DPMT-R, students who achieve Sten scores of 7 or above (i.e. at least a half a standard deviation above the mean) are labelled as high-average or well above average students. Also, it was deemed appropriate to select children who show considerable strength in both areas of reading and mathematics, as these children display general academic skill rather than strength in a particular assessment area.

A comparison group of academically vulnerable children were also identified. These children are defined as children whose families have access to a full medical card and whose reading and mathematics scores (verbal reasoning and numerical ability at age 13) are at the average for children whose families have access to a full medical card or below. More academically resilient and vulnerable children are compared to each other, as well as to other medical card holders and non-medical card holders, in terms of their reading and mathematics performance (verbal reasoning and numerical ability at age 13), household equivalised income and social class.

3.4.2. Aim 2: Identify unique predictors of academic resilience at age nine and 13

The second aim of this study is to identify unique predictors of academic resilience at nine and 13 years old. Unique predictors are those that remain significant predictors of academic resilience when other related factors, also associated with academic resilience, are accounted for and these predictors will form the basis of the models of academic resilience at ages nine and 13 (specified in aim 3 of the analysis strategy). Logistic regression is used to identify the factors that distinguish more academically resilient children from academically vulnerable children among a sample of children at risk of poverty. Hypothesised predictors were tested separately first and then tested together to ensure the most prominent variables were selected for structural equation modelling. As the purpose of the analyses was to identify which factors distinguish more academically resilient children from academically vulnerable children, all other children with access to a medical card (and who were not categorised as more academically resilient nor vulnerable) were excluded from this analysis.

Logistic regression analysis was preferred over discriminant analysis in the current study as it does not rely on some of the assumptions on which discriminant analysis is based (i.e. that attributes are multivariate normally distributed and there is homogeneity of variance) and therefore is considered less restrictive (Leech, Barrett & Morgan, 2011; Grimm & Yarnold, 1995). For these reasons it was considered to be a more appropriate method of analyses. Also, logistic regression is favoured over discriminant analysis when the model contains a mixture of continuous and discrete variables, as the discriminant function estimators overestimate the magnitude of the association (Hosmer & Lemeshow, 1989).

Assumptions of logistic regression include that, firstly, the outcome variable is a dichotomous variable taking the value 1 with probability P_1 and the value 0 with probability P_0=1-P_1; secondly, the outcomes must be statistically independent (i.e. a single case can be represented in the data set only once); thirdly, the model must be correctly specified (i.e. the model contains all relevant predictors and no irrelevant predictors); finally, the categories under analysis must be mutually exclusive and collectively exhaustive (i.e. a case cannot be a member of more than one outcome category at a time and must be a member of one of the categories under analysis (Grimm & Yarnold, 1995). It has been noted that larger samples are required for logistic regression analysis, because the standard errors for maximum likelihood coefficients are large-sample estimates (Grimm & Yarnold, 1995; Leech et al., 2011). Leech et al. (2011) suggest a minimum of 20 cases per predictor (with a minimum of 60 total cases), while Grimm and Yarnold (1995) indicate that a minimum of 50 cases per predictor variable is sufficient.

In step 1 of the analysis strategy, each student is identified as either more academically resilient (i.e., holders of a full medical card and have reading and mathematics scores that are a half a standard deviation or more above the averages for all children), or more academically vulnerable (i.e., holders of a medical card and have reading and mathematics scores that are at or below the averages for full medical card holders). Therefore, assumptions one and four are met as the outcome variable is dichotomous and it is not possible for a student to be more academically resilient and vulnerable. In the GUI wave one dataset, each study child is only represented once therefore assumption two has also been met. The variables identified in Section 3.3 are based on a review of the educational and resilience literature and are considered to be theoretically important predictors. Given the large number of variables included in the analysis, it is intended to exclude any variables that are not unique predictors of academic resilience (i.e. variables that do not remain statistically significant when other variables are entered into the model). In this way, it is suggested that the most important predictors will contribute to the model, therefore adhering to assumption three. Grimm and Yarnold (1995) note, however, that the specificity assumption is rarely met.

To ensure that all factors associated with academic resilience received adequate attention, logistic regression analyses were conducted separately under seven main categories outlined in Section 3.3 of this chapter: background characteristics; relationships with family, teachers and peers; educational expectations; attitudes towards school; parental involvement in their child's education; engagement and meaningful participation; and the personal attributes of the child. As recommended by Aitkin, Francis and Hinde (2005), and as with previously-reported hierarchical linear models of Irish students, no sampling weights are used (e.g., Cosgrove et al., 2005) in the logistic regression analysis.

3.4.3. Aim 3: Develop and test a multi-dimensional model of academic resilience

The third aim of the current study is to develop a model of academic resilience that brings together factors associated with academic resilience from across a child's life, and to test this model at age nine and 13. This model, referred to as the theoretical model in the current study, is based on a review of the relevant resilience and education literature outlined in chapters 1 and 2. The unique predictors of academic resilience identified under aim two of the analysis strategy were applied to the theoretical model of academic resilience and two separate hypothesised models of academic resilience (one at age nine and one at age 13) were tested using structural equation modelling with data from all children at risk of poverty in the GUI dataset (i.e., full medical card holders) at waves one and two of the child cohort.

Many aspects of structural equation modelling (SEM) distinguish it from other multivariate procedures and make it the preferred choice of analysis for the third aim of the current study. Firstly, SEM takes a confirmatory approach to the analysis of a structural theory bearing on some phenomenon, i.e., it requires that the patterns of intervariable relations be specified a priori. Once the model is specified, its plausibility is then tested based on sample data that comprise all observed variables in the model. SEM also provides explicit estimates of measurement error, which traditional multivariate procedures are not capable of assessing or correcting for (Byrne, 2012). SEM procedures can also incorporate both unobserved (i.e., latent) and observed variables.

When using SEM procedures a number of issues should be considered. As SEM is a confirmatory technique, prior knowledge of, or hypotheses about, potential relationships among variables is necessary. While some level of exploratory analysis is possible using SEM, researchers must be careful to protect against inflated Type I error if numerous modifications of a model are tested. Where possible, cross validation with another sample is recommended. Also, while SEM can sometimes be referred to as causal modelling, it should be noted that attributing causality is a design issue and not a statistical one (Ullman, 2014).

The adequacy of SEMs is assessed by the goodness of fit between the hypothesised model and the sample data (i.e., how well the observed covariance matrix for the variables in our model matches that which we would expect if the model was a true representation of the data). The chi-square statistic is the most basic fit statistic for any path analysis model. If the chi-square statistic is significant, this indicates that the relationships between the variables in the model are significantly different from what would be expected if the model was a true representation. However, when the sample is even moderately large, differences between the observed and expected covariance matrices that are small enough to be considered trivial can cause very significant chi-square statistics. A method of dividing the chi-squared value by degrees of freedom norms the chi-squared figure and can be used to assess model fit (Wheaton, Muthen, Alwin & Summers, 1977).

Also, other indices have been developed to assess model fit. These indices can be classified into two types: absolute fit indices (i.e., how the model compares against the perfect model) and incremental fit indices (i.e., how much of an improvement is the model from the null model) (Stride, 2015). Hu and Bentler (1999) suggest that to minimise Type I and Type II errors, researchers should use a combination of one incremental fit index (typically the Comparative Fit Index [CFI]) and one of two absolute fit indices (either the Standardised Root Mean Square Residual [SRMR] or the Root Mean Square of Error Approximation [RMSEA]).

Three measures of model fit are used in the current study (the normed chi-square; the CFI and the RMSEA) and Table 3.31 presents the recommended cut-off values for each.

Table 3.31: Model fit statistics and associated cut-off values used in the current study

Model fit statistic	Recommended Cut-off value	Reference
Chi-square (normed)	Up to 3	Wheaton et al. (1977)
Comparative Fit Index (CFI)	>.95	Yu (2002)
Root Mean Square of Error Approximation (RMSEA)	<.06	Yu (2002)

3.5. Conclusions

This chapter provided an overview of the Growing Up in Ireland study, including the sampling methods used, response rates and descriptions of the scales measured as part of that study and also used in the current study. The reliability of scales, using the full sample and the medical card sample was also established. It should be noted that many of the scales measured in the GUI study displayed less than adequate internal consistency (i.e., a Cronbach's alpha of below 0.7) for the whole sample but also for the sample of children with access to a medical card. This can be considered a weakness of many large scale studies where measures developed with one sample may not be as reliable when used with samples in different context. The findings in the current study suggests that some measures used in GUI may not be as reliable for the GUI sample and therefore caution must be exercised when interpreting results as the measurement error associated with these measures may be higher than in the studies for which the measures were originally developed. This chapter also lists all variables selected from the GUI study for the purpose of analysis in the current study. The chapter finishes by outlining the analysis strategy of the current study.

The following chapters outline the results of the analytic strategy described here. Chapter 4 begins by identifying and describing more academically resilient children and comparing them to more vulnerable children in terms of their performance on cognitive tests but also in terms of their household income, parental education level and social class (Aim 1 of the analytic strategy). Chapter 4 goes on to identify unique predictors of academic resilience at ages nine and 13 using logistic regression analysis (Aim 2 of the analytic strategy). The variables identified in Section 3.3 of this chapter are first tested as predictors of academic resilience on their own, and then tested with other variables thought to measure the same underlying construct to identify the most prominent predictors of academic resilience.

A model of academic resilience, that is based on the educational and resilience literature, and that hypothesises the pathways through which resilience manifests, is described in Chapter 5. Each of the factors that remain as significant predictors of academic resilience when other factors (that are thought to measure the same underlying construct) are accounted for are applied to this model of academic resilience. The model is tested at ages nine and 13 using structural equation modelling (Aim 3 of the analytic strategy). Chapter 6 considers the main findings and implications of the results of the current study.

Chapter 4. Results – Identifying and describing academic resilience

The purpose of the current study is to identify children demonstrating greater levels of academic resilience among a sample of children at risk of poverty in Ireland, identify the factors associated with academic resilience among these children and examine the pathways through which these factors can contribute to academic resilience. While some studies examine specific aspects of academic resilience (e.g., the relationship between parental involvement in their child's education and academic resilience) few bring together the resilience literature in a more comprehensive way to develop and test a multi-dimensional model of academic resilience. This study aims to develop a multi-dimensional model of academic resilience based on the literature and to examine if the same predictors of academic resilience (and the associated processes between them) apply at difference time points (specifically age nine and age 13) in a child's development.

This chapter presents the results for aims 1 and 2 of the analysis strategy outlined in Chapter 3. In the current study, academic resilience is defined as better than expected academic achievement outcomes among children at risk of poverty. As a first step, children who are considered to be at risk of poverty were identified and then classified as more academically resilient, vulnerable or other (children who are considered to be at risk of poverty but not classified as academically resilient or vulnerable). These subgroups of children are described (at both nine and 13 years old), in terms of their academic achievement as well as the income and the social class category of their household. Comparisons are made between the different groups of children to test the assumptions that children classified as at risk of poverty have access to less family income and are underperforming academically relative to national means; and that children classified as more academically resilient are performing at much higher levels academically than expected despite their experience of economic adversity (when compared to the national mean).

Secondly, using logistic regression, unique predictors of academic resilience were identified among children at age nine and also at age 13. Unique predictors are those that remain significant predictors of academic resilience when other related factors, also associated with academic resilience, are accounted for. These predictors will form the basis of the models of academic resilience at ages nine and 13 that will be outlined in Chapter 5. Predictors of academic resilience were identified under seven main categories, all considered to be key areas of a child's life that are associated with academic resilience: background characteristics; relationships with family, teachers and peers; educational expectations; attitudes towards school; parental involvement in their child's education; engagement and meaningful participation; and the personal attributes of the child.

4.1. Identifying and describing academic resilience

This section describes children identified as demonstrating greater levels of academic resilience at nine and 13 years old, presented separately. As full medical card[9] status is the indicator of poverty used in the current study, children whose families have access to a full medical card are described first and compared to all other children as well as to the whole sample of children. To test the assumption that children at risk of poverty are performing less well academically relative to national averages, the subgroups of children are described in terms of their performance on the Drumcondra Primary Reading Test (DPRT-R) and Drumcondra Primary Mathematics Test (DPMT-R) at age nine years and the Drumcondra Reasoning Test (DRT) in verbal reasoning and numerical ability at age 13 years. The subgroups of children are also compared in terms of their family's mean equivalised income (taking household size and structure into account[10]) and household social class at both age levels to establish if differences in levels of socioeconomic status exist between the subgroups.

[9] In the current study, having access to a medical card refers to those who have access to a full medical card and does not include those who have access to a GP Visit Card.

[10] An equivalence scale was used to assign a 'weight' to each household member. The equivalence scale assigned a weight of 1 to the first adult in the household, 0.66 to each subsequent adult (aged 14+ years) and 0.33 to each child (aged less than 14 years) living in the household (ESRI, 2010b).

Children are then classified as more academically resilient, academically vulnerable, other medical card holders and non-medical card holders using the following definitions:

Inset 4.1.

Children classified as academically resilient are those children whose families have access to a medical card and whose scores on tests of literacy and numeracy are at least half a standard deviation above the mean performance of all children. Literacy and numeracy were measured using the Drumcondra reading and mathematics test scores at age nine, and the Drumcondra verbal reasoning and numerical ability test scores at age 13. These children are referred to as those classified as **resilient** in the remainder of the chapter.

Children classified as academically vulnerable are those whose families have access to a medical card and whose scores on tests of literacy and numeracy are the same as or below the mean literacy and numeracy scores for all children whose families have access to medical card. Literacy and numeracy were measured using the Drumcondra reading and mathematics test scores at age nine, and the Drumcondra verbal reasoning and numerical ability test scores at age 13. These children are referred to as those classified as **vulnerable** in the remainder of the chapter.

Other medical card holders are children whose families have access to a medical card and whose scores on tests of literacy and numeracy are between the mean for all medical card holders and half a standard deviation above the mean for all children (i.e., children who have access to a medical card but who are not classified as resilient or vulnerable). Literacy and numeracy were measured using the Drumcondra reading and mathematics test scores at age nine, and the Drumcondra verbal reasoning and numerical ability test scores at age 13.

Non-medical card holders are children whose families do not have access to a medical card. This category includes some children whose families have access to a GP Visit Card. Children in this category are not considered to be at risk of poverty. [11]

[11] Non-medical card holders includes 247 (2.9% of children) whose families have access to a GP Visit Card, one child whose family is unsure whether they have access to any form of medical card, and 5,919 children whose families do not have access to any form of medical card.

Applying the definitions outlined in Inset 4.1, children classified as resilient and vulnerable children as well as other medical card holders and non-medical card holders are selected separately for each age group. Children in these subgroups are also compared in terms of their reading and mathematics performance (verbal reasoning and numerical ability at age 13), household equivalised income and social class.

As the scores of medical card holders (and included in this category, children classified as resilient and vulnerable) contribute to the national means (i.e., the scores of children classified as resilient and vulnerable children form part of national means), tests of significance are not conducted on comparisons between the mean scores of these children and national means. Instead, general observations are made on the size of the difference, in terms of the standard deviation. Data are weighted using the Wgt_9yr weight for wave one (nine years old) and Wgt_13yr at wave two (13 years old).

4.1.1. Children whose families have access to a medical card

This section describes children whose families have access to a medical card at age nine and those who have access at age 13. These children are described (at both nine and 13 years old), in terms of their academic achievement as well as the income and the social class category of their household.

<u>Age nine</u>

In the first wave of the child cohort component of the Growing Up in Ireland (GUI) study, 8,568 children participated and, of these, 8,326 (or 97.2%) completed the Drumcondra mathematics and reading assessments. Of the children who completed the reading and mathematics assessments, 27.8% came from families with a medical card (Table 4.1). A slightly lower percentage of children with access to a medical card were boys (47.0%) compared to the overall sample (51.1%). This may suggest that boys from poorer backgrounds are somewhat underrepresented in the GUI sample. These children had mean reading and mathematics scores[12] (58.7 and 45.3, respectively) that are significantly below the mean scores of all other

[12] Children's scores on the DPRT-R and the DPMT-R are reported in terms of percent correct scores, i.e., the number of questions answered correctly by the child as a percentage of all items on the test.

children (71.0 for reading and 56.9 for mathematics) and are also below the national mean scores[13] for reading and mathematics (67.6 and 53.7, respectively).

Table 4.1: Mean reading and mathematics scores at age nine, overall and by medical card status

			Reading			Mathematics		
	N	%	Mean	SE	SD	Mean	SE	SD
All children	8326	100.0	67.6	0.24	21.80	53.7	0.23	21.52
Medical card	2318	27.8	58.7	0.47	22.60	45.3	0.44	21.29
All other children	6007	72.2	71.0	0.26	20.49	56.9	0.27	20.73
Mean score differences								
			Diff	SED	CI95	Diff	SED	CI95
Medical card – all other children			12.3	0.54	(**11.23, 13.37**)	11.60	0.52	(**10.57, 12.63**)

While having access to a medical card is not synonymous with poverty there is a link between income and medical card status. The families of children who have access to a medical card have significantly lower equivalised incomes when compared to the families of all other children (Table 4.2), supporting the claim that these children's families are less economically advantaged than other children.

Table 4.2: Mean equivalised household income at age nine, overall and by medical card status

	N	%	Mean (€)	SE	SD
All children	7787	100.0	18,961.5	140.57	12,404.3
Medical card	2211	28.4	11,907.6	137.15	6,449.8
All other children	5576	71.6	21,759.0	175.04	13,070.6
Mean score differences					
			Diff	SED	CI95
Medical card – all other children			-9851.40	222.38	(**-10180, -9523**)

In the GUI study, social class is measured according to the occupation of the child's parents and three categories of occupation are specified: professional/managerial, other non-manual/skilled manual and semi-skilled/unskilled manual. There is a significant relationship between having access to a medical card and parental occupation, χ^2 (2; N=7,337) = 672.67, $p< .001$ (see Table A4.1 in Appendix B). Children whose families had access to a medical card are less likely than expected to belong to the 'professional/managers' social class category and are more likely than expected to belong to the semi-skilled/unskilled manual category (Table 4.3).

[13] In the current study, national mean scores refer to the mean scores of all available children in the GUI database and does not refer to national norms.

Table 4.3: Percentage of nine-year-old children who belong to each household class category, overall and by medical card status

	All children			Medical card			All other children		
	N	%	SE	N	%	SE	N	%	SE
Professional/managers	3460	47.2	0.01	326	21.7	0.01	3134	53.7	0.01
Other non-manual/ skilled manual	2970	40.5	0.01	752	50.3	0.01	2218	38.0	0.01
Semi-skilled/unskilled manual	906	12.4	0.00	419	28.0	0.01	488	8.3	0.00
Total	7336	100.0	-	1497	100.0	-	5840	100.0	-

The School Support Programme under DEIS is an initiative by the Department of Education and Skills (DES) aimed at addressing the needs of students experiencing social marginalisation in education at both primary and post-primary level is. Schools were considered for inclusion in this initiative based on estimates of socioeconomic, demographic and educational indicators (see Chapter 1). At primary level, there are three levels of DEIS status: DEIS Urban Band 1 (school with the greatest concentration of children experiencing social marginalisation), DEIS Urban Band 2 and DEIS rural. A much greater proportion of children who had access to a medical card attended DEIS Urban Band 1 schools compared to children who did not have access to a medical card (17.5% compared to 4.8%; Table 4.4). However, the vast majority of children with access to a medical card did not attend a school receiving support under the DEIS initiative (66.5%), indicating that many of the children at risk of poverty in this study are in schools where many of their classmates are not considered to be at risk of poverty.

Table 4.4: Percentage of nine-year-old children who attended schools according to DEIS category, overall and by medical card status

	All children			Medical card			All other children		
	N	%	SE	N	%	SE	N	%	SE
DEIS urban band 1	693	8.3	0.00	406	17.5	0.01	287	4.8	0.00
DEIS urban band 2	497	6.0	0.00	207	8.9	0.01	290	4.8	0.00
DEIS rural	353	4.2	0.00	163	7.0	0.01	189	3.2	0.00
Non-DEIS	6783	81.5	0.00	1542	66.5	0.01	5241	87.2	0.00
Total	8326	100	-	2318	100	-	6007	100	-

Age 13

Of the 8,568 children who participated in wave one (at age nine) of the child cohort component of the GUI study, 7525 or 87.8% (weighted) of children also participated in wave two (at age 13). Of the 1,043 children who did not take part in wave two, 40.2% had access to a medical card and 2.8% were classified as being resilient at age nine, indicating a greater attrition rate among children at risk of poverty.

Of those who also participated in wave two, 7,099 or 94.3% completed the Drumcondra verbal reasoning and numerical ability tests at age 13. There was almost an even proportion of boys and girls (50.7% boys and 49.3% girls) among children who completed the tests at wave two. The mean scores[14] for all children were 60.2 for verbal reasoning and 50.4 for numerical ability (Table 4.5). Thirty-four percent of children had access to a medical card at age 13 and, of these, 46.3% were boys and 53.7% were girls, again suggesting that boys from poorer backgrounds may be underrepresented in the GUI sample at wave 2. The mean scores for these children were 51.6 for verbal reasoning and 42.3 for numerical ability, which are both over a third of a standard deviation below the corresponding national means, indicating that children with access to a medical card are performing less well academically.

There have been some changes in the medical card status of children between wave one and wave two of the GUI study. A greater proportion of children had access to a medical card at age 13 than at age nine (34% compared to 26%) however, both groups of children had similar mean verbal reasoning and numerical ability scores at age 13 (Table 4.5). Thus, while more children were classified as being at risk of poverty at age 13, these children showed similar levels of academic performance to their counterparts at age nine.

Of those who completed the Drumcondra tests, 22.2% had access to a medical card at both age nine and age 13; 4.0% had access to a medical card at age nine but not at age 13; 11.9% did not have a medical card at age nine but did have access to one at age 13; and 61.9% did not have a medical card at either age nine or age 13 (Table 4.5). Those who had access to a medical card at age nine years but not at 13 years had a mean verbal reasoning score of 58.8, which is somewhat higher than the mean verbal reasoning score of those who have access to a medical card at age 13 years but not at age nine years (55.4). On the other hand, children who had access to a medical card at age nine years but not at age 13 had a similar mean numerical ability score to those who had access at age 13 years but not at age nine (45.7 and 45.9, respectively). This indicates that those who have lost or gained their medical card access between the two waves of the study are very similar to each other in terms of their academic achievement. On the other hand, those who retained their medical card status between the two

[14] Thirteen-year-old children's scores on the Drumcondra verbal reasoning and numerical ability tests are reported in terms of the percentage of items answered correctly.

waves of the study had the lowest achievement scores (49.5 for verbal reasoning and 40.4 for numerical ability; Table 4.5) indicating that they are among the lowest-achieving children (and they are also more likely to have experienced persistent poverty, given that they have retained their medical card status).

Table 4.5: Mean verbal reasoning and numerical ability percent correct scores at age 13, overall and by medical card status

			Verbal reasoning			Numerical ability		
	N	%	Mean %	SE	SD	Mean %	SE	SD
All children	7099	100	60.2	0.27	22.99	50.4	0.28	23.20
Age 13 years old								
Medical card	2424	34.1	51.6	0.48	23.65	42.3	0.45	22.21
All other children	4674	65.8	64.7	0.31	21.31	54.5	0.33	22.60
Age 9 years old								
Medical card	1861	26.2	50.9	0.54	23.49	41.3	0.50	21.63
All other children	5238	73.8	63.5	0.30	21.89	53.6	0.32	22.88
Medical card at age nine and at age 13	1578	22.2	49.5	0.59	23.45	40.4	0.54	21.51
Medical card at age nine but not age 13	283	4.0	58.8	1.31	22.10	45.7	1.29	21.70
No medical card at age nine but medical card at age 13	846	11.9	55.4	0.81	23.55	45.9	0.79	23.05
No medical card at age nine or age 13	4391	61.9	65.1	0.32	21.20	55.1	0.34	22.54

Thirteen-year-old children who had access to a medical card performed significantly less well than those who did not have access to a medical card on both verbal reasoning (difference=13.10; SE difference=0.57) and numerical ability (difference=12.20; SE difference=0.56). As at age nine, thirteen-year-old children who had access to a medical card had significantly lower equivalised household income than those who did not have access to a medical card (Table 4.6). Also, there is a significant relationship between having access to a medical card and parental occupation, χ^2 (2, N=6,447) = 846.47, p< .001. Children whose families had access to a medical card were less likely than expected to belong to the 'professional/ managers' social class category and were more likely than expected to belong to the 'other non-manual/skilled and semi-skilled/unskilled manual categories (see Table A4.2 in Appendix B; Table 4.7).

Table 4.6: Mean equivalised income at age 13, overall and by medical card status

	N	%	Mean (€)	SE	SD
All children	6576	100.0	16,145.14	120.83	9799.57
Medical card	2299	35.0	10,888.63	104.72	5016.30
All other children	4276	65.0	18,971.28	161.31	10,549.82
Mean score differences					
			Diff	SED	CI95
Medical card – all other children			8082.65	192.32	(**7699.93, 8465.37**)

Table 4.7: Percentage of 13-year-old children who belong to each household class category, overall and by medical card status

	All children			Medical card			All other children		
	N	%	SE	N	%	SE	N	%	SE
Professional/ managers	3256	50.5	0.01	431	23.3	0.01	2825	61.4	0.01
Non-manual/ skilled	2374	36.8	0.01	954	51.6	0.01	1420	30.9	0.01
Semi-skilled/ unskilled	816	12.7	0.00	463	25.1	0.01	354	7.7	0.00
Total	6447	100.0	-	1848	100.0	-	4599	100.0	-

A much greater proportion of children who had access to a medical card at age 13 attended DEIS schools compared to those who did not have access to a medical card (28.9% compared to 11.5%) (Table 4.8). However, as at age nine, most thirteen-year-old children who have access to a medical card at age 13 did not attend a DEIS school (71.1%) and more medical card holders attended non-DEIS schools at age 13 than at age nine (66.5%; see Table 4.4).

Table 4.8: Percentage of 13-year-old children who attended schools according to DEIS category, overall and by medical card status

	All children			Medical card			All other children		
	N	%	SE	N	%	SE	N	%	SE
DEIS	1236	17.4	0.00	698	28.9	0.01	538	11.5	0.00
Non-DEIS	5853	82.6	0.00	1717	71.1	0.01	4135	88.5	0.00
Total	7089	100	-	2415	100	-	4673	100	-

4.1.2. Resilience and vulnerability

In this section, children who have access to a medical card are categorized further (i.e., as those who are classified as resilient, vulnerable and other medical card holders) using the definitions outlined on page 102. These groups of children are compared to each other as well as those children who do not have access to a medical card in terms of their performance on the Drumcondra tests, their families’ equivalised income and household social class.

Age nine

In wave one of the GUI child cohort sample, 246 children were classified as resilient (3.0% of all children), while 10.4% were classified as academically vulnerable (Table 4.9). The remaining children were either medical card holders who were classified as neither resilient nor vulnerable (14.5%) or children who did not hold a medical card (72.2%). At age nine, children classified as resilient are those who achieved a reading percent correct score of 78.46 or above and a mathematics score of 64.44 or above. Children classified as vulnerable children are those who had a reading score of 58.72 or below and a mathematics score of 45.29 or below. Other full-medical card holders are those children whose reading scores were between 58.72 and 78.46 and whose mathematics scores were between 45.29 and 64.44. More boys than girls (53.0% and 47.0%, respectively) were classified as resilient. On the other hand, much fewer boys than girls (43.6% and 56.4%, respectively) were classified as vulnerable.

The mean reading and mathematics scores of children classified as resilient (89.6 and 78.0, respectively; Table 4.9) are over one standard deviation above the mean of all children with access to a medical card (58.7 for reading and 45.3 for mathematics; Table 4.1) and about one standard deviation above the national means (67.6 and 53.7, respectively; Table 4.9). Thus, in this sample, children classified as resilient are not only performing at much higher levels than other children at risk of poverty, they are also performing at much greater levels than expected when compared to the national means.

On the other hand, the mean reading score for children classified as vulnerable (36.8) is about a standard deviation below the mean of all children with access to a medical card (58.7), while their mean mathematics score is just under a standard deviation below the corresponding mean for all children with access to a medical card (26.5 for vulnerable children and 45.3 for all children with a medical card). Also, as expected, children classified as vulnerable performed considerably less well than the national means, obtaining mean mathematics and reading scores that are over one standard deviation below the national means.

Children classified as resilient significantly outperformed children classified as vulnerable on reading and mathematics (Table 4.9). Children classified as resilient children also obtained significantly higher mean reading and mathematics scores than the means for other medical card holders (i.e. those who are not classified as resilient or vulnerable) (68.1 for reading and

52.0 for mathematics) and the means for children whose families do not have access to a medical card (71.0 for reading and 56.9 for mathematics). These findings demonstrate the large differences in performance between children classified as vulnerable and resilient, but also the large advantage in performance that children classified as resilient have compared to those who are not at risk of poverty.

Table 4.9: Mean reading and mathematics scores at age nine, overall and by resilience status

			Reading			Mathematics		
	N	%	Mean	SE	SD	Mean	SE	SD
All children	8326	100.0	67.6	0.24	21.80	53.7	0.23	21.52
Resilient	246	3.0	89.6	0.39	6.16	78.0	0.61	9.50
Vulnerable	863	10.4	36.8	0.45	13.23	26.5	0.41	12.01
Other medical card holders	1209	14.5	68.1	0.43	14.92	52.0	0.44	15.24
Non-medical card holders	6007	72.2	71.0	0.26	20.49	56.9	0.27	20.73
Mean score differences								
			Diff	SED	CI95	Diff	SED	CI95
Vulnerable-resilient			-52.8	0.60	(**-54.26,-51.34**)	-51.5	0.73	(**-53.30,-49.70**)
Other medical card holders-resilient			-21.5	0.58	(**-22.92,-20.08**)	-26.0	0.75	(**-27.84,-24.16**)
Non-medical card holders-resilient			-18.6	0.47	(**-19.75,-17.45**)	-21.1	0.67	(**-22.73,-19.47**)

The mean equivalised income of the families of children classified as resilient was 13,081.1 euros, which is considerably lower (just under half a standard deviation) than the national equivalised mean of 18,961.5 (Table 4.10). These children's families had a significantly higher mean income than vulnerable the families of children classified as vulnerable, but did not differ significantly from other children whose families have access to a medical card. Children classified as resilient had a significantly lower mean income than children whose families do not have access to a medical card. This indicates that while children classified as resilient may be considered at risk of poverty, they are relatively less at risk than children classified as vulnerable.

Table 4.10: Mean equivalised household income at age nine, overall and by resilience status

	N	%	Mean	SE	SD
All children	7787	100.0	18,961.5	140.57	12,404.3
Resilient	240	3.1	13,081.1	481.34	7452.23
Vulnerable	819	10.5	11,266.1	213.42	6107.63
Other medical card holders	1153	14.8	12,119.4	189.08	6419.61
Non-medical card holders	5576	71.6	21,759.0	175.04	13070.61
Mean score differences					
			Diff	SED	CI95
Vulnerable-resilient			-1815.00	526.53	**(-3102.37,-527.63**)
Other medical card holders-resilient			-961.70	517.15	(-2226.12,302.72)
Non-medical card holders-resilient			8677.90	512.18	(**7425.62,9930.18**)

There also appears to be a relationship between resilience status and household social class, as measured by parent's occupation (Table 4.11). Children classified as resilient, vulnerable or as other medical card holders are less likely than expected to have parents whose occupation falls into the professional/managers category, while children whose families do not have access to a medical card are more likely than expected to have parents whose occupations fall into this category, $\chi 2$ (6, N=7,336) = 714.105, $p < .001$ (see Table A4.3 in Appendix B). However, a greater proportion of children classified as resilient had parents whose occupations are in the professional/ managerial category when compared to children classified as vulnerable.

Table 4.11: Percentage of nine-year-old children who belong to each household class category, by resilience status

	Resilient			Vulnerable			Other medical card holders			Non-medical card holders		
	N	%	SE	N	%	SE	N	%	SE	N	%	SE
Professional/ managers	57	33.9	0.04	70	13.4	0.01	198	24.6	0.02	3134	53.7	0.00
Non-manual/ skilled	82	48.7	0.04	290	55.3	0.02	380	47.3	0.02	2218	38.0	0.01
Semi-skilled/ unskilled	29	17.4	0.03	164	31.2	0.02	226	28.1	0.02	488	8.3	0.00
Total	169	100	-	524	100	-	803	100	-	5840	100	-

Just over a quarter of children classified as resilient attended a DEIS school compared to about 45% of children classified as vulnerable, suggesting that the School Support Programme under DEIS is targeting the most at risk children in the country (Table 4.12). It also suggests that some kind of 'social context effect' may contribute to resilience in children, with some children from poorer families who attended schools with lower concentrations of children at risk of poverty displaying more positive outcomes.

Table 4.12: Percentage of nine-year-old children who attended schools according to DEIS category, by resilience status

	Resilient			Vulnerable			Other medical card holders			Non-medical card holders		
	N	%	SE	N	%	SE	N	%	SE	N	%	SE
DEIS urban band 1	31	12.5	0.02	232	26.9	0.02	143	11.8	0.01	287	4.8	0.00
DEIS urban band 2	16	6.5	0.02	101	11.8	0.01	89	7.4	0.01	290	4.8	0.00
DEIS rural	17	7.1	0.02	59	6.9	0.01	87	7.2	0.01	189	3.2	0.00
Non-DEIS	182	73.9	0.03	470	54.5	0.02	890	73.6	0.01	5241	87.2	0.00
Total	246	100	-	863	100	-	1209	100	-	6007	100	-

Age 13

Using the definitions outlined on page 102, 248 children were classified as resilient at 13 years old (3.5% of all children), while 952 children or 13.4% were classified as academically vulnerable (Table 4.13). As at age nine, more boys than girls (56.2% and 43.8%, respectively) were classified as resilient, although the relative proportion of boys increased by age 13. Also, much fewer boys than girls (37.3% and 62.7%, respectively) were classified as vulnerable at age 13 and the relative proportion of girls among this group was greater by age 13. As with medical card status, there have been some changes in the status of children classified as resilient, vulnerable or as other medical card holders between wave one and wave two of the GUI study. Of those who were classified as resilient at age nine, 26.9% were also classified as resilient at age 13, 2.4% were classified as vulnerable, 23.8% were non-medical card holders at age 13 (but had access to a medical card at age nine) and the remainder (46.8%) were medical card holders who were classified as neither resilient nor vulnerable. Of those who were classified as vulnerable at age nine, four (0.6%) were classified as resilient at 13 years old, while 6.9% of medical card holders who were classified as neither resilient nor vulnerable at age nine were classified as resilient and 25.7% were classified as vulnerable at age 13.

These findings indicate that the classification for some children has changed because of changes in their family circumstances (i.e., these children's families no longer have access to a medical card and therefore are no longer considered at risk of poverty or vice versa). However, for many, the change of classification appears to be an artifact of the arbitrary cut points used for the definitions of resilience and vulnerability in this study. For example, 62 children (0.7% of all children) were classified as resilient at age 13 but as 'other medical card holders' at age nine and these children had a mean reading score of 73.4 and a mean mathematics score of 59.1, which are both just below the cut point for children classified as resilient at age nine. Similarly, 102 children (1.4% of all children) were classified as resilient at age nine but 'other medical card holders' at age 13 and these children had a mean verbal reasoning score of 69.0 and a mean numerical ability score of 56.60, which are both just below the cut points for resilient children at age 13. At age 13, children classified as resilient are those who achieved a verbal reasoning score of 71.7 or above and a numerical ability score of 62.0 and above. Children classified as vulnerable are those who had a verbal reasoning score of 51.6 or below and a numerical ability score of 42.3 or below. Other full-medical card holders are those children who verbal reasoning scores were between 51.6 and 71.7 and whose numerical ability scores were between 42.3 and 62.0.

Table 4.13: Mean verbal reasoning and numerical ability scores at age 13, by resilience status

			Verbal reasoning			Numerical ability		
	N	%	Mean	SE	SD	Mean	SE	SD
All children	7099	100	60.2	0.27	22.99	50.4	0.28	23.20
Resilient	248	3.5	86.2	0.53	8.32	78.3	0.67	10.80
Vulnerable	952	13.4	30.5	0.40	12.32	24.6	0.35	10.68
Other medical card holders	1225	17.3	61.0	0.50	17.34	48.9	0.51	17.76
Non-medical card holders	4674	65.8	64.7	0.31	21.31	54.5	0.33	22.60
Mean score differences								
			Diff	SED	CI95	Diff	SED	CI95
Vulnerable – resilient			-55.7	0.66	(**-57.32, -54.08**)	-53.7	0.76	(**-55.55,-51.85**)
Other medical card holders –resilient			-25.2	0.73	(**-26.98, -23.42**)	-29.4	0.84	(**-31.46, -27.34**)
Non-medical card holders-resilient			-21.5	0.61	(**-23.00, -20.00**)	-23.8	0.75	(**-25.63, -21.97**)

Children classified as resilient children at age 13 have mean verbal reasoning and numerical ability scores (86.2 and 78.3, respectively) that are almost one standard deviation above the national means (60.2 and 50.4, respectively). Children classified as resilient children significantly outperformed children classified as vulnerable and other medical card holders (who are not considered resilient or vulnerable) on verbal reasoning and numerical ability (Table 4.13). Children classified as resilient also obtained significantly higher scores than children whose families do not have access to a medical card (64.7 for verbal reasoning and 54.5 for numerical ability). Thus, as at age nine, children classified as resilient at age 13 are performing at much higher levels than the national mean as well as performing at higher levels than other children with access to a medical card.

The mean equivalised household income of children classified as resilient is 10,882.18 euros, which is considerably lower (just under half a standard deviation) than the national equivalised mean of 16,145.14 (Table 4.14). The equivalised household income of children classified as resilient did not differ significantly to that of children classified as vulnerable or other medical card holders, but is significantly lower than that of children whose families do not have access to a medical card. This indicates that children classified as resilient are as at risk of poverty as children classified as vulnerable and other medical card holders at age 13, which is in contrast to the pattern observed at age nine.

Table 4.14: Mean equivalised household income at age 13, overall and by resilience status

	N	%	Mean	SE	SD
All children	6576	100.0	16,145.14	120.83	9799.57
Resilient	234	3.6	10,882.18	299.06	4573.84
Vulnerable	889	13.5	10,411.10	159.18	4747.05
Other medical card holders	1176	17.9	11,253.23	153.67	5270.32
Non-medical card holders	4276	65.0	18,971.28	161.33	10,549.82
Mean score differences					
			Diff	SED	CI95
Vulnerable-resilient			-471.08	338.78	(-1299.41, 357.25)
Other medical card holders-resilient			371.05	336.23	(-451.04, 1193.14)
Non-medical card holders-resilient			8089.10	339.80	(**7258.29, 8919.91**)

Children classified as resilient, vulnerable or as other medical card holders are less likely than expected to have parents whose occupations fall into the professional/managers category, while children whose families do not have access to a medical card are more likely than expected to have parents whose occupations fall into this category, χ^2 (6, N=6,446) = 886.00, $p<.001$ (see Table A4.4 in Appendix B and Table 4.15). In a similar pattern to that at age nine, a greater proportion of children classified as resilient have parents whose occupations are in the professional/managerial category when compared to children classified as vulnerable.

Table 4.15: Percentage of 13-year-old children who belong to each household class category, by resilience status

	Resilient			Vulnerable			Other medical card holders			Non-medical card holders		
	N	%	SE	N	%	SE	N	%	SE	N	%	SE
Professional/ managers	55	30.1	0.03	134	19.0	0.02	242	25.2	0.01	2825	61.4	0.01
Non-manual/ skilled	97	52.9	0.04	352	50.0	0.02	505	52.6	0.02	1420	30.9	0.01
Semi-skilled/ unskilled	31	16.9	0.03	218	31.0	0.02	213	22.2	0.02	354	7.7	0.00
Total	183	100	-	704	100	-	960	100		4599	100	-

Just under 40% of children classified as vulnerable attended a DEIS school, which is over twice the proportion of children classified as resilient who attended such a school (Table 4.16). As at age nine, the majority of children classified as resilient attended non-DEIS schools, further supporting the possibility that a ‘social context effect’ may contribute to resilience in children.

Table 4.16: Percentage of 13-year-old children who attend schools according to DEIS category, by resilience status

	Resilient children			Vulnerable children			Other medical card holders			Non-medical card holders		
	N	%	SE	N	%	SE	N	%	SE	N	%	SE
DEIS	40	16.0	0.02	368	38.9	0.02	291	23.8	0.01	538	11.5	0.00
Non-DEIS	208	84.0	0.02	579	61.1	0.02	930	76.2	0.01	4135	88.5	0.00
Total	248	100	-	947	100		1221	100	-	4673	100	-

4.2. Identifying unique predictors of resilience at nine and 13 years old

This study aims to develop and test a model of resilience among children at risk of poverty at two age points (nine and 13 years old). As a first step to developing the model of resilience, the factors associated with resilience were identified for both age groups. The associations between these factors will be examined further in Chapter 5. This section describes logistic regression analyses which were used to identify unique predictors of resilience at nine and 13 years old.

A review of the literature identified many factors associated with resilience which were then organised under the seven main categories (background characteristics; relationships with family, teachers and peers; educational expectations; attitudes towards school; parental involvement in their child’s education; engagement and meaningful participation; and the personal attributes of the child). Selected variables from the GUI database were organised under these seven categories and logistic regression analyses were conducted for each category using M*Plus* 6 to determine which independent variables predicted resilience/vulnerability in children at risk of poverty (see Chapter 3). As the purpose of the analyses was to identify which factors distinguish children classified as resilient from those classified as vulnerable, all other children with access to a medical card (and who were neither resilient nor vulnerable) were excluded from this analysis.[15] The same definition of poverty (i.e., access to a full medical card) was used for children at age 13 as at age nine. Similarly, the same definitions of resilience and vulnerability were applied at nine and 13 years old (see page 102). Medical card status changed for some children in the years between wave one and wave two of the GUI study, therefore some children who were classified as at risk of poverty at age nine were not classified in this way at age 13 (and vice versa) and therefore were not eligible to be classified as resilient or vulnerable.

Separate models were fitted for each of the seven categories outlined above (and for each age group within each category) so that unique predictors of resilience from each of the key areas of children's lives could be identified at both age levels. Each variable selected for a category was first tested as a predictor of resilience on its own. Next, all significant variables in a category were tested together so variables that remain significant predictors of resilience when other relevant factors are accounted for could be identified. In this way, the most persistent predictors of resilience could be identified. The pathways between these predictors will be described, separately for each age group, using structural equation modelling in Chapter 5.

Logistic regression modelling was conducted separately for each age group and in a sequence of steps as follows:

1) For each section, selected variables (see Chapter 3) were first tested individually using direct logistic regression analyses (with resilience/vulnerability as outcome) and significant variables (using the criterion of $p<0.05$) were identified. The odds ratio and significance levels for each variable tested separately are presented in Appendix B (according to the seven categories outlined earlier).
2) In each category, significant variables were tested for multi-collinearity in SPSS. The multicollinearity assumption was deemed to have *not* been violated if:

[15] Children were classified as resilient or vulnerable based on the definitions on page 102. All other children (i.e., non-medical card holders and medical card holders who were considered neither resilient nor vulnerable) were treated as missing data.

- Tolerance values were above 0.10;
- VIF values were below 10; and
- the correlation coefficients between independent variables were below 0.7 (Pallant, 2006).

In the sections that follow, reference to multicollinearity testing is made only if the multicollinearity assumption was violated.

3) Separate models were then tested using sequential logistic regression analyses for each of the seven categories outlined earlier. In each category, variables that were found to significantly predict resilience when tested on their own were tested together to identify which variables remained as significant predictors of resilience when the other variables were accounted for. Variables were entered one-by-one into the model and the sequence for adding variables was in accordance with Bronfenbrenner's bio-ecological model of child development, i.e., variables perceived to be closer to the child's immediate environment were added first. Variables that became non-significant were removed. Full-Information Maximum Likelihood (FIML) estimation was used to fit each model, i.e., missing values are not replaced or imputed instead all available information is used to estimate the model.
4) Final models were compared to the null model to determine statistical significance using the chi-square statistic. McFadden's ρ^2 was used to determine the effect size of each model. McFadden's ρ^2 is a transformation of the likelihood-ratio statistic intended to mimic an R^2 with a range of 0 to 1 (Tabachnick & Fidell, 2014). McFadden's ρ^2 tends to be much lower than R^2 for multiple regression with values in the .2 to .4 range considered to be highly satisfactory (Tabachnick & Fidell, 2014).

This modelling procedure was repeated for each category and within each category separate models were tested for each age level. As recommended by Aitkin, Francis and Hinde (2005), and as with previously-reported hierarchical linear models of Irish students (e.g., Cosgrove, Shiel, Sofroniou, Zastrutzki, & Shortt, 2005), no sampling weights are used in the logistic regression analyses. Aitkin, Francis and Hinde (2005) note that the use of weights in regression is inappropriate because 'they change the parameter estimates by giving higher weight to the samples from larger populations, though each observation in fact represents a single individual, not an aggregate of several individuals, and the weights increase the standard errors of the estimated coefficients' (p112).[16]

Next, the logistic regression analyses for each age group are described under the seven categories outlined in Chapter 3: background characteristics; relationships with family, teachers and peers; educational expectations; attitudes towards school; parental involvement in their child's education; engagement and meaningful participation; and the personal attributes of the child. The odds ratios for all significant variables (when other variables in the model are accounted for) are also described for each age level. As different combinations of variables and, in some cases, different measures were included in the final logit models at each age level, comparisons of the odds ratios for each variable between age levels are not recommended.

4.2.1. Background characteristics

Age nine

Of the five background variables selected at age nine, all were found to significantly predict resilience when tested separately (see Table A4.5 in Appendix B for the odds ratio and significance levels for each of the background variables). When these five variables were tested together, two variables (*highest level of education of parents* and *household social class)* were the only variables to remain significant predictors of resilience. Table 4.17 shows the final logit model examining the effect of these two background variables on the probability of a child being classified as resilient. Data were available for 539 children: 385 children were classified as vulnerable and 154 as resilient.

A test of the final model against a constant-only model was statistically significant, χ^2 (5, N=539) = 131.65, p<0.001, indicating that *household social class* and *highest level of education of parents* significantly distinguished between children classified as resilient and vulnerable children. The variance in resilience status accounted for by parental education (McFadden's ρ^2=0.32) is considered to be highly satisfactory (Tabachnick & Fidell, 2014).

---

[16] Personal communication with Professor Emer Smyth, Head of the Social Research Division and Research Professor at the Economic and Social Research Institute (ESRI), one of the organisations tasked with the implementation of the GUI study, confirmed that it is not necessary to use weights for modelling. She noted that the shrinkage of estimates for smaller schools (which are very prevalent in the GUI data) would make weighting more difficult (E. Smyth, personal communication, July 23, 2015).

Nine-year-old children whose highest level of parental education is a degree or higher were about 17 times more likely to be classified as resilient rather than vulnerable as those whose highest level of parental education was lower secondary, and over 20 times more likely to be classified as resilient rather than vulnerable as children whose parents left school after primary level, when household social class is held constant. Nine-year-old children whose highest level of parental education was upper secondary were about four times less likely to be classified as resilient when compared to children who have at least one parent who completed a degree or higher, while those whose parents' highest level of education was post-secondary but not to degree level were about three times less likely to classified as resilient when compared to this group.

Nine year old children whose parental occupation falls in the professional/managerial category were about three times more likely to be classified as resilient as those whose parental occupation falls into the non-manual/skilled manual category, and about four times more likely than those in the semi-skilled/unskilled manual category, when parental education level was accounted for.

Table 4.17: Final model of variables measuring background characteristics and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Highest level of education of parents	Primary – degree/post-grad	0.035	(0.002, 0.506)	0.014
	Lower secondary – degree/post grad.	0.060	(0.015, 0.245)	0.000
	Upper secondary - degree/post grad.	0.252	(0.091, 0.696)	0.008
	Non-degree - degree/post grad.	0.326	(0.107, 0.988)	0.048
Household social class	Skilled – professional/manager	0.345	(0.145, 0.823)	0.016
	Unskilled – professional/manager	0.268	(0.090, 0.797)	0.018

Age 13

Five background variables which were tested as part of the logistic regression analyses at wave one were also tested at wave two. Of these five variables, four variables were found to significantly predict resilience among children when tested separately (see Table A4.6 in Appendix B for the odds ratio and significance levels for each of the five background variables, tested separately). Three of the background variables remained significant predictors of resilience when all variables were tested together (*gender, highest level of parental education* and *proportion of income from welfare*). Table 4.18 shows the final logit model examining the effect of background variables on the probability of a student being classified as resilient. Data were available for 766 children: 571 children were classified as vulnerable and 195 as resilient.

A test of the final model against a constant-only model was statistically significant, χ^2 (9, N=766) = 59.61, p<0.001, indicating that *gender, highest level of education of parents* and *the proportion of income that comes from welfare* significantly distinguished between resilience and vulnerability at age 13. The variance in resilience status accounted for by these variables (McFadden's ρ^2=0.14) is small indicating that the model is not a good fit of the data (Tabachnick & Fidell, 2014).

Table 4.18: Final model of variables measuring background characteristics and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
gender	Female-male	0.462	(0.304, 0.703)	0.000
Highest level of education of parents	Primary – degree/post-grad	0.029	(0.004, 0.233)	0.001
	Lower secondary – degree/post grad.	0.094	(0.044, 0.204)	0.000
	Upper secondary - degree/post grad.	0.269	(0.154, 0.470)	0.000
	Non-degree - degree/post grad.	0.379	(0.216, 0.666)	0.001
Proportion of income from welfare	None – 100%	0.615	(0.082, 4.583)	0.635
	Less than 50% – 100%	2.180	(1.336, 3.558)	0.002
	50 to 99.9% – 100%	1.612	(0.847, 3.067)	0.146

Thirteen-year-old children who have at least one parent who completed a degree or higher were about two-and-a-half times more likely than those whose highest level of parental education was post-secondary (but not to degree level), to be classified as resilient when gender and the proportion of income from welfare are accounted for. Thirteen-year-old children who have at least one parent who completed a degree or higher were about four times more likely than those whose highest level of parental education is upper secondary, about 10 times more likely than those whose highest level of parental education is lower secondary and over 30 times more likely than those whose highest level of parental education is primary level to be classified as resilient, when all other factors in the model are held constant.

At age 13, boys were just over twice as likely to be classified as resilient as girls (when other factors are accounted for) and 13-year-old children whose families receive less than 50% of their income from welfare are about twice as likely to be classified as resilient than those who receive their full income from welfare, when gender and parental education level are held constant.

4.2.2. Relationships with family, teachers and peers

Age nine

The nature of children's relationships and their interactions with their family, friends and salient others can differ considerably and in the literature on resilience and in developmental psychology, these relationships are often considered separately. Therefore, in this analyses, children's relationships were analysed under three categories: relationships with their family, teachers and peers.

Eighteen variables were identified as measuring children's relationships with their family. Of these, seven were found to be significantly associated with resilience when tested separately (see Table A4.7 in Appendix B). When these seven significant variables were tested together, five variables remained significant predictors of resilience: *mother's responsiveness*, *conflict with primary caregiver, dependence on primary caregiver,* having a *positive relationship with siblings* and the child *talks to their dad about their problems* (Table 4.19).

A test of the final model with these variables against a constant-only model was statistically significant, χ^2 (5, N=575) = 118.10, p<0.001, indicating that *mother's responsiveness*, *conflict with primary caregiver, dependence on primary caregiver, positive relationship with siblings* and *talks to dad about their problems* significantly distinguished between children classified as resilient or vulnerable. Data were available for 575 children: 426 children were classified as vulnerable and 149 as resilient. The variance in resilience status accounted for by these variables is highly satisfactory (McFadden's ρ^2=0.29; Tabachnick & Fidell, 2014).

Table 4.19: Final model of variables measuring relationship with family and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Mother's responsiveness	–	0.732	(0.573, 0.936)	0.013
Conflict with primary caregiver	–	0.615	(0.467, 0.809)	0.001
Dependence on primary caregiver	–	0.725	(0.547, 0.962)	0.026
Positive relationship with siblings	Always – sometimes	0.417	(0.225, 0.772)	0.005
	Never – sometimes	0.463	(0.047, 4536)	0.508
Talks to dad re problems	Yes-no	1.928	(1.124, 3.308)	0.017

Nine-year-old children who reported greater levels of responsiveness from their mother, conflict with and dependence on their primary caregiver (all centred) were slightly less likely to be classified as resilient (rather than vulnerable) as those who reported lower levels of these characteristics, when all other variables were accounted for. Those who talked to their father about their problems are almost twice as likely to be classified resilient as those who did not. Children who reported that they sometimes get along with their siblings were about twice as likely to be classified as resilient as those who reported always or never getting along with their siblings (Table 4.19).

Two variables were identified as measuring relationships with teachers: the study child *talks to their teacher about their problems* and the study child reports that they *like their teacher*. Neither of the variables measuring the child's relationship with their teacher were found to significantly predict resilience when tested separately (see Table A4.8 in Appendix B).

Two variables were identified as measuring the study child's relationships with their peers and just one of these remained a significant predictor of resilience when tested separately (see Table A4.9 in Appendix B). Therefore, the study child *talks to their friends about their problem*s was the only variable included in the final model of variables measuring relationship with peers (Table 4.20). Nine year-old children who reported talking to their friends about their problems were almost twice as likely to be classified as resilient as those who did not.

A test of the final model with the study child *talks to their friends about their problem*s against a constant-only model was statistically significant, χ^2 (2, N=682) = 29.63, p<0.001, indicating that this variable significantly distinguished between children classified as resilient or vulnerable. Data were available for 682 children: 494 children were classified as vulnerable children and 188 as resilient. The variance in resilience status accounted for by this variables is very small (McFadden's ρ^2=0.07) indicating that the model is a poor fit of the data (Tabachnick & Fidell, 2014).

Table 4.20: Final model of variable measuring relationship with peers and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Talks to friends re problems	Yes-no	1.806	(1.060, 3.077)	0.030

Age 13

As at age nine, children's relationships were analysed under three categories: relationships with family, teachers, and peers. Fifteen variables, eight of which were also measured at wave one (see Table 3.18), were identified as measuring relationships with family. Twelve variables, which measured the child's relationship with their family at wave one, were not available at wave two (see Table 3.18). One of these variables (*positive relationship with siblings*) was found to significantly predict resilience at wave one. Of the 15 variables measuring relationship with family variables as predictors, nine were found to significantly predict resilience when tested separately (see Table A4.10 in Appendix B for the odds ratio and significance levels for each of the fifteen variables tested separately). When these variables were tested together, four remained significant predictors of resilience (Table 4.21).

A test of the final model against a constant-only model was statistically significant, χ^2 (4, N=380) = 232.61, p<0.001, indicating that *mother's level of demandingness, mother's level of responsiveness, the level of conflict with secondary caregiver* and *level of disclosure of the child to their primary caregiver* significantly distinguished between children classified as resilient or vulnerable. Data were available for 380 children: 269 children were classified as vulnerable children and 111 as resilient. The variance in resilience status accounted for by the variables measuring the child's relationship with their family (McFadden's ρ^2=0.52) is considered to be excellent (Tabachnick & Fidell, 2014).

Table 4.21: Final model of variables measuring relationship with family and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Mother's demandingness	–	1.538	(1.144, 2.068)	.004
Mother's responsiveness	–	1.590	(1.206, 2.098)	.001
Conflict with secondary caregiver	–	0.680	(0.516, 0.895)	.006
Disclosure primary caregiver	–	0.688	(0.529, 0.895)	.009

Thirteen-year-old children who reported greater levels of responsiveness (centred) from their mothers were about one-and-a-half times more likely to be classified as resilient as those who reported lower levels of responsiveness, when the other variables were accounted for. Similarly, 13-year-olds who reported greater levels of demandingness (centred) from their mothers were also about one-and-a-half times more likely to be classified as resilient. On the other hand, 13-year-old children who reported greater levels of conflict with their secondary caregiver and greater levels of disclosure (both variables centred) to their primary caregiver were almost one-and-a-half times less likely to be classified as resilient as those who reported lower levels, when the other variables in the model were accounted for (Table 4.21). Disclosure in this context refers to the extent to which children share information with their parents about what they are doing at school, their friends and what they do in their spare time.

Six variables, none of which were measured at wave one, were identified as measuring the child's relationship with their teacher at wave two. Two variables which measured this construct at wave one (the child *talks to their teacher about their problems* and the child *likes their teacher*) were not found to significantly predict resilience and neither of these variables were measured at wave two (see Table 3.19). Of the six variables measuring the child's relationship with their teacher identified at wave two, four were found to significantly predict resilience when tested separately (the odds ratio and significance levels for each of these six variables tested separately are shown in Table A4.11 in Appendix B). When these four variables were tested together, two variables remained significant in the final model: *the child is told by their teacher that their work is good* and *the child's teacher praises them for answering a question*. Table 4.22 presents the final model for the child's relationship with their teacher. Data were available for 771 children: 574 children were classified as vulnerable and 197 as resilient.

A test of the final model against a constant-only model was statistically significant, χ^2 (4, N=771) = 34.24, p<0.001, indicating that a child being *told more frequently by their teacher that their work is good* and *being praised for answering a question* significantly distinguished between children classified as resilient and vulnerable. The variance in resilience status accounted for by the child's relationship with their teacher (McFadden's ρ^2=0.08) is very small and therefore the model fit is considered to be poor (Tabachnick & Fidell, 2014).

Table 4.22: Final model of variables measuring child's relationship with their teacher and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Child is told by a teacher that their work is good	Very often or often – a few times or never	3.558	(2.126, 5.954)	0.000
The child's teacher praises them for answering a question	Very often or often – a few times or never	1.990	(1.328, 2.983)	0.001

When these two variables are considered together, 13-year-old children who were often or very often told by their teacher that their work is good are over three-and-a-half times more likely to be classified as resilient as those who were only told a few times or never. Also, children who are often praised by their teacher for answering a question are about twice as likely to be classified as resilient as those who were only praised a few times or never.

Three variables, one of which was also measured at wave one (see Table 3.20), were identified as measuring relationships with peers at wave two. One variable (*the child talks to friends about problems*) which measured the child's relationship with peers at wave one (and was found to significantly distinguish between children classified as resilient or vulnerable) was not available at wave two. Two variables measuring adolescents' attachment to peers (*feelings of alienation* and *trust* scales) were measured at wave two but not at wave one. Of the three variables measuring the child's relationship with peers, none were found to significantly predict resilience when tested separately (see Table A4.12 in Appendix B for the odds ratio and significance levels for each of these three variables).

4.2.3. Educational expectations

Age nine

Educational expectations were examined from three perspectives: the child's own expectations, their parents' expectations for them and their teachers' expectations. At age nine, just one variable measured the child's educational expectations (*how well the study child thinks they are doing at school*), but was not found to be significantly associated with resilience (see Table A4.13 in Appendix B).

One variable was identified from the GUI dataset that measured the parents' educational expectations of their child and it was significantly associated with resilience (Table 4.23). A test of the final model with primary caregiver's ratings of *how far the primary caregiver expects the study child to go in education* against a constant-only model was statistically significant, χ^2 (3, N=755) = 36.16, p<0.001, indicating that the primary caregiver's educational expectations for the study child significantly distinguished between children classified as resilient or vulnerable. Data were available for 755 children: 561 children classified as vulnerable children and 194 as resilient. The variance in resilience status accounted for by variables measuring the primary caregiver's educational expectations for the study child (McFadden's ρ^2=0.09) is considered to be small indicating that the model is a poor fit of the data (Tabachnick & Fidell, 2014).

Table 4.23: Final model of variable measuring the parents' educational expectations for their child and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
How far the primary caregiver expects their child to go in education	LC. or earlier – Degree/Post Grad	0.035	(0.008, 0.160)	0.000
	Diploma/Cert. – Degree/Post Grad	0.136	(0.045, 0.411)	0.000

At age nine, children whose primary caregiver expects them to finish their education at the Leaving Certificate or before are over 28 times less likely to be classified as resilient than those who are expected to complete a degree or post-graduate degree, while those who expect them to gain a qualification higher than the Leaving Certificate (but not to degree level) were about seven times less likely to be classified as resilient.

Seven variables measured teachers' perceptions of the study child's ability in different areas (i.e., rating of comprehension, reading, problem solving, writing, mathematics, oral communications, and imagination/creativity). Principal components analysis was conducted with these variables for the purposes of data reduction (see Table A3.11 in Appendix A). This analysis revealed one component, *teachers' ratings of the study child's school performance,* with eigenvalues exceeding 1.

The *teachers' ratings of the study child's school performance* was significantly associated with resilience (see Table 4.24). A test of the final model against a constant-only model was statistically significant, χ^2 (2, *N*=674) = 230.01, p<0.001, indicating that the teacher's educational expectations for the study child significantly distinguished between children classified as resilient and vulnerable. The variance in resilience status accounted for by the teachers' rating of the study child's school performance is large (McFadden's ρ^2=0.56) indicating that the model is considered to be an excellent fit (Tabachnick & Fidell, 2014). Nine-year-old children whose teachers gave them higher ratings of school performance were found to be over 40 times as likely to be classified as resilient as those with lower teacher ratings.

Table 4.24: Final model of variable measuring teacher's educational expectations for the study child and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Teachers' ratings of study child's school performance	–	40.5	(11.09, 147.91)	0.000

Age 13

No data on teachers' educational expectations were collected in wave two of the GUI study therefore only the child's own expectations and their parents' educational expectations for them were examined at age 13. One variable (*how far the child expects to go in education*), which was not measured at wave one, was identified as measuring the child's own educational expectations at wave two. This variable was significantly associated with resilience at age 13 (Table 4.25).

A test of the final model against a constant-only model was statistically significant, χ^2 (4, N=762) = 85.61, p<0.001, indicating that *how far a child expects to go in education* significantly distinguished between children classified as resilient or vulnerable. Data were available for 762 children: 568 children classified as vulnerable and 194 classified as resilient. The variance in resilience status accounted for by the variable measuring the child's own educational expectations (McFadden's ρ^2=0.20) is considered to be highly satisfactory (Tabachnick & Fidell, 2014).

Table 4.25: Final model of variable measuring the child's educational expectations for themselves and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
How far the child expects to go in education	Junior Cert. – Degree/Post Grad	0.033	(0.012, 0.123)	0.000
	Leaving Cert. – Degree/Post Grad	0.053	(0.027, 0.107)	0.000
	Diploma/Cert. – Degree/Post Grad	0.285	(0.168, 0.483)	0.000

Thirteen-year-old children who expect to complete a degree or postgraduate qualification are about three-and-a-half times more likely to be classified as resilient as those who expect to complete a diploma or certificate, over 18 times more likely than those who expect to leave school on completion of the Leaving Certificate and about 30 times more likely than those who expect to leave school after the Junior Certificate.

One variable measured the child's parents' expectations for how far they would go in education and was significantly associated with resilience (Table 4.26). A test of the final model against a constant-only model was statistically significant, χ^2 (3, N=755) = 63.54, p<0.001, indicating that *how far the child's parents expects them to go in education* significantly distinguished between children classified as resilient and vulnerable. Data were available for 755 children: 561 children classified as vulnerable and 194 as resilient. The variance in resilience status accounted for by the variables measuring parental educational expectations (McFadden's ρ^2=0.14) is considered to be small (Tabachnick & Fidell, 2014).

Thirteen-year-old children whose parent's expect them to finish their education at the Leaving Certificate or earlier were over 25 times less likely to be classified as resilient than those who are expected to complete a degree or post-graduate degree. Those whose parents expect them to gain a degree or post-graduate qualification are almost seven times more likely to be classified as resilient than those expected to gain a qualification higher than the Leaving Certificate but not to degree level.

Table 4.26: Final model of variable measuring the parents' educational expectations for their child and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
How far the child's parents expects them to go in education	LC or earlier – Degree/Post Grad	0.039	(0.012, 0.129)	0.000
	Diploma/Cert. – Degree/Post Grad	0.146	(0.076, 0.278)	0.000

4.2.4. Attitudes towards school

Age nine

Two variables were identified from the GUI dataset that measure the study child's attitudes towards school: how much the study child *likes school* and *looks forward to school*. Both variables were found to be significant predictors of resilience, when tested separately (see Table A4.14 in Appendix B for the odds ratio and significance level for each variable) but just one (how much the study child *likes school*) remained significant when tested together (Table 4.27).

A test of the final model against a constant-only model was statistically significant, χ^2 (3, *N*=709) = 21.54, p<0.001, indicating that how much the child *likes school* significantly distinguished between children classified as resilient or vulnerable. Data were available for 709 children: 519 children classified as vulnerable and 190 as resilient. The variance in resilience status accounted for by how much the child *likes school* is very small, with McFadden's ρ^2=0.05, indicating that the model does not fit the data well.

Table 4.27: Final model of variable measuring the child's attitude towards school and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Study child likes school	Always – never	2.607	(0.903, 7.525)	0.076
	Sometimes – never	4.246	(1.632, 11.041)	0.003

Nine-year-old children who reported liking school always were over two-and-a-half times as likely as those who never liked school to be classified as resilient, while those who indicated that they sometimes like school are over four times as likely to be classified as resilient as those who never like school.

Age 13

Just one variable (how much the study child *likes school*), which was also measured at wave one, was identified as measuring the child's attitude towards school at wave two. Another variable (how much the study child *looks forward to school*), was measured at wave one but was not measured at wave two. A test of the final model with how much the study child *likes school* against a constant-only model was statistically significant, χ^2 (4, N=773) = 13.76, p<0.001 (Table 4.28). Data were available for 773 children: 576 children classified as vulnerable and 197 as resilient. The variance in resilience status accounted for by how much the study child likes school (McFadden's ρ^2=0.03) is very small indicating that the model is a poor fit of the data (Tabachnick & Fidell, 2014).

Thirteen-year-old children who like school very much or quite a bit are about three times as likely to be classified as resilient as those who do not like school (compared to about four times at age nine), while those who like it a bit are about twice as likely to be classified as resilient as those who do not like it.

Table 4.28: Final model of variable measuring the child's attitude towards school and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Study child likes school	Like very much – Don't like	2.705	(1.316, 5.558)	0.007
	Like quite a bit – Don't like	3.080	(1.542, 6.151)	0.001
	Like a bit – Don't like	2.103	(1.038, 4.263)	0.039

4.2.5. Parental involvement in their child's education

Age nine

Parental involvement with their child's education has also been found to be associated with resilience, therefore three variables that measure this construct were also included. Two of the three variables were found to be significantly associated with resilience when tested separately (see Table A4.15 in Appendix B for the odds ratio and significance levels for each of these variables). When tested together, both variables remained significant predictors of resilience (Table 4.29).

The final model was found to be statistically significant when compared against a constant-only model, χ^2 (5, N=622) = 77.13, p<0.001. This indicates that *parents' attendance at parent/teacher meetings* and *how often parents provide help with homework* significantly distinguished between children classified as resilient or vulnerable. Data were available for 622 children: 455 children were classified as vulnerable children and 167 as resilient. Both variables were found to significantly predict resilience. The variance in resilience status accounted for by the variables measuring parental involvement in their child's education is small, with McFadden's ρ^2=0.18, but can be considered to be satisfactory (Tabachnick & Fidell, 2014).

Table 4.29: Final model of variables measuring parental involvement in their child's education and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Parents /guardians have attended a formal meeting with their child's teacher (teacher report)	Yes-No	15.213	(2.980, 77.671)	0.001
How often parents help their child with their homework?	Always – rarely/never	0.250	(0.110, 0.566)	0.001
	Regularly – rarely/never	0.250	(0.096, 0.651)	0.005
	Now and again – rarely/never	0.593	(0.254, 1.384)	0.227

When attendance at parent-teacher meetings was accounted for, nine-year-old children whose parents reported always or regularly helping them with homework were about four times less likely to be classified as resilient compared to those whose parents never helped them. Children whose teachers reported that their parents/guardians attend parent/teacher meetings are over 15 times as likely to be classified as resilient as those whose parents did not attend these meetings, when frequency of helping with homework was held constant. The frequency with parents help with homework could be related to other factors, such as the educational attainment of the parents, with those who have lower levels of attainment maybe unable to help their children with their homework.

Age 13

Five variables, two of which were also measured at wave one (see Table 3.25), were identified as measuring parental involvement in their child's education at wave two. One variable that was measured at wave one (*teachers' reports of parents' attendance at parent-teacher meetings*) and was found to significantly predict resilience, was not measured at wave two. Three variables measured at wave two (*parental attendance at school concert play or other event; parents have met with principal about child's behaviour/school performance; parents have spoken with principal on phone about child's behaviour/school performance*) were not measured at wave one.

Of the five variables measuring parental involvement with their child's education, four were found to significantly predict resilience when tested separately (see Table A4.16 in Appendix B for the odds ratio and significance levels for each of these five variables). Three variables remained significant in the final model, when tested together: *parental attendance at school concert, play or other event; parents have met with principal about child's behaviour or school performance* and *how often the study child's parents help with their homework* (Table 4.30).

Table 4.30: Final model of variables measuring parental involvement in their child's education and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Parents have met the principal about child's behaviour or school performance	Yes-No	0.518	(0.328, 0.818)	0.005
Parents have attended a school concert, play or other event	Yes-No	2.036	(1.375, 3.016)	0.000
How often the study child's parents help with their homework	Always – rarely/never	0.131	(0.047, 0.366)	0.000
	Regularly – rarely/never	0.484	(0.267, 0.878)	0.017
	Now and again – rarely/never	0.630	(0.406, 0.977)	0.039

A test of the final model against a constant-only model was statistically significant, χ^2 (6, *N*=767) = 32.91, p<0.001, indicating that the three variables measuring parental involvement in their child's education significantly distinguished between children classified as resilient or vulnerable. Data were available for 767 children: 572 children were classified as vulnerable children and 195 as resilient. The variance in resilience status accounted for by the variables measuring parental involvement in their child's education (McFadden's ρ^2=0.07) is very small and the model can be considered to be a poor fit of the data (Tabachnick & Fidell, 2014).

When other variables in the model are accounted for, 13-year-old children whose parents always help them with their homework were about seven times less likely to be categorized as resilient as those whose parents rarely or never did so, while those whose parents regularly helped were about half as likely to be classified as resilient. Those whose parents helped now and again were about one-and-a-half times less likely to be classified as resilient as those whose parents rarely or never helped. Thirteen-year-old children whose parents did not have a meeting with the school principal about their child's behaviour or school performance were about twice as likely to be classified as resilient when compared to those whose parents did meet with the principal, when other factors in the model were accounted for. It is possible that parents would usually attend such meetings to discuss problematic behaviour and this may explain the negative association with resilience. In contrast, parental attendance at a school concert, play or other event was significantly associated with resilience at age 13, such that children whose parents attended such an event were twice as likely to be classified as resilient as those whose parents did not attend such events, when the other variables in the model were held constant.

4.2.6. Engagement and meaningful participation

Age nine

Children's engagement and meaningful participation was considered under three categories to reflect the different environments in which children generally spend their time: the child's lifestyle (habits and routine in their daily lives), the child's engagement with family and the child's engagement with school.

4.2.6.1. Engagement and meaningful participation - Children's lifestyle

Ten variables were identified that measure the child's daily leisure and extra-curricular activities. Of these, eight were significant predictors of resilience when tested separately (see Table A4.17 in Appendix B for the odds ratio and significance levels for each of these variables). When these eight variables were tested together, five remained significant predictors of resilience (Table 4.31). The final model was found to be statistically significant when compared against a constant-only model, χ^2 (10, N=710) = 62.91, p<0.001. This indicates that child lifestyle factors significantly distinguished between children classified as resilient or vulnerable. Data were available for 710 children: 520 children were classified as vulnerable children and 190 as resilient. The variance in resilience status accounted for by the variables measuring the study child's lifestyle variables is small, with McFadden's ρ^2=0.15, and can be considered as less than satisfactory (Tabachnick & Fidell, 2014).

Table 4.31: Final model of variables measuring the study child's lifestyle and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Time spent reading for pleasure on normal week day	Less than 1 hour – no time	10.574	(3.059, 36.552)	0.000
	More than 1 hour – no time	24.543	(6.431, 93.666)	0.000
Participates in sports/ fitness club	Yes-No	2.750	(1.532, 4.936)	0.001
Participates in cultural activities	Yes-No	2.047	(1.159, 3.616)	0.014
Participates in homework club	Yes-No	0.183	(0.067, 0.505)	0.001
Time spent doing things with friends outside of school	Never – Every day	2.517	(0.867, 7.307)	0.090
	Rarely– Every day	3.565	(1.476, 8.610)	0.005
	Some days– Every day	1.597	(0.794, 3.213)	0.189
	Most days – Every day	1.517	(0.681, 3.377)	0.308

When the other factors in the model are accounted for, children who spend less than an hour reading for pleasure on a normal week day are over 10 times as likely to be classified as resilient as those who never read for pleasure, at age nine. On the other hand, those who spend more than an hour a day reading for pleasure are almost 25 times as likely to be classified as resilient. Nine-year-old children who do not take part in homework clubs at age nine are about five times more likely to be classified as resilient as those who do participate in these clubs, suggesting that these children may participate in these clubs because they are performing less well in school.

Nine-year-old children who participate in a sports or fitness club are almost three times as likely to be classified as resilient as those who do not, while nine-year-old children who participate in cultural activities are about twice as likely to be classified as resilient, when the other variables in the model are accounted for. Time spent with friends outside of school is also related to resilience. Nine-year-old children who rarely do things with their friends are about three-and-a-half times as likely to be classified as resilient compared to those do things with their friends every day, when other lifestyle variables are accounted for.

4.2.6.2. Engagement and meaningful participation - Engagement with family

Eighteen variables were identified that were related to the study child's engagement with their family. Of these, three were combined into a scale (*time spent with extended family*), meaning that 16 variables were tested as predictors of resilience/vulnerability (see Table A4.18 in Appendix B for the odds ratio and significance levels for each of these variables). Of these variables, just two were significant predictors of resilience when tested separately. When both these variables were tested in the final model together, both remained significantly associated with resilience (Table 4.32).

A test of the final model (with the child's report of *how often they have a say in family decisions* and *frequency with which the primary caregiver talks about things with the study child*) against a constant-only model was statistically significant, χ^2 (5, N=675) = 40.73, p<0.001, indicating that the child's engagement with family significantly distinguished between children classified as resilient or vulnerable. Data were available for 675 children: 490 children were classified as vulnerable and 185 as resilient. The variance in resilience status accounted for by the child's engagement with family is small (McFadden's ρ^2=0.10) indicating that the model does not fit the data well (Tabachnick & Fidell, 2014).

Table 4.32: Final model of variables measuring engagement with family and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	p
How often the study child feels they have a say in family decisions	Always – never	0.233	(0.081, 0.670)	0.007
	Sometimes – never	0.475	(0.195, 1.161)	0.102
Time spent talking about things with the study child (parent report)	Every day – < 2 days	3.346	(1.154, 9.700)	0.026
	3-6 days – < 2 days	4.530	(1.463, 14.026)	0.009

At age nine, children who report always having a say in what the family does are about four times less likely to be classified as resilient when compared to those who report never having a say, when time spent talking about things with the study child is accounted for. Nine-year-old children who report talking about things with their primary caregiver every day are over three times as likely to be classified as resilient compared to those who talk to their primary caregiver less than two days a week, while those who talk about things with their primary caregiver between three and six days a week are about four-and-a-half times more likely to classified as resilient, when the frequency of having a say in family decisions is held constant.

4.2.6.3. Engagement and meaningful participation - Engagement with school

The final set of variables that fall under the child engagement and meaningful participation category are related to the child's engagement with school. Three variables measuring the study child's engagement in school were selected for analyses and, of these, two were significant predictors of resilience when tested separately (see Table A4.19 in Appendix B for the odds ratio and significance levels for each of these variables). When these variables were tested together, only *how often the study child arrives at school with homework not complete* remained a significant predictor of resilience, therefore this is the only variable in the final model for engagement with school (Table 4.33).

A test of the final model against a constant-only model was statistically significant, χ^2 (3, N=683) = 56.18, p<0.001, indicating that the frequency of having incomplete homework distinguished between children classified as resilient or vulnerable. Data were available for 683 children: 497 children were classified as vulnerable and 186 as resilient. The variance in resilience status accounted for by the child's engagement with school is small (McFadden's ρ^2=0.14) indicating that the model is not a good fit of the data (Tabachnick & Fidell, 2014).

Table 4.33: Final model of variables measuring engagement with school and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	p
How often the child arrives at school with incomplete homework (teacher report)	Never – occasionally	4.823	(2.696, 8.628)	0.000
	Regularly – occasionally	0.282	(0.087, 0.915)	0.035

Nine-year-old children whose teachers reported that they never arrive at school with incomplete homework were found to be almost five times as likely to be classified as resilient as those who occasionally do this, while those who regularly arrive at school with incomplete homework are about three-and-a-half times less likely to be classified as resilient when compared to those who occasionally do so.

Age 13

As at age nine, child engagement and meaningful participation was considered under three categories: the child's lifestyle (habits and routine), the child's engagement with family and the child's engagement in school.

4.2.6.4. Engagement and meaningful participation - Children's lifestyle

Ten variables, seven of which were also measured at wave one were identified that relate to the study child's lifestyle wave two. Three variables that were measured at wave two (the study child *participates in a regular leisure activity, plays sport as part of a team* and *plays sport without a coach*) were not measured at wave one, although the latter two are similar to a variable measured at wave one (study child *participates in sports*).

Six of these ten variables were found to significantly predict resilience when tested separately (see Table A4.20 in Appendix B). When these six variables were tested together, four variables remained significant predictors of resilience (Table 4.34). A test of the final model against a constant-only model was statistically significant, χ^2 (6, N=762) = 98.20, p<0.001, indicating that *time spent reading for pleasure on a normal week day, time spent playing video games on a normal week day, participation in sports without a coach* and *participation in a homework club* significantly distinguished between children classified as resilient or vulnerable. Data were available for 762 children: 566 children were classified as vulnerable and 196 as resilient. The variance in resilience status accounted for by the variables measuring child's lifestyle (McFadden's ρ^2=0.27) is highly satisfactory (Tabachnick & Fidell, 2014).

Table 4.34: Final model of variables measuring the study child's lifestyle and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	p
Time spent reading for pleasure on normal week day	Less than 1 hour – no time	2.995	(1.679, 5.341)	0.000
	More than 1 hour – no time	2.643	(1.536, 4.548)	0.000
Time spent playing video games on normal week day	Less than 1 hour – no time	2.102	(1.306, 3.382)	0.002
	More than 1 hour – no time	0.990	(0.646, 1.517)	0.963
Study child plays sport without a coach	Yes-No	1.675	(1.079, 2.601)	0.022
Study child participates in a homework club	Yes-No	0.437	(0.234, 0.819)	0.010

When all variables in the model are accounted for, 13-year-old children who read for less than an hour a day were about three times more likely to be classified as resilient, while those who read for more than an hour a day are about two-and-a-half times more likely to be classified as resilient when compared to those who do not read. Thirteen-year-old children who are part of a homework club are about half as likely to be classified as resilient as those who are not members, while those who participate in sports without a coach are almost twice as likely to be categorised as resilient as those who don't. As well as time spent reading for pleasure, participation in sports and participation in a homework club, time spent playing video games was also significantly associated with resilience at age 13. Thirteen-year-old children who spend less than an hour a day on a normal weekday playing video games are about twice as likely to be categorised as resilient as those who do not play video games on weekdays at all.

4.2.6.5. Engagement and meaningful participation - Engagement with family

Six variables, all of which were also measured at wave one (including a composite measure of time spent with extended family; see Table 3.27), were identified that relate to the study child's engagement with their family at wave two. Ten variables measuring engagement with family that were measured at wave one, one of which significantly predicted resilience (*how often the study child has a say in what the family does*) were not measured at wave two. Of the six variables measuring engagement with family variables at wave two, none were found to be significant predictors of resilience when tested separately (see Table A4.21 in Appendix B).

4.2.6.6. Engagement and meaningful participation - Engagement with school

Two variables (one of which was a composite of seven variables measuring disengagement; see Table 3.28), were identified that relate to the study child's engagement with school at wave two. One of the two variables, *disengagement from school*, was measured at wave two only. Of these variables only *disengagement from school* significantly predicted resilience at age 13 (Table A4.22). A test of the final model against a constant-only model was statistically significant, χ^2 (2, N=772) = 15.95, p<0.001, indicating that *disengagement from school* significantly distinguished between children classified as resilient or vulnerable (Table 4.35). Data were available for 772 children: 575 children were classified as vulnerable children and 197 as resilient. The variance in resilience status accounted for by a child's *disengagement from school* (McFadden's ρ^2=0.04) is very small (Tabachnick & Fidell, 2014), indicating that the model is a poor fit of the data.

Table 4.35: Final model of variable measuring engagement with school and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Disengagement from school	–	0.733	(0.625, 0.859)	0.001

At age 13, *disengagement from school* significantly distinguished between resilience and vulnerability such that children who reported greater levels of disengagement from school were almost one-and-a-half times less likely to be classified as resilient as those who were more engaged in school.

4.2.7. Personal attributes of the child

Age nine

In the resilience literature it has been hypothesized that a child's self-concept is related to their psychological adjustment and social skills. Therefore, in the current study variables measuring the personal attributes of the child are classified under two categories: those that measure the child's self-concept and those that measure the child's psychological adjustment and temperament. Six variables were identified that measure the child's self-concept, each of which relate to the Piers Harris Children's Self-Concept subscales: *behavioural adjustment; intellectual and school status; physical appearance and attributes; freedom from anxiety; popularity;* and *happiness and satisfaction*.

All of the six Piers Harris Children's Self-Concept subscales, with the exception of *physical appearance and attributes,* were found to be significantly associated with resilience when tested separately (see Table A4.23 in Appendix B). When the five significant subscales were tested together, just two (*behvaioural adjustment* and *freedom from anxiety*) were still significantly related to resilience (Table 4.36). A test of the final model against a constant only model was statistically significant, χ^2 (3, N=670) = 60.12, p<0.001, indicating that the child's *behavioural adjustment* and *freedom from anxiety* distinguished between children classified as resilient or vulnerable. Data were available for 670 children: 490 children were classified as vulnerable and 180 as resilient. The variance in resilience status accounted for by the variables measuring the child's self-concept, as measured by McFadden's ρ^2 (0.15), is small and can be considered to be less than satisfactory (Tabachnick & Fidell, 2014).

Table 4.36: Final model of variables measuring the child's self-concept and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	p
Behavioural adjustment	–	1.653	(1.244, 2.196)	0.001
Freedom from anxiety	–	1.669	(1.216, 2.291)	0.002

At age nine, those with a more positive behavioural adjustment self-concept (centred) were over one-and-a-half times more likely to be classified as resilient as those with a lower behavioural adjustment self-concept, when freedom from anxiety was accounted for. Similarly, nine-year-old children who had greater freedom of anxiety (centred) were also about one-and-a-half times more likely to be classified as resilient as those with higher levels of anxiety, when behavioural adjustment was held constant.

The study child's psychological adjustment was measured using scores from the five subscales of the Strength and Difficulties Questionnaire (SDQ) (i.e*., emotional symptoms, conduct problems, hyperactivity/inactivity, peer relationship problems* and *pro-social behvaiour*) and their temperament was measured using the four EAS Temperament Scale subscales (*emotionality, activity, sociability* and *shyness*). It was deemed important to include, where possible, information from multiple perspectives, therefore SDQ scores were included from both the primary caregiver and the study child's teacher (i.e., ten SDQ subscales were included). EAS scores were only available from the primary caregiver.

All of the SDQ subscales, with the exception of the primary caregivers' report of *pro-social behavior*, were significantly associated with resilience. Of the EAS subscales, just the *emotionality* of the study child significantly predicted resilience (see Table A4.24 in Appendix B).

The 10 variables measuring psychological adjustment and temperament that were significant predictors of resilience were tested together. In accordance with Bronfenbrenner's bio-ecological model of child development, variables relating to primary caregiver reports were entered first, followed by variables relating to teacher reports. Table 4.37 shows the final model for the child's psychological adjustment and temperament variables with two variables remaining as significant predictors of resilience.

A test of the final model with the primary caregivers' reports of the study child's *emotional symptoms* and the teachers report on the child's *hyperactivity* was statistically significant, χ^2 (3, *N*=695) = 80.77, p<0.001, indicating that the child's psychological adjustment distinguished between children classified as resilient or vulnerable. Data were available for 695 children: 508 children classified as vulnerable and 187 as resilient. The variance in resilience status accounted for by the child's psychological adjustment, as measured by McFadden's ρ^2 (0.20), is, according to Tabachnick and Fidell (2014), highly satisfactory.

Table 4.37: Final model of the variables measuring the child's psychological adjustment and resilience, age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Hyperactivity (SDQ teacher)	–	0.301	(0.212, 0.429)	0.000
Emotional symptoms (SDQ parent)	–	0.620	(0.474, 0.811)	0.000

Nine-year-old children who reported greater levels of hyperactivity (centred) were over three times less likely to be classified as resilient as those who had lower levels of hyperactivity, when emotional symptoms were accounted for. Similarly, children aged nine who had greater levels of emotional symptoms (centred) were just over one-and-a-half times less likely to be classified as resilient as those had fewer emotional symptoms, when hyperactivity was held constant.

Age 13

As at age nine, variables measuring the personal attributes of the child are also classified under two categories at age 13: those that measure the child's self-concept and those that measure the child's psychological adjustment. Six variables, which relate to the Piers Harris Self-Concept subscales (*behavioural adjustment, intellectual and school status, physical appearance and attributes, freedom from anxiety, popularity,* and *happiness and satisfaction*) measured the study child's self-concept at ages nine and 13 (see Table 3.29).

Of the six self-concept variables, two were found to significantly predict resilience when tested separately (see Table A4.25 in Appendix B). When these two variables were tested together, just one (*intellectual self-concept and school status*) remained a significant predictor of resilience (Table 4.38). A test of the final model against a constant-only model was statistically significant, χ^2 (2, N=765) = 34.28, p<0.001, indicating that a child's intellectual self-concept significantly distinguished between children classified as resilient or vulnerable. Data were available for 765 children: 568 children were classified as vulnerable children and 197 as resilient. The variance in resilience status accounted for by the child's intellectual self-concept (McFadden's ρ^2=0.08) is small (Tabachnick & Fidell, 2014), indicating that the model is a poor fit of the data. Thirteen year old children who had a more positive intellectual self-concept (centred) were about twice as likely to be classified as resilient as those with lower intellectual self-concept.

Table 4.38: Final model of the variable measuring the child's self-concept and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Intellectual and school status	–	2.023	(1.616, 2.533)	0.000

Eleven variables were identified that relate to the study child's psychological adjustment at wave two. Five of these related to the subscales of the Strengths and Difficulties

Questionnaire (parents' reports; Goodman, 1997) and were also measured at wave one (see Table 3.30). Nine variables that were measured at wave one (including five that related to teacher's responses to the Strengths and Difficulties Questionnaire), six of which were found to significantly predict resilience, were not measured at wave two. Six variables, five of which related to the Ten Item Personality Inventory (TIPI) subscales, were measured at wave two but were not measured at wave one.

Of the eleven psychological adjustment variables selected, seven were significant predictors of resilience when tested separately (see Table A4.26 in Appendix B). When these seven variables were tested together two remained significant predictors of resilience: *emotional symptoms* and *hyperactivity* (Table 4.39). A test of the final model against a constant-only model was statistically significant, χ^2 (3, N=775) = 58.50, p<0.001, indicating that *emotional symptoms* and *hyperactivity* significantly distinguished between children classified as resilient or vulnerable. Data were available for 775 children: 577 children were classified as vulnerable children and 198 as resilient. The variance in resilience status accounted for by a child's *emotional symptoms* and *hyperactivity* (McFadden's ρ^2=0.13) is small (Tabachnick & Fidell, 2014), indicating that the model is a less than satisfactory fit of the data.

Table 4.39: Final model of the variables measuring the child's psychological adjustment and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Emotional symptoms (SDQ parent)	–	0.713	(0.592, 0.860)	0.002
Hyperactivity (SDQ parent)	–	0.463	(0.376, 0.571)	0.000

Thirteen-year-old children who displayed lower levels of hyperactivity (centred) were over twice as likely to be classified as resilient as those who displayed greater levels, when emotional symptoms are accounted for. Those who showed greater levels of emotional symptoms (centred) were about one-and-a-half times less likely to be classified as resilient as those who reported lower levels of emotional symptoms, when hyperactivity was held constant.

4.3. Transition from primary to post-primary school

The current study aims to explore factors and processes associated with academic resilience at different developmental time points and therefore, the same theoretical model is tested at both age levels. While many of the children in the GUI study had made the transition to post-primary school, not all had, and clearly the issue of transition to post-primary does not apply at age nine.

Therefore, transition to post-primary is not considered as part of the theoretical model of resilience in the current study. However, transition from primary to post-primary school is thought to be an important factor to study in relation to the child's development between nine and 13 years old and is therefore considered separately in this section. In wave two of the GUI study, the primary caregivers of children who had made the transition from primary to post-primary school were asked seven questions about their experiences of this transition (the study child *is settling in well into secondary school, misses old friends from primary school, is anxious about making new friends, is coping well with school work, has made new friends, is involved in extra-curricular activities, gets too much homework*). A *transition* scale was constructed by combining responses on these seven questions. The internal consistency of this scale (as measured by Cronbach's alpha) was less than ideal ($\alpha = .587$) however, as the scale had fewer than ten items the mean inter-item correlation for items was considered a more appropriate measure of reliability and a value of .2 was considered adequate (Pallant, 2006). The scale was constructed to have a mean of zero and a standard deviation of one, with high scores indicating a more positive experience of the transition from primary to post-primary school.

Logistic regression analysis was conducted with resilience/vulnerability at age 13 as outcome and transition experience as predictor. The model was statistically significant, χ^2 (1, N=759) = 10,077.01, p<0.001, indicating that a positive transition from primary to post-primary school significantly distinguished between children classified as resilient or vulnerable. Children who experienced a more positive transition were about one-and-a-half times more likely to be classified as resilient as those who had less positive transition experiences (Table 4.40). The variance in resilience status accounted for by a positive transition experience (McFadden's ρ^2=0.96) is extremely satisfactory indicating that the model is a very good fit of the data (Tabachnick & Fidell, 2014).

Table 4.40: Final model of scale measuring transition from primary to post-primary school and resilience, age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Transition	-	1.554	(1.315, 1.837)	0.000

Children who were classified as resilient at both nine and thirteen years old had the highest mean score on the transition scale, indicating they had the most positive experiences (Table 4.41). However, the mean transition score of these children did not differ from those who were classified as resilient at wave one but not at wave two, nor did it differ from those who were classified as resilient at wave two but not at wave one. Similarly, those who were classified as resilient at wave one but not at wave two did not differ from those who were classified as resilient at wave two but not at wave one in terms of their experience of the transition from primary to post-primary school. When considered with the results of the logistic regression analysis presented in Table 4.40, this indicates that resilience status may influence the experience of transition, as well as the experience of transition influencing resilience status. It should also be noted that the *transition* scale was based on parents' reports rather than children's own reports of their experience of the transition from primary to post-primary and results may differ for children's own reports.

Table 4.41: Mean reading and mathematics scores at age nine, by resilience status at age nine and 13

			Transition		
	N	%	Mean		SE
Resilient wave one and two	43	13.6	0.035		0.167
Resilient wave one but wave two	119	37.5	-0.078		0.083
Resilient wave two but not wave one	155	48.9	0.028		0.074
Mean score differences					
			Diff	SED	CI95
Resil. Wave 1 but not 2 – Resil wave 1 and 2			-0.11	0.19	(-0.54, 0.31)
Resil. Wave 2 but not 1 – Resil wave 1 and 2			-0.01	0.18	(-0.42, 0.41)
Resil. Wave 2 but not 1 – Resil. Wave 1 but not 2			0.11	0.11	(-0.15, 0.36)

4.4. Conclusions

This chapter described children classified resilient at age nine and age 13, in terms of their gender, academic achievement, their household income, their social class and the type of school they attended. Of all the children who took part in wave one of the GUI study at age nine, 88% also participated at age 13. A considerable portion of those who did not participate at age 13 were medical card holders at age nine (40%), suggesting a possibly greater attrition rate among children at risk of poverty. The percentage of children with access to a medical card in the sample increased between wave one and wave two, from 28% to 34%, possibly related to the economic crisis that occurred in Ireland in the intervening years.

Twenty-two percent of children had access to a medical card at both age nine and 13 (65% of all medical card holders at age 13), 4% had access to a medical card at age nine but not 13 and 12% had a medical card at age 13 but did not at age nine. This indicates that while poverty is an enduring phenomenon for many, there has been some movement in and out of this classification. Those who retained their medical card status between the two studies have the lowest achievement scores of all children indicating that those who experience persistent poverty have poorer educational outcomes. These findings should be considered in light of the economic crisis that occurred in Ireland in the years between the two waves of data collection. Nine-year-old children whose families had access to a medical card performed significantly less well on the Drumcondra reading and mathematics assessments than all other children, and also had significantly lower equivalised incomes. Similar patterns were also observed at age 13, supporting the assertion that these children are more likely to experience social marginalisation.

In this study, about 3% of children were considered to demonstrate greater levels of resiliecet at age nine and 3.5% did so at age 13, that is they had reading and mathematics (or verbal reasoning and numerical ability at age 13) scores that are at least half a standard deviation above the means for all children. Of those who were considered to demonstrate greater levels of resilience at age nine, 27% were also considered to do so at age 13, while just over 2% were considered vulnerable. Of those who were classified as vulnerable at age nine, 0.6% were classified as resilient at age 13, while just under 7% of children who had access to a medical card but who were neither classified as resilient nor vulnerable at age nine were considered to be demonstrate greater levels of resilience at age 13. These findings highlight the considerable variability in resilience status among children in this study. There is evidence that the resilience classification changed for many children due to the arbitrary nature of the cut points used for resilience in this study. The mean test scores of children who were considered as more resilient at age nine, but not at age 13, and those who were classified as more resilient at age 13 but not at age nine, were just below the cut points used for resilience classification in each wave of the study. Therefore it appears that small changes in performance over time could lead to changes in classification of resilience. This has important implications for definitions of resilience, many of which rely on arbitrary cut points.

Children who display greater levels of resilience significantly outperform more vulnerable children (those performing at or below the mean for all children with access to a medical card) as well as children whose families do not have access to a medical card at both age levels. Interestingly, children classified as resilient also obtained considerably higher scores than the national means (about one standard deviation), indicating that these children are among the highest achieving children nationally and not just among children from poorer backgrounds. Nine-year-old children who are more resilient come from families who have a considerably lower mean income than the national mean and a significantly lower mean income than the families of children who do not have access to a medical card. However, the mean income of these children's families is significantly above the mean income reported by the families of more vulnerable children at age nine. This is somewhat different to the pattern observed at age 13, where the mean income of more resilient children did not differ significantly from that of more vulnerable children and 'other medical card holders', suggesting that the relationship between family income and children's outcomes may differ at age nine and 13. These findings should also be considered in light of the economic crises that occurred in the country in the years intervening the two waves of the study.

Also, while a greater proportion of children classified as resilient have parents whose occupation falls into the professional/managers category when compared to more vulnerable children, the families of both children classified as vulnerable or resilient are less likely than expected to have parents whose occupation falls into this category at both age levels. These findings suggest that there may be some relationship between cultural capital and achievement (and therefore resilience) among children whose families have access to a medical card at both age levels.

While there is an almost even proportion of boys and girls in the overall GUI samples in wave one and wave two, fewer boys than girls have access to a medical card in both waves, suggesting that boys from poorer backgrounds are underrepresented in the GUI samples. In addition, more boys than girls were classified as resilient. These findings suggest that the most vulnerable boys (in terms of family income and also performance in school) did not participate in the GUI study.

This chapter also outlined the results of 23 logit models (12 at age nine and 11 at age 13) testing significant predictors of resilience. The logit models were tested under seven heading, selected based on a review of the resilience and education literature. All of the 23 models tested at ages nine and 13 were found to be statistically significant, indicating that each of the factors (considered to be indicators of economic, cultural and social capital) measured significantly distinguish between children classified as resilient or vulnerable and supports the assertion that the seven categories outlined are key elements of a child's life related to resilience.

However, the variance for many of the models tends to be low, suggesting that individually the models are not particularly strong at predicting resilience. Also, the pattern of variance explained by some of the models differs somewhat at age nine and 13. For example, the variance explained by background characteristics, parental involvement and psychological adjustment is satisfactory or highly satisfactory at age nine but is small at age 13. Similarly, the variance explained by the child's self-concept and engagement in school at age nine is small but is much lower at age 13 than at age nine. On the other hand, the variance explained by the child's lifestyle is highly satisfactory at age 13 but is small at age nine. While the variance explained by parents' educational expectations for their child is small at age nine and 13, the variance explained by the child's own educational expectations is excellent at age 13, suggesting that the child's own expectations have a greater association with resilience than the parents' expectations for their child at age 13.

Nevertheless, there are some relatively consistent patterns across the two age groups in terms of the variance explained by the models. The variance explained by the child's relationship with their family is highly satisfactory at both age levels. Also at both age levels, the variance explained by children's attitudes towards school is very small. These findings indicate that at both age levels, children's attitudes, as measured in the current study, contribute relatively little to a child's resilience, while their relationship with their family contributes much more and this is a persistent predictor of resilience.

While some of the differences in the amount of variance explained in corresponding models may be due to differing relationships between factors and resilience at different age levels, it is also likely that changes in the types of measurements used in the GUI study between waves one and two could also explain some of the inconsistencies observed. While it is difficult to quantify the effect of changing measures between the two studies, it seems likely to be small, as some models which had a high level of consistency between the age levels in the measures used, showed large differences in the amount of variance explained, while others which used different measures, explained similar amounts of variance.

In terms of the variables that are unique predictors of resilience, some consistencies and some variations occur between age nine and 13. For example, parental education level is associated with resilience at age nine and 13, such that those whose parents have a higher level of education (i.e., degree or higher) or more likely to be classified as resilient. Also, children whose parents help them with their homework more often are less likely to be classified as resilient, suggesting that parents are more likely to help their children with homework if they are weaker students (and therefore need help with their homework). Children who have a positive attitude towards school are also more likely to be classified as resilient at both age levels. In contrast, those who are more disengaged from school are less likely to be classified as resilient at age nine and age 13, although the variance in resilience accounted for by children's attitudes towards and disengagement from school tends to be small indicating that these relationships are not very strong.

Children who read for pleasure more often and take part in sports are more likely to be classified as resilient, while those who participate in a homework club are less likely to be classified as resilient at both levels. As with the frequency of parents helping their child with homework, it is possible that the negative relationship between participation in a homework club and resilience is due to such initiatives being targeted at children who are in need of additional support.

Some interesting differences in the associations with resilience are also observed between age nine and 13. For example, while gender was not considered a unique predictor of resilience at age nine, boys were twice as likely to be considered resilient as girls at age 13. Also, children who report greater levels of responsiveness from their mother are slightly less likely to categorised as resilient at age nine, but slightly more likely to be classified as resilient at age 13. Furthermore, while conflict with the primary caregiver is negatively associated with resilience at age nine, conflict with the secondary caregiver predicts lower likelihood of resilience at age 13.

The relationship between the child's experience of the transition from primary to post-primary school and resilience was also explored. Logistic regression analysis revealed that those who experienced a more positive transition (a one standard deviation increase on the transition scale) were about one-and-a-half times more likely to be classified as resilient at wave two than those who experienced a less positive transition. However, no significant differences in the mean scores on the transition scale were noted between those who were classified as resilient at both wave and one and two and those who were classified as resilient at wave one but not wave two, or those who were classified as resilient at wave two but not at wave one. This suggests that the transition experience is unlikely to have influenced any changes in resilience status between wave one and wave two. Indeed, it is possible that a child's resilience status may influence their transition experience as well as the transition experience influencing their resilience status.

It is anticipated that collectively these models will be stronger predictors of resilience. Structural equation modelling that incorporates all 12 logit models at age nine will be used to test this hypothesis and separate structural equation modelling that incorporates all 11 logit models at age 13 will also be tested. Broad comparisons will also be made between the two models in Chapter 5.

Chapter 5. Results – Identifying processes associated with academic resilience

Chapter 4 presented a description of academic resilience in children at nine and 13 years old, and what distinguishes greater levels of academic resilience from academic vulnerability in children at risk of poverty, as well as their more advantaged peers and national averages, in terms of key indicators of social, cultural and economic capital. Unique predictors of a student being classified as more academically resilient or more vulnerable were also identified, separately for nine- and 13-year-old children, using logistic regression analysis. These factors were tested and described under seven categories associated with the main areas of a child's life that have been found to be associated with academic resilience: background characteristics (including gender); relationships with family, teachers and peers; educational aspirations and expectations; attitudes towards school; parental involvement in their child's education; engagement and meaningful participation; and the personal attributes of the child.

This chapter builds on the previous chapter by exploring the associations and processes involved between the unique predictors identified in Chapter 4. In this chapter, a theoretical model of academic resilience, based on the education and resilience literature is described. This model is developed around broad constructs that are considered to be important contributors to academic resilience and positive outcomes throughout a child's life. The unique predictors of academic resilience identified in Chapter 4 were applied to this theoretical model and tested using structural equation modelling (SEM). SEM is a confirmatory technique and the aim of this study is to test and confirm (or not) a theoretical model of academic resilience.

As in Chapter 4, separate models were tested at nine and 13 years old. While the individual predictors of academic resilience differ somewhat between the two age groups (see Chapter 4) the same theoretical model was applied. In this way, the application of the theoretical model can be tested at different developmental stages of the child. <u>The term 'resilience' will be used to refer to academic resilience in the remainder of this chapter.</u>

5.1. Analytic strategy

1. First, a theoretical model of resilience was developed, based on a review of the resilience and educational achievement literature, which is presented in chapters 1 and 2. The theoretical model aims to be a multi-dimensional model of resilience, bringing together factors associated with resilience from across a child's life and linking them in such a way as to present as complete a model of resilience as possible. A review of the literature identified seven main areas of a child's life that are associated with resilience (see Chapter 3) and these seven areas, which were used to categorise the predictors of resilience in Chapter 4, were also used to organise the theoretical model of resilience.
2. Using the unique predictors of resilience identified in Chapter 4 and applying them to the theoretical model of resilience, two separate hypothesised models of resilience (one at age nine and one at age 13) were developed. Every effort was made to match measured variables to the relevant hypothesised variables. While not all variables identified in the logistic regression models in Chapter 4 are exact measures of the latent variables outlined in the theoretical model, all variables are considered to at least act as proxies for each of the latent constructs contained in the theoretical model. In some instances, where no variables in a given section were found to be significantly associated with resilience in the logistic regression analyses, this section was unaccounted for in the hypothesised model. Also, due to different measures being used in the two waves of the child cohort of the Growing Up in Ireland (GUI) study and changes in the relationship between some variables and resilience between nine and 13 years old, some constructs in the theoretical model are represented by different variables at nine and 13 years old. Furthermore, as some of the seven categories used to organize the unique predictors of resilience are interrelated, some cross-over of variables may occur (e.g., variables measuring the child's relationship with their family and their engagement with their family contribute to the 'positive family environment' factor)
3. Before testing each hypothesised model, the assumptions of multivariate normality and the absence of multicollinearity were tested using IBM SPSS Statistics 23. The rate of missing data for children demonstrating greater levels of resilience was also compared against all other children for each variable in the models. Each hypothesised model was then tested using M*plus* 6, using data from all children considered to be at risk of

poverty in the GUI dataset (i.e., full medical card holders) at waves one and two of the child cohort. Prior to testing the full hypothesised model, Exploratory Factor Analyses (EFA) and, where relevant, Confirmatory Factor Analyses (CFA) were conducted to test the measurement model (i.e., the relationships between the observed indicator variables and the underlying constructs they are designed to measure or the latent variables). Any post-hoc modifications that were applied during CFA (to create better fitting and more parsimonious models) were applied to the overall hypothesised model before testing. Models were assessed according to how well the model represents the data.

4. Finally, post-hoc modifications were applied to the overall hypothesised models to present the most parsimonious models that also best fit the data and theoretical considerations. Non-significant paths were removed one-at-a-time and DIFFTEST[17] analysis was used to establish if removal of paths significantly altered the model. Where significant differences were found, the paths remained in the model. The sequence of deleting non-significant relationships was decided in accordance with Bronfenbrenner's bio-ecological model of child development, i.e., variables perceived to be further from the child's immediate environment were deleted first. Once all relevant non-significant paths were removed, new paths were considered based on suggestions arising from the modification indices presented in M*plus* 6, theoretical insight and judgement by the researcher. Any modifications to the hypothesised model were kept to a minimum and only applied if significant improvements to the model fit were observed, without compromising the theoretical integrity of the model.

Sometimes the term causal modelling is used to refer to SEM. As Ullman (2014) notes, attributing causality is a design issue and not a statistical issue. The design used in the current study is non-experimental, therefore causality is not inferred. As recommended by Aitkin, Francis and Hinde (2005), and as with previously-reported hierarchical linear models of Irish

[17] The DIFFTEST option is used in M*plus* 6 to obtain a correct chi-square difference test when the weighted least squares with means and variances adjusted (WLSMV) estimator is used because the difference in chi-square values for two nested models using the WLSMV chi-square values is not distributed as chi-square (Muthen & Muthen, 2010).

students (e.g., Cosgrove, Shiel, Sofroniou, Zastrutzki, & Shortt, 2005) weights were not applied for structural equation modelling.

5.1.1. Model fit indices

Three indices of model fit are provided with the weighted least squares with means and variance adjusted (WLSMV) estimator in M*plus* 6 and are used to assess model fit in the structural equation models in this chapter. The first measure is the chi-square value. While the chi-square value is the traditional measure for evaluating overall model fit, it assumes multivariate normality and deviations from normality may result in model rejections even when the model is properly specified (McIntosh, 2006). The chi-square value is also sensitive to sample size and nearly always rejects the model when large samples are used (Hooper, Coughlan & Mullen, 2008). For these reasons, the chi-square statistic was deemed to be an inappropriate measure of model fit in the current study. Instead, a simple method of dividing the chi-square value by the degrees of freedom (which norms the chi-square figure) is used to assess model fit in the current study (Wheaton, Muthen, Alwin & Summers, 1977). Values of up to three are generally taken to indicate a well-fitting model and this is the cut point used in this study.

The Comparative Fit Index (CFI; Bentler, 1990) is the second index of model fit used to evaluate the structural equation models in this chapter. The CFI belongs to the category of incremental fit indices and measures 'proportionate improvement in model fit by comparing the hypothesised model in which structure is imposed with the less restricted nested baseline model' (Byrne, 2012; p70). Yu (2002) has stated that a cutoff of >.95 can be an indication of a good model with binary outcomes and even with severely non-normal data. The CFI is one of the measures least effected by sample size (Hooper et al., 2008), however it does pay a penalty for every parameter estimated and therefore is sensitive to model complexity (Kenny, 2015).

The third index used to evaluate the structural equation models in the current study is the Root Mean Square of Error Approximation (RMSEA; Steiger & Lind, 1980). The RMSEA belongs to the category of absolute fit indices and determines how well the model fits the sample data rather than the extent of model improvement. The RMSEA takes into account the error of approximation in the population and indicates how well the model, with unknown but optimally chosen parameter estimates, would fit the populations' covariance matrix if it were available (Byrne, 2012). The RMSEA has become regarded as 'one of the most informative fit indices' (Diamantopoulos & Siguaw, 2000, p. 85) due to its sensitivity to the number of estimated parameters in the model. MacCallum and Austin (2000) have strongly recommended the routine use of RMSEA as it is adequately sensitive to model misspecification, commonly used interpretive guidelines appear to yield appropriate conclusions regarding model quality and it is possible to build confidence intervals around RMSEA values. A value of .06 or below has been recommended as indicating good model fit (Hu & Bentler, 1999) and according to Yu (2002) can be an indication of a good model with binary outcomes and even with severely non-normal data.

There is much debate around the use of model fit statistics and as Hooper et al. (2008) note, there is a 'disparity in agreement on not only which indices to report but also what the cut-offs for various indices actually are' (p.53). In the current study, the final models are assessed with respect to the three model fit statistics outlined above using the following cut-points as an indication of good model fit:

- Chi-square (normed) ≤3;
- CFI >.95; and
- RMSEA <.06.

It has been argued that the CFI should not be computed if the RMSEA of the null model is less than .158 (Kenny, 2015), as an incremental measure of fit may not be informative if the RMSEA is below .158. A null model with an RMSEA of less than .158 indicates that the null model is not a very poor fit of the data and therefore the final model cannot offer much of an improvement over the null model in terms of explaining the phenomenon of interest. Therefore, many alternative models may fit the data just as well as, or better than, the preferred model. Thus, when assessing model fit in the current study the RMSEA of the null model is also considered.

5.2. Theoretical model

A theoretical model of resilience is presented in Figure 5.1. This model is colour coded to match the hypothesised and final models tested at nine and 13-years-old. This model was formulated from a review of the findings of academic and educational resilience as well as the educational achievement literature (presented in chapters 1 and 2) and, as such, all variables are represented as latent variables.

Socioeconomic background, parental involvement and educational expectations

Schoon, Parsons and Sacker (2004) note that greater levels of communication between parents and their child's school and higher levels of parental involvement in their child's education can lead to greater expectations for their child's educational outcomes. Also, Cooper and Crosnoe (2007) found that the effects of family socioeconomic background are mediated through socialisation experiences within the family. As noted in Chapter 1, measures of socioeconomic status vary considerably in the literature but generally include a measure of family income, parental education level and parental occupation. Therefore, the theoretical model of resilience in the current study hypothesised that family income, parental education level and parental occupation status are directly related to parents educational expectations for their child and these relationships are also facilitated through parental involvement in their child's education and parental communication with their child's school. Parental communication is also hypothesised to be associated with parents' involvement in their child's education in the theoretical model.

Parents who are directly involved in their child's education and who have higher educational expectations for their child can influence their child's own educational expectations and engagement in education by encouraging them to succeed academically (Schoon et al., 2004; Sacker & Schoon, 2006). It is also likely that children who have higher expectations for themselves will engage with school to a greater degree, therefore parental expectations are hypothesised to be associated with the child's own expectations; and both parental and child expectations are hypothesised to be directly related to engagement in education in the theoretical model. As children who are academically oriented may be more likely to involve their parents in their education, therefore strengthening educational ties (Crosnoe, 2001), the child's engagement in education is hypothesised to covary with their parent's involvement in their education in the theoretical model.

Relationships with family; parental involvement and personal attributes of the child

Parents model behaviour for their children and can affect children's psychological adjsutment and self-concept (Darling & Steinberg, 1993; Aunola, Stattin & Nurmi, 2000). Parenting style influences parent-child relationships and is therefore considered to contribute to the family environment. Positive family relationships have also been found to be related to resilience (Nettles, Mucherach & Jones, 2000) and it is likely that a more positive family environment facilitates greater levels of familial support and involvement, both educationally and socially. Therefore in the theoretical model, family environment is associated with the child's psychological adjustment, self-concept and parental involvement in their child's education.

Relationships with teachers and peers; attitudes and engagement in school

It is not just family relationships that can contribute to resilience. Many studies have noted that positive relationships with teachers and peers are important sources of support for at-risk students (Gonzalez & Padilla; 1997; Nettles, et al, 2000). Positive relationships with teachers can not only promote positive self-concept but can also strengthen ties to education by supporting positive attitudes towards and engagement in education, as well as contributing to teacher's expectations of the child and the child's own expectations for themselves. These relationships are reflected in the theoretical model. Teacher expectations have also been found to be associated with children's own expectations, their engagement and their self-concept (Rubie-Davies, 2006) and this is reflected in the theoretical model.

Teachers can also play an important role by bridging the gap between school and home life. Therefore, the teacher's relationship with the child is associated with parental communication in the theoretical model. It is also likely that there is a relationship between teachers' expectations and parents' expectations and these two constructs are hypothesised to covary in the theoretical model. Also, positive relationships with peers can promote a positive attitude towards school and school engagement as well as positive psychological adjustment and self-concept through the internalisation of academic related beliefs, goals, values and expectations that are consistent with their peers (Gonzalez & Padilla, 1997; Nettles et al., 2000) and these relationships are reflected in the theoretical model.

Engagement in school and extra-curricular activities

As well as engaging in school to a greater extent, students who display resilience have also been found to be more likely to participate in extracurricular activities (Catterall, 1998). Greater levels of engagement, in extra-curricular activities and school, can lead to the acquisition of new skills which, in turn, can promote a more positive self-concept, greater levels of motivation, and more positive psychological adjustment and more positive attitudes. In the theoretical model of resilience, engagement in extracurricular activities and school is associated with psychological adjustment and self-concept, while psychological adjustment and self-concept are associated with resilience. Psychological adjustment is also considered to be related to self-concept in the theoretical model. Also, engagement in education is associated with attitudes towards education and is also hypothesised to be directly related to resilience.

Gender and resilience

Previous research has found mixed results in terms of gender differences in resilience (Martin & Marsh, 2006; Finn & Rock, 1997). However, literature on gender differences in academic performance among school-going children in Ireland has hypothesised that differences in factors such in engagement, interest and anxiety have contributed to the gender differences observed in academic achievement (Kavanagh, Shiel, Gilleece & Kiniry, 2015; Perkins & Shiel, 2016). While many of the factors associated with gender differences are subject specific (confidence in reading, mathematics self-efficacy and mathematics anxiety) it is also possible that there are associations between gender and the fundamental constructs that these subject specific factors underlie. Therefore, in the theoretical model, gender is hypothesised to be associated with the child's psychological adjustment, self-concept and engagement in education, as well as being related to academic resilience.

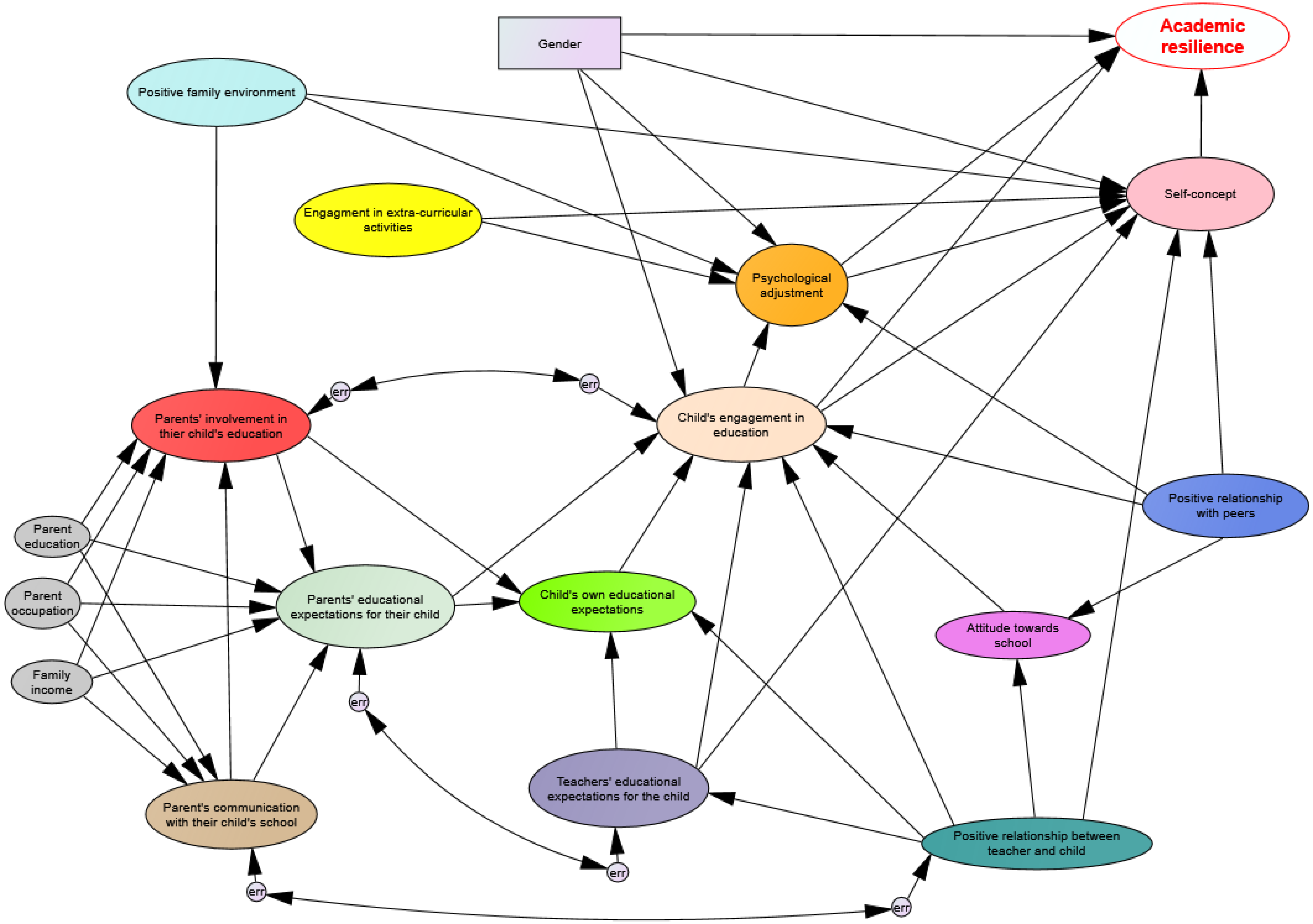

Figure 5.1: Theoretical model of academic resilience

5.3. Hypothesised model – age nine

Using the theoretical model as a framework, the variables that were identified in the logistic regression models as unique predictors of resilience at age nine were arranged into the hypothesised model (each variable is colour coded to correspond with the colour of the associated construct that it is intended to measure in the theoretical model in Figure 5.1). This model was constructed in such a way so as to resemble the theoretical model as closely as possible. The hypothesised model is presented in Figure 5.2. Ovals represent latent variables and rectangles represent measured variables. Measured variables are observed variables that are directly measured, while latent variables are factors that are not directly measured but rather assessed indirectly using three or more measured variables (Ullman, 2014). Absence of a line connecting variables implies lack of a hypothesised direct effect. While not all variables identified in the logistic regression models in Chapter 4 are exact measures of the latent variables outlined in the theoretical model, all variables are considered to at least act as proxies for each of the latent constructs contained in the theoretical model.

Background characteristics

Five variables that measure background characteristics were identified from the GUI dataset (*equivalised income, proportion of income from welfare, household social class* and *highest level of education of parents* and *gender*). Of these variables*, highest level of parental education* and *household social class* were the only variables that remained significant predictors in the final logit model examining the effect of background variables on resilience (see Table 4.17). Therefore, both these variables are included as measured variables in this model.

Parental involvement in education and communication with their child's school

Two variables (*parents attend parent-teacher meetings* and *how often the study child's parent help with their homework*) remained significant predictors of resilience in the final logit model of resilience and parental involvement in their child's education (see Table 4.29). While both these variables are measuring aspects of parental involvement in their child's education, *attendance at parent-teacher meetings*[18] is also measuring an element of 'parental communication with

[18] Due to a lack of variance in this variable it was not included in the final model at age nine.

their child's school'. As scales that measure just one factor require at least three variables to be properly identified (Raubenheimer, 2004), a latent variable for 'parental involvement in their child's education' was not created. Instead, the two variables identified are represented as measured variables in this model.

Educational expectations

One variable was identified as measuring aspects of "parents' educational expectations for their child" (*how far the child's parents expect them to go in education*) and was significantly associated with resilience (Table 4.23). Therefore, in the hypothesised model, 'parents' educational expectations for their child is represented by this measured variable. *Teachers' ratings of the study child's school performance* was also found to significantly predict resilience (Table 4.24) and was included as a latent variable with seven indicators (ratings of comprehension, reading, problem solving, writing, mathematics, oral communications, and creativity) as a proxy for 'teacher educational expectations for the study child'. One variable measured the study child's own perception of how they were doing at school, however this variable was not found to be significantly associated with resilience (Table A4.13) and therefore is not included in the hypothesised model, meaning that the construct of child's expectations is not addressed in the hypothesised model of resilience at age nine.

Attitudes towards education

Just one variable (how much the study child *likes school*) remained a significant predictor of resilience in the final logit model of resilience and attitudes towards school (Table 4.27). As scales that measure just one factor require at least three variables to be properly identified (Raubenheimer, 2004), a latent variable for 'attitudes towards school' was not created. Instead, the child *always likes school* is represented as a dummy variable in this model.

Relationship with family, teachers and peers

Of the 18 variables measuring the child's 'relationship with their family' that were tested as predictors of resilience five remained significant in the final logit model (*mother's responsiveness, conflict with primary caregiver, dependence on primary caregiver, positive relationship with siblings* and *talks to their dad about their problems*). Two variables remained significant predictors of resilience in the final logit model of resilience and engagement with family (*how often the study child reports having a say in what the family does* and the *how often* *the parents talk about things with their child*). Together with the five relationship with family variables, these variables form seven indicators of the latent variable 'family environment' in the hypothesised model.

One variable measuring the 'child's relationship with their peers' was significantly associated with resilience (the child *talks to their friends about their problems*) and was included in the hypothesised model as a measured variable. Variables relating to the child's relationship with teacher were not statistically significant predictors of resilience at age nine (Tables A4.8) and therefore are not included in the hypothesised model, despite these constructs being included in the theoretical model.

Child's engagement

One variable, *how often the study child has incomplete homework*, was found to be significantly associated with resilience in the final logit model of resilience and engagement with school (Table 4.33). Although a measure of disengagement, this variable was included in the hypothesised model, in the form of a measured variable, as a proxy for the child's engagement with education. Five variables measuring the child's lifestyle were significantly associated with resilience (Table 4.31) and four of these (*participation in sports, participation in cultural activities, participation in homework club and time spent reading for pleasure on a normal week day*) are included in the hypothesised model as indicators of the latent variable 'engagement in extracurricular activities'. The fifth variable from the group of variables measuring the child's lifestyle (*time spent with friends outside of school*) is a proxy indicator for the child's relationship with their peers. This variable, along with another indicator of the child's relationship with their peers ('*talks to their friends about their problems'*) are included as measured variables for the 'child's relationship with their peers' construct.

Personal attributes of the child

Children's *behavioural adjustment* and *freedom from anxiety* (measured using the Piers-Harris self-concept scale) were the only variables measuring the child's self-concept which significantly predicted resilience at age nine in the final logit model of resilience and children's self-concept (Table 4.36). As previously outlined, scales that measure just one factor require at least three variables to be properly identified (Raubenheimer, 2004), therefore a latent variable for 'child's self-concept' was not created. Instead, the two variables identified (*behavioural adjustment* and *freedom from anxiety*) are represented as measured variables in this model.

Finally, two variables were found to significantly predict resilience in the final logit model of resilience and the child's psychological adjustment (Table 4.37). These variables (*emotional symptoms* and *hyperactivity*) are indicators for the 'psychological adjustment' latent variable in the hypothesised model. However, as three measured variables were not available, the latent varaibles could not be created and the two variables identified (*emotional symptoms* and *hyperactivity*) are instead represented as measured variables in this model.

Relationships between selected variables

Applying the selected variables to the theoretical model, it was hypothesised that parental expectations for their child's education is directly predicted by parental education level and household social class. An indirect relationship between parental education level and parents' expectations for how far their child will go in education, via attendance at parent-teacher meetings is also hypothesised. Another indirect relationship between household social class and parent's expectations for how far their child will go in education, via attendance at parent-teacher meetings is hypothesised. How often the study child's parents help with their homework is hypothesised to be predicted by parents' attendance at parent-teacher meetings. The relationship between parental education level and parent's expectations for how far their child will go in education is also hypothesised to be mediated by how often the study child's parents help with their homework, as is the relationship between household social class and parents' expectations for how far their child will go in education.

How often the child arrives at school with incomplete homework is hypothesised to covary with how often parents help their child with their homework and also to be directly predicted by parents' expectations for how far their child will go in education. A positive family environment (a latent variable measured by *mother's responsiveness, conflict with primary caregiver, dependence on primary caregiver, positive relationship with siblings, talks to their father about their problems, how often the study child reports having a say in what the family does* and *how often the parents talk about things with their child*) is hypothesised to be directly related to how often a parent helps their child with their homework, as well as the child's self-concept (measured by *behavioural adjustment* and *freedom from anxiety*) and their psychological adjustment (measured by *emotional symptoms* and *hyperactivity*). Teachers' ratings of the study child's school performance (a latent variable measured by ratings of *comprehension, reading, problem solving, writing, mathematics, oral communications* and *creativity*) is also hypothesised to be directly related to a child's self-concept, as well the frequency with which a child attends class with incomplete homework and is expected to covary with parents expectations for how far their child will go in education.

It is also hypothesised that the amount of time a child spends with their friends and whether they talk to their friends about their problems is directly related to how often the study child has incomplete homework, aspects of their psychological adjustment (specifically *emotional symptoms* and *hyperactivity*), aspects of their self-concept (specifically *behavioural adjustment* and *freedom from anxiety*) and the extent to which they like school. The extent to which a child likes school is hypothesised to directly predict the frequency of incomplete homework. Aspects of a child's self-concept (*behavioural adjustment* and *freedom from anxiety*) is hypothesised to be predicted by aspects of their psychological adjustment (*emotional symptoms* and *hyperactivity*) and aspects of their psychological adjustment and self-concept are hypothesised to be predicted by how often the study child has incomplete homework. Furthermore, it is hypothesised that involvement in extracurricular activities (a latent variable measured by *participation in sports, participation in cultural activities, participation in homework club* and *time spent reading for pleasure on a normal week day*) predicts aspects of a child's self-concept and psychological adjustment. How often the study child has incomplete homework, aspects of their self-concept and psychological adjustment are hypothesised to be directly related to resilience.

Gender was not found to be a significant predictor of resilience at age nine (when other background characteristics were accounted for) and therefore is not included in the hypothesised model of resilience at age nine.

5.3.1. Assumptions

Before the hypothesised model was tested, the assumptions of multivariate normality and the absence of multicollinearity were tested. The assumption of multivariate normality was evaluated for all continuous variables through IBM SPSS 23 using the Shapiro-Wilk test of normality and was found to be violated (i.e., $p<.05$; see Table 5.1). However, as the WLSMV estimator is used for estimating the model in this study (as some of the dependent variables in the model are categorical) and this estimator is considered appropriate for non-normal data (Muthen, 2001) it was deemed reasonable to proceed with analysis.

All variables were tested for multicollinearity in IBM SPSS 23 before being tested together in the model, with tolerance values of .10 or below and VIF values of 10 or above considered to indicate that the multicollinearity assumption was violated. In the current analyses, tolerance values were all at or above .641 and VIF values were all at or below 1.687 therefore the multicollinearity assumption was not violated. All correlation coefficients between variables were also below r=.459

The dataset contains data for 1614 children. The rate of missing data for children demonstrating greater levels of resilience against all other children was compared for each variable in the model, and data was found to be missing at random (i.e., the discrepancy in the missing data rate between children classified as more resilient and other children was less than five percentage points for all variables; see Table A5.1 in Appendix C).

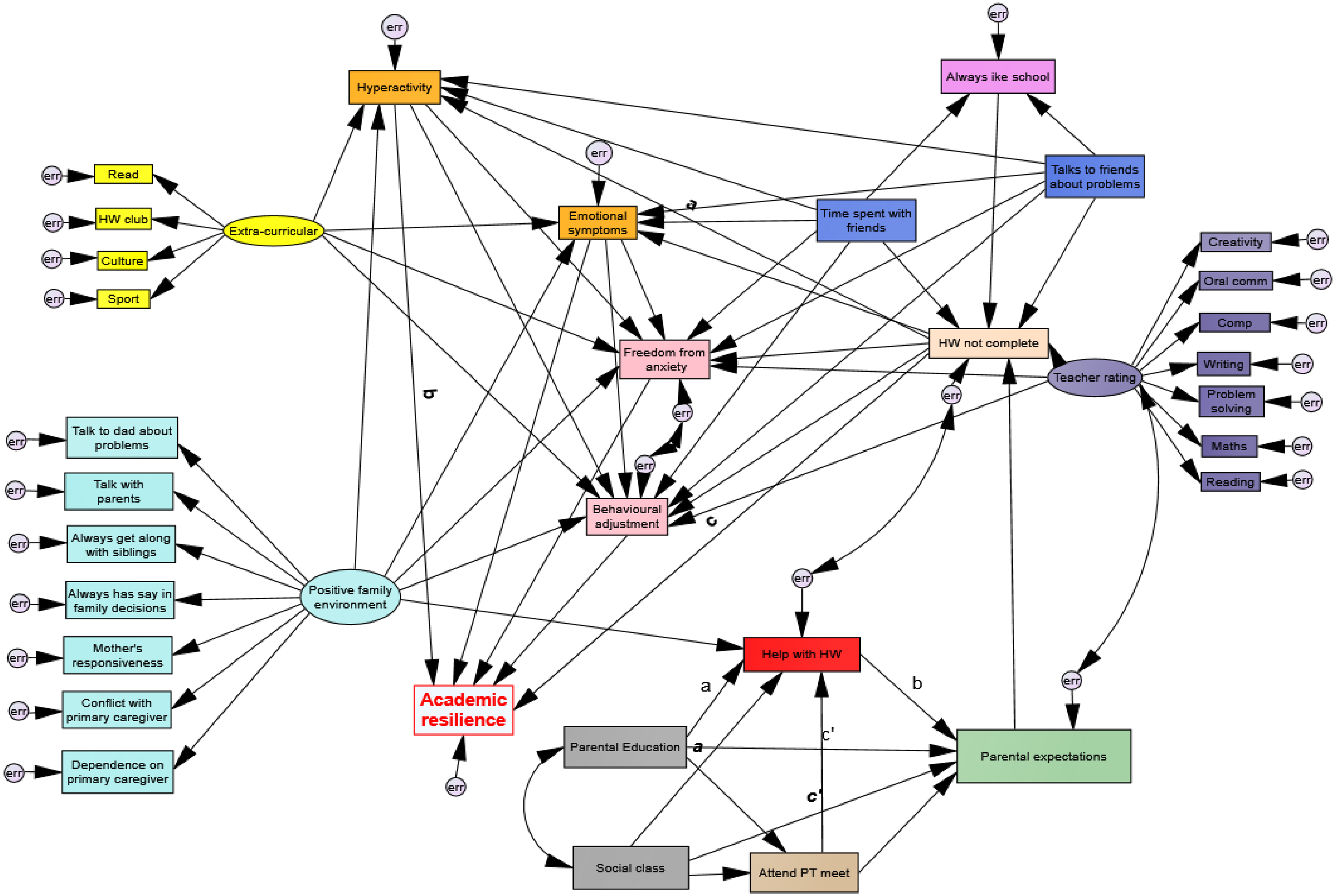

Figure 5.2: Hypothesised model of academic resilience – age nine

Table 5.1: Results from the Shapiro-Wilks Test of Normality for all scale variables included in the hypothesised model – age nine

Variable	Statistic	df	*p*
Time spent reading for pleasure	.761	1069	.000
Frequency parents help with homework	.781	1069	.000
Time spent doing things with friends outside of school	.867	1069	.000
Parent's expectations of how far their child will go in education	.869	1069	.000
Time parents spend talking about things with child	.540	1069	.000
Parental education level	.893	1069	.000
Behavioural adjustment	.856	1069	.000
Freedom from anxiety	.926	1069	.000
Emotional symptoms (parent report)	.897	1069	.000
Hyperactivity (teacher report)	.881	1069	.000
Dependence on primary caregiver	.986	1069	.000
Conflict with primary caregiver	.903	1069	.000
How often child arrives at school with incomplete homework	.670	1069	.000
Mother's responsiveness	.912	1069	.000
Household social class	.933	1069	.000

5.3.2. Measurement model – age nine

Before the structural model was tested, Exploratory Factor Analyses followed by Confirmatory Factor Analyses, where relevant, were conducted to test the measurement model.

5.3.2.1. <u>Exploratory Factor Analysis</u>

Three latent variables ('extra-curricular activities', 'teacher rating of school performance' and 'positive family environment'), formed from questionnaire items, are specified in the hypothesised model. Exploratory Factor Analysis was conducted using IBM SPSS 23. Suitability for factor analysis was established using the Kaiser-Meyer-Olkin value (with values of .6 or above deemed acceptable) and by examining the correlation matrix (with it deemed necessary that at least some correlation coefficients of .3 or above should be present in order for factor analysis to proceed; Pallant, 2006).

Four variables (*child participates in sports, participates in cultural activities, participates in homework club* and *time spent reading for pleasure*) are hypothesised to be indicators for the latent variable 'extra-curricular activities' in the hypothesised model. Exploratory factor analysis, using principal components analysis, was conducted using these four variables. Prior to analysis, the suitability of the data for factor analysis was assessed and given that the correlations between variables were all below .132 and the Kaiser-Meyer-Olkin value was .504, the data were deemed inappropriate for factor analysis. Therefore it was decided to include the four indicator variables in the model as measured variables rather than as indicators of the latent variable 'extra-curricular activities.'

Seven variables (rating of *comprehension, reading, problem solving, writing, mathematics, oral communications,* and *imagination/creativity*) are hypothesised to be indicators of the latent variable 'teacher rating of school performance.' Principal components analysis was conducted with these variables (see Table A3.11 in Appendix A) and analysis revealed one component with eigenvalues exceeding 1 (Figure A3.1), explaining 69.14% of the variance.

Seven variables (*mother's responsiveness, conflict with primary caregiver, dependence on primary caregiver, always gets along with siblings, always has a say in family activities, the child talks to their dad about their problems* and *how often parents talk with their child*) are hypothesised to be indicators of the latent variable 'positive family environment.' Exploratory factor analysis, using principal components analysis, was conducted using these seven variables. Prior to analysis the suitability of the data for factor analysis was assessed. As all correlations were below .244 and the Kaiser-Meyer-Olkin measure of adequacy was .549 the data were deemed to not be appropriate for factor analysis. The seven indicator variables are included in the model as measured variables rather than as indicators of the latent variable 'positive family environment'.

5.3.2.2. Confirmatory Factor Analysis (CFA)

To assess the adequacy of the measurement of the hypothesised latent variable *teachers' ratings of school performance,* confirmatory factor analysis was performed, through M*plus* 6, for the seven variables measuring teacher's ratings of the study child's performance in school.

The hypothesised CFA model

The hypothesised model is presented in Figure 5.3 where ovals represent latent variables and rectangles represent measured variables. Absence of a line connecting variables implies no hypothesised direct effect. A one-factor model of teacher's rating of child's school performance is hypothesised. The ratings of *comprehension, reading, problem solving, writing, mathematics, oral communications,* and *imagination/creativity* variables serve as indicators of the 'teacher's rating of school performance' factor.

Model estimation of teachers' ratings of school performance

Maximum likelihood estimation was employed to estimate the model. The independence model that tests the hypothesis that all variables are uncorrelated was rejected, χ^2 (21, N = 1568) = 7803.49, p <.01, comparative fit index (CFI) = .00, root mean square error of approximation (RMSEA) = .486. The hypothesised model was tested next and while some of the model fit statistics indicated that the model did not fit the data well, χ^2 (14, N = 1568) = 611.671, p <.01, CFI = .923, RMSEA = .165, there was an improvement in fit between the independence model and the hypothesised model.

Post hoc model modifications were performed in an attempt to develop a better fitting model and a correlation between teacher's ratings of the study child's mathematics and problem-solving performance was deemed plausible and added. The addition of this correlation led to an improvement in the model fit indices, χ^2 (13, N = 1568) = 158.025, p <.01, CFI = .981, RMSEA = .084, although not all indices reached the cut-points associated with good model fit (i.e., chi square/df=0.2 which is >3; RMSEA >.06). The final model is illustrated in Figure 5.4.

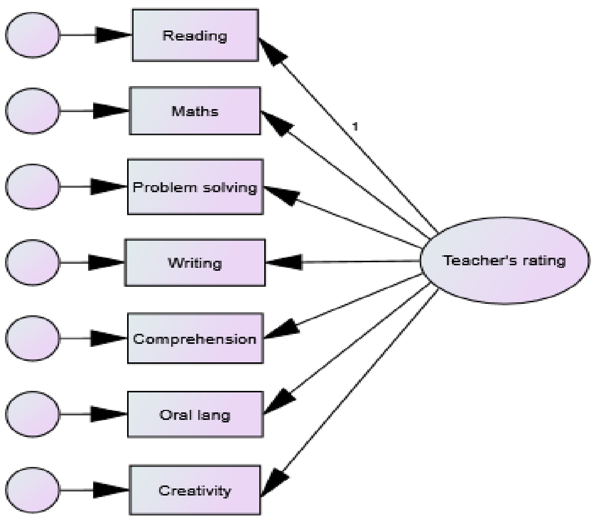

Figure 5.3: Hypothesised model of confirmatory factor analysis for the latent variable measuring teachers' ratings of school performance – age nine

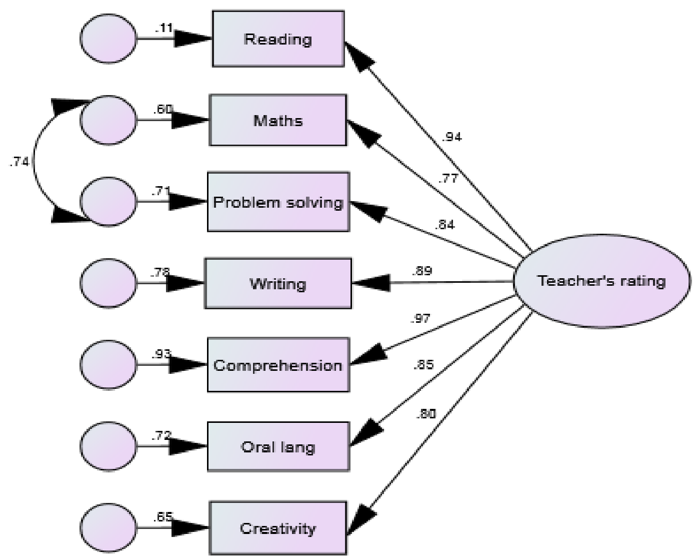

Figure 5.4: Final model of confirmatory factor analysis for the latent variable measuring teachers' ratings of school performance – age nine

5.3.3. Structural model – age nine

5.3.3.1. The hypothesised model

The hypothesised model which is tested is comprised of the hypothesised model presented in Figure 5.2, taking account of modifications that were made to produce the final model from the confirmatory factor analysis (i.e., the variables measuring extra-curricular activities and positive family environment are presented as measured variables; and a correlation was added between teachers' ratings of the study child's mathematics and problem-solving performance).

5.3.3.2. Model estimation

As at least one of the dependent variables in the hypothesised model was categorical, WLSMV estimation was used to fit the model using M*plus* 6.

The independence model that tests the hypothesis that all variables are uncorrelated was rejected, χ^2 (496, N = 1614) = 7371.330, p <.01, CFI = .000, RMSEA = .093. Next, the hypothesised model was tested and although an improvement on the null model, some model fit indices indicated that the model did not fit the data well, χ^2 (318, N = 1264) = 1105.268, p < .01, CFI = .845, RMSEA = .044. Post hoc modifications were performed in an attempt to develop a better fitting and more parsimonious model. Non-significant paths were removed one-at-a-time and DIFFTEST analysis was used to establish if removal of paths significantly altered the model. Where significant differences were found, or where removal resulted in a poorer fitting model (based on CFI and RMSEA values), the paths remained in the model. The sequence of deleting non-significant relationships was decided in accordance with Bronfenbrenner's bio-ecological model of child development, i.e., variables perceived to be further from the child's immediate environment were deleted first. The sequence of removal of non-significant relationships is presented in Table A5.2. In this table, 'ON' refers to 'regressed on' and 'WITH' refers to 'correlated with.'

A number of modifications were suggested by M*plus* 6, however due to a lack of theoretical relevance, no additional relationships were added to the model. The fit statistics of the final model show that the final model is an improvement on the null model, χ^2 (376, N = 1264) = 1159.817, $p < .01$, CFI = .845, RMSEA = .041 (CI RMSEA: .038, .043). The final model is presented in Figure 5.5 (and the standardised and unstandardised coefficients are presented in Table 5.2).

5.3.3.3. **Model fit**

A CFI value of .845 in the current model indicates that the final model is an improvement on the null model in terms of model fit but is below the cut-off value which indicates a well-fitting model (i.e., .95). On the other hand, the RMSEA (.041) indicates that the model fits the data well. However, the RMSEA for the null model was .093, indicating that the pathways specified in the final model do not offer a considerable improvement over the null model (which hypothesises that all the variables are uncorrelated) in terms of explaining resilience. Therefore, it is likely that alternative models, specifying different pathways, may be as good as or better than the current model at explaining the pathways associated with resilience. As the chi-square goodness of fit statistic assumes multivariate normality (which was violated in the current model), a simple method of norming the chi-square figure by dividing by the degrees of freedom was used in the current study, with values of up to three considered to indicate a well-fitting model. Using this method for the current model (1159.817/376) resulted in a value of 3.08 which is just above the cut-off value recommended to indicate a well-fitting model. When all the model fit statistics for the current model are considered together, it is concluded that there is little support for the final model of resilience at age nine.

Table 5.2: Unstandardised coefficients, standardised coefficients, and significance levels for model in Figure 5.5

Parameter estimate	Unstandardised (SE)	Standardised	*p*
Measurement model			
Teacher ratings ➔ reading	1.000* (.000)	.826	NA
Teacher ratings ➔ writing	.939 (.038)	.795	.000
Teacher ratings ➔ comprehension	1.024 (.037)	.874	.000
Teacher ratings ➔ maths	.834 (.044)	.712	.000
Teacher ratings ➔ creativity	.725 (.037)	.687	.000
Teacher ratings ➔ oral communication	.799 (.036)	.733	.000
Teacher ratings ➔ problem solving	.874 (.043)	.767	.000
Covariance maths and problem-solving rating	.096 (.007)	.495	.000
Structural model			
Teacher ratings ➔ regularly has incomplete homework	-.118 (.017)	-.884	.000
Teacher ratings ➔ freedom from anxiety	.351 (.053)	.200	.000
Teacher ratings ➔ behavioural adjustment	.348 (.054)	.199	.000
Regularly has incomplete homework ➔ resilience	-9.251 (1.422)	-.698	.000
Emotional symptoms ➔ resilience	-.145 (.049)	-.146	.003
Conflict with primary caregiver ➔ emotional symptoms	.324 (.027)	.325	.000
Dependence on primary caregiver ➔ emotional symptoms	.222 (.028)	.220	.000
Regularly has incomplete homework ➔ emotional symptoms	1.467 (.433)	.110	.000
Time spent with friends ➔ emotional symptoms	-.025 (.012)	-.057	.031
Reading for pleasure ➔ hyperactivity	-.120 (.026)	-.134	.000
Engages in cultural activities ➔ hyperactivity	-.244 (.059)	-.121	.000
Member of a homework club ➔ hyperactivity	.206 (.079)	.069	.009
Parent talks with child ➔ hyperactivity	-.154 (.041)	-.101	.000
Conflict with primary caregiver ➔ hyperactivity	.161 (.027)	.166	.000
Regularly has incomplete homework ➔ hyperactivity	5.863 (.856)	.449	.000
Hyperactivity ➔ behavioural adjustment	-.147 (.029)	-.146	.000
Reading for pleasure ➔ behavioural adjustment	.085 (.028)	.094	.003
Mother's responsiveness ➔ behavioural adjustment	.096 (.028)	.097	.001
Conflict with primary caregiver ➔ behavioural adjustment	-.124 (.028)	-.126	.000
Emotional symptoms ➔ freedom from anxiety	-.139 (.028)	-.141	.000
Member of a sports club ➔ freedom from anxiety	.179 (.059)	.088	.002
Mother's responsiveness ➔ freedom from anxiety	.058 (.028)	.059	.037
Parental expectations ➔ regularly has incomplete homework	-.006 (.002)	-.145	.002
Time spent with friends ➔ child always likes school	-.013 (.006)	-.069	.028
Frequency parents help with homework ➔ parental expectations	-.164 (.043)	-.096	.000
Parental education level ➔ parental expectations	.266 (.024)	.325	.000
Parental education level ➔ frequency parents help with homework	.048 (.015)	.101	.001
Household social class ➔ Frequency parents help with homework	-.198 (.048)	-.211	.000
Dependence on primary caregiver ➔ Frequency parents help with homework	.070 (.034)	.062	.041
Covariance parental expectations and teacher rating of performance	.272 (.034)	.110	.000
Covariance behavioural adjustment and freedom from anxiety	.378 (.028)	.428	.000
Covariance parental education level and household social class	1.147 (.106)	.400	.000

Note: * the unstandardised coefficient for the first indicator for latent variables is set to 1.

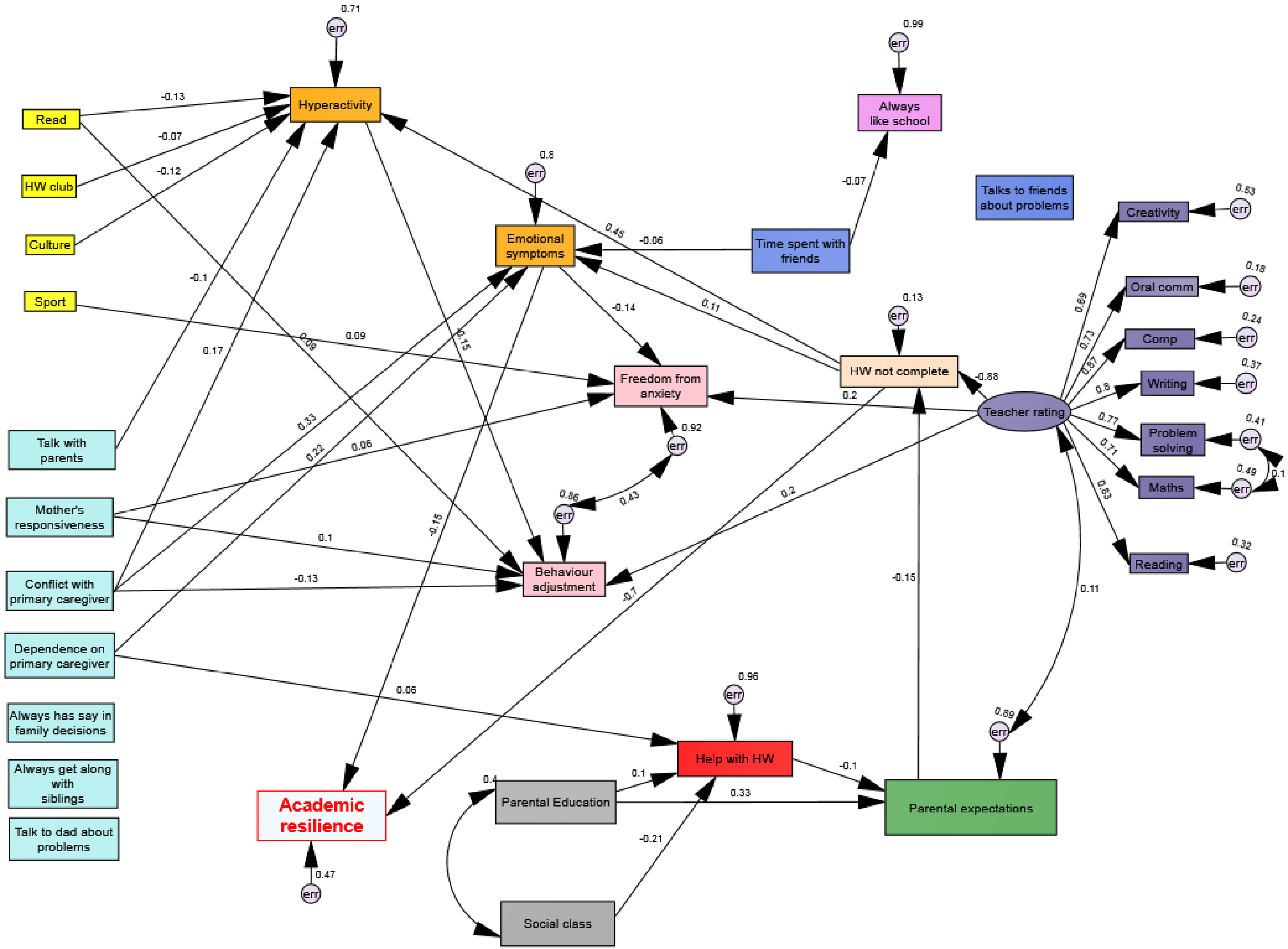

Figure 5.5: Final model of academic resilience – age nine (with standardised coefficients)

5.3.3.4. Direct effects in the final model of resilience – age nine

This section presents a description of the direct paths that remained in the final model of resilience at age nine. All paths described are statistically significant. The direction and strength of individual paths that are described in this section is when all other factors in the model are accounted for. Continuous variables were centred to have a mean score of zero and a standard deviation of one. Average levels refer to the average for children whose families have access to a full medical card and not the national average.

Higher levels of parental education was associated with greater parental educational expectations for their child (both variables are measured in terms of the years spent in education; standardized coefficient = .325, $p < .05$). Less time spent helping the study child with their homework (measured on a scale of 0 [never] to 5 [always]) was also associated with greater parent educational expectations for their child (standardized coefficient = -.096, $p < .05$). Parental education level was associated with the frequency with which parents help their child with their homework, such that those with a higher level of education help their children more frequently (standardized coefficient = .101, $p < .05$). The hypothesised indirect effect of frequency of helping with homework on the relationship between parental education and parental expectations was tested and is presented in the next section.

In contrast to the positive relationship between parental education and helping with homework, household social class was negatively associated with the frequency with which parents help their child with their homework (standardized coefficient = -.211, $p < .05$) indicating that parents with a higher social class (as measured by parental occupation) help their children with their homework less frequently. This is an interesting finding considering the positive correlation between parental education and household social class (standardized coefficient = .400, $p < .05$) and suggests that the relationship between parental education and parental involvement in their child's education may differ according to the occupation of the parent. Such an interaction was not hypothesised in the current study and therefore not tested but may warrant further exploration in future research.

Parental expectations for their child's educational attainment was negatively associated with the child regularly having incomplete homework (standardized coefficient = -.145, $p < .05$). Children whose parents expected them to go further in education had incomplete homework less frequently. Teachers' ratings of school performance was also negatively related to the frequency of a child having incomplete homework (standardized coefficient = -.884, $p < .05$), such that children who had poorer ratings of performance had incomplete homework more frequently. Having incomplete homework more regularly was also associated with above average levels (for this group) of hyperactivity (centred; standardized coefficient = .449, $p < .05$), above average levels of emotional symptoms (centred; standardised coefficient = .110; $p < .05$) and with lower likelihood of resilience (standardized coefficient = -.698, $p < .05$). More time spent with friends outside of school (measured in days) was negatively related to the frequency of the child liking school (standardized coefficient = -.069, $p < .05$) and also with below average emotional symptoms (centred; standardized coefficient = -.057, $p < .05$).

More positive teacher ratings of school performance were associated with above average freedom from anxiety (centred; standardized coefficient = .200, $p < .05$) and above average behavioural adjustment (centred; standardized coefficient = .199, $p < .05$). Having a greater level of emotional symptoms (centred) was related to having above average levels of anxiety (i.e., lower freedom from anxiety; standardized coefficient = -.141, $p < .05$), while above average levels of hyperactivity (centred) were associated with below average levels of behavioural adjustment (standardized coefficient = -.146, $p < .05$).

Reading for pleasure more often (measured in hours per day) was associated with below average levels of hyperactivity (standardized coefficient = -.134, $p < .05$) and above average levels of behavioural adjustment (standardized coefficient = .094, $p < .05$). Taking part in a homework club was also related to above average levels of hyperactivity for this group of children (standardized coefficient = .069, $p < .05$), while engaging in cultural activities was associated with below average levels of hyperactivity (standardized coefficient = -.121, $p < .05$). Homework clubs are provided as part of the School Completion Programme (under the DEIS initiative which is targeted at the schools with children experiencing the greatest levels of social marginalisation in Ireland) to offer children extra support after school (Department of Education and Science, 2006). Many children who participate in these clubs do so because of poorer levels of achievement, which, in turn, may be related to other factors such as greater levels of hyperactivity, leading to the overrepresentation of such children in this group as found in the current study. Also, the frequency with which parents talk to their child (measured on a scale of 1 [everyday] to 5 [rarely/never]) was associated with hyperactivity. Children who talk with their parents more often tended to have lower levels of hyperactivity (standardized coefficient = -.101, $p < .05$).

Greater levels of dependence (centred) on the primary caregiver was associated with greater levels of emotional symptoms (standardized coefficient = .220, $p < .05$) and with parents helping their child with their homework more frequently (standardized coefficient = .062, $p < .05$). Children with greater levels of conflict (centred) with the primary caregiver tended to have greater levels of emotional symptoms (standardized coefficient = .325, $p < .05$), greater levels of hyperactivity (standardized coefficient = .166, $p < .05$) and lower levels of behavioural adjustment (standardized coefficient = -.126, $p < .05$). Greater responsiveness from the child's mother was associated with greater levels of behavioural adjustment (standardized coefficient = .097, $p < .05$) and lower levels of anxiety (i.e., greater freedom from anxiety; standardised coefficient = .059, $p < .05$). Being a member of a sports club was associated with lower levels of anxiety (or greater freedom from anxiety; standardized coefficient = .088, $p < .05$).

Above average levels of emotional symptoms (for this group) were related to a lower likelihood of resilience (standardized coefficient = -.146, $p < .05$).

5.3.3.5. Indirect effects in the final model of resilience – age nine

Indirect effects were tested using bias-corrected bootstrapping, which does not rely on the assumption of a normally distributed sampling distribution of the indirect effect, and provides more robust estimates of standard errors and confidence intervals.

Two partially indirect relationships were hypothesised in the model:

1. the relationship between parental education level and parental expectations for their child is mediated by the frequency of parents helping with homework; and
2. the relationship between household social class and parental expectations for their child is mediated by the frequency of parents helping with homework.

Due to the lack of a significant direct relationship between household social class and parental expectations the second indirect relationship was not tested. Direct effects were found between parental education level and parental expectations, and between the frequency of helping with homework and parental expectations (see Table 5.2). However, the relationship between parental education level and parental expectations for their child was not found to be mediated by the frequency with which they help their child with their homework (standardised coefficient = -.010 [CI: -.131, .112]; $p > .05$).

5.3.3.6. Variance explained in the final model of resilience – age nine

Estimates of variance explained are not provided for the whole model in structural equation analysis. Instead, R^2 estimates are provided for each dependent variable. As some of the model fit statistics for the final model indicate that the model is not a good fit of the data, R^2 estimates should be interpreted with caution.

The "teachers' rating of school performance" factor explained 68.3% of the variance in ratings of reading performance, 63.2% of the variance in ratings of writing, 76.3% of the variance in comprehension, 50.7% of the variance in mathematics, 47.2% of the variance in creativity, 53.7% of the variance in oral communication and 58.9% of the variability in problem solving. Just under a third of the variance in hyperactivity (29.2%) is accounted for by frequency of reading for pleasure, engagement in cultural activities, engagement in a homework club, frequency of talking to parents, conflict with primary caregiver and frequency of having incomplete homework.

About one-fifth (20.1%) of the variance in emotional symptoms was accounted for by conflict with the primary caregiver, dependence on the primary caregiver, frequency of incomplete homework and time spent with friends, while 13.5% of the variance in behavioural adjustment was accounted for by teachers' ratings, hyperactivity, time spent reading for pleasure, mother's responsiveness and conflict with the primary caregiver. Just 7.8% of the variance in the child's freedom from anxiety self-concept was accounted for by teachers' ratings, emotional symptoms, membership of a sports club and mother's responsiveness. Teachers' ratings and parental expectations for their child's education accounted for 87.5% of the variation in the frequency with which the child has incomplete homework, while just 4.1% of the variation in the frequency of parents helping with homework was accounted for by parental education level, household social class and dependence on the primary caregiver. Parental education level and the frequency with which parents help with homework accounted for 11.4% of the variance in parental expectations, while just 0.5% of the variance in the frequency with which the child likes school was accounted for by time spent with friends. Finally, 53.1% of the variance in the latent variable underlying the observed variable measuring resilience[19] was accounted for by emotional symptoms and the frequency of having incomplete homework. The model fit statistics for the final model should be taken into consideration when interpreting the variance explained in the dependent variables in the final model and all R^2 estimates should be interpreted with caution.

5.3.4. Nested model – age nine

As noted earlier, the CFI is sensitive to the number of parameters estimated in a model, therefore it is possible that the complex nature of the hypothesised model may have contributed to the relatively low CFI value associated with the final model of resilience. Therefore, it was decided to test a less complex, nested model, testing the relationships between just the variables directly associated with resilience in the hypothesised model.

5.3.4.1. The hypothesised nested model - age nine

The hypothesised nested model which was tested is comprised of the variables that were hypothesised to be directly related to resilience in the hypothesised full model, and is presented in Figure 5.6.

[19] When modelling a relationship with a categorical variable, M*plus* estimates the relationship with the underlying latent variable.

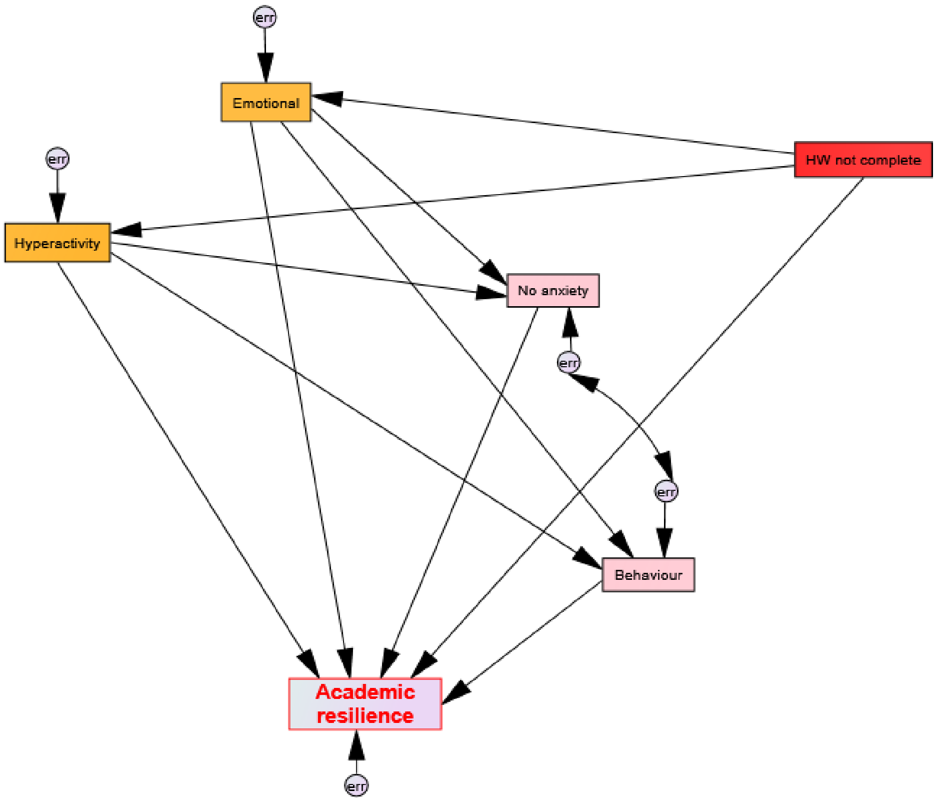

Figure 5.6: Hypothesised nested model of academic resilience – age nine

5.3.4.2. Nested model estimation – age nine

As with the full model, WLSMV estimation was used to fit the nested model using M*plus* 6 as at least one of the dependent variables in the hypothesised nested model was categorical. The independence nested model that tests the hypothesis that all variables are uncorrelated was rejected, χ^2 (15, *N* = 1614) = 586.957, *p* <.01, CFI = .000, RMSEA = .154. The hypothesised nested model was then tested and was found to be an improvement on the null model, χ^2 (3, *N* = 1614) = 22.58, *p* <.01, CFI = .971, RMSEA = .065.

Post hoc modifications were performed in an attempt to develop a more parsimonious model. Non-significant paths were removed one-at-a-time and DIFFTEST analysis was used to establish if removal of paths significantly altered the model. Where significant differences were found, or where removal resulted in a poorer fitting model, the paths remained in the model. The sequence of deleting non-significant relationships was decided in accordance with Bronfenbrenners' bio-ecological model of child development, i.e., variables perceived to be further from the child's immediate environment were deleted first. The sequence of removal of non-significant relationships is presented in Table A5.3.

5.3.4.3. Model fit for the nested model – age nine

The fit statistics of the final model show that the final model is an improvement on the null model, χ^2 (5, N = 1614) = 24.385, p < .01, CFI = .972, RMSEA = .050 (CI RMSEA: .031, .071). In contrast to the full model, the CFI value indicates that the final model is a good fit of the data (i.e., it is >.95). Also, while the RMSEA value also indicates that the model is a good fit of the data (i.e., <.06) the upper level of the confidence interval for the RMSEA is above .06, indicating that it cannot be concluded with certainty that the model fits the data well. Also, given that the RMSEA of the null model was .154, this suggests that the final nested model does not offer much of an improvement over the null model in terms of explaining the relationship between the psychological adjustment, self-concept, engagement and resilience (as noted earlier, Kenny [2015] suggests that the CFI should not be computed if the RMSEA of the null model is less than .158). Moreover, dividing the chi-square figure by the degrees of freedom gives a value of 4.88 which is well above the value considered to indicate a well-fitting model (i.e., three). Therefore, as only one of the model fit statistics provides evidence of good fit, it cannot be concluded with certainty that the final nested model is a good fit of the data. The final nested model is presented in Figure 5.7 and the standardised and unstandardised coefficients are presented in Table 5.3.

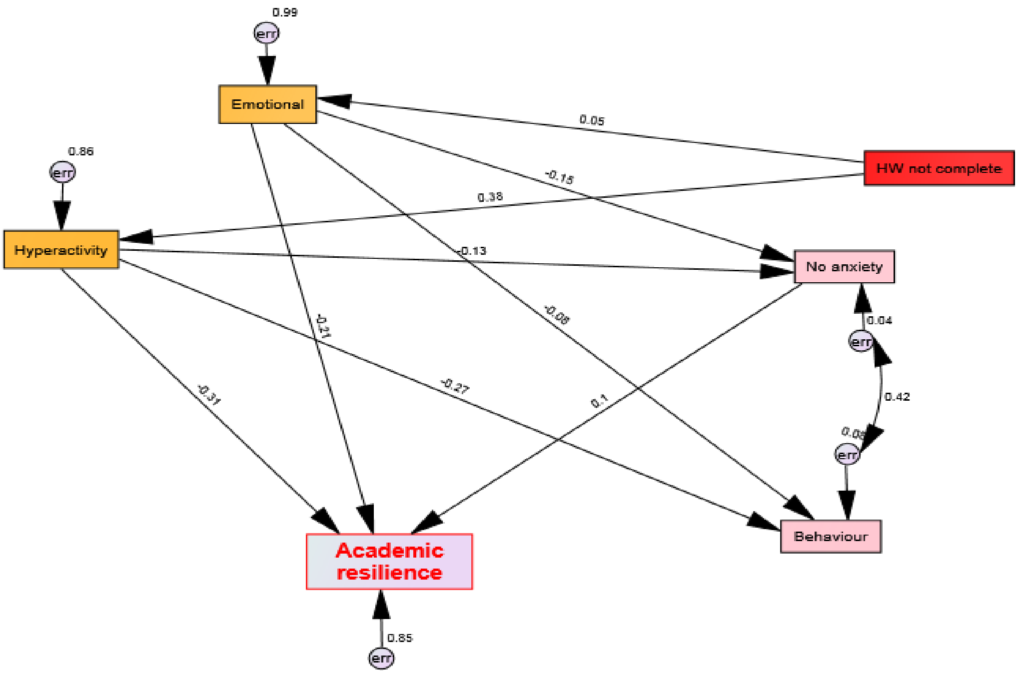

Figure 5.7: Final nested model of academic resilience – age nine (with standardised coefficients)

Table 5.3: Unstandardised coefficients, standardised coefficients, and significance levels for the nested model in Figure 5.7

Parameter estimate	Unstandardised (SE)	Standardised	*p*
Emotional symptoms ➔ resilience	-.210 (.040)	-.209	.000
Hyperactivity ➔ resilience	-.315 (.044)	-.308	.000
Freedom from anxiety ➔ resilience	.101 (.042)	.098	.018
Regularly having incomplete homework ➔ emotional symptoms	.198 (.089)	.053	.026
Regularly having incomplete homework ➔ Hyperactivity	1.386 (.088)	.377	.000
Emotional symptoms ➔ behavioural adjustment	-.076 (.024)	-.077	.001
Hyperactivity ➔ behavioural adjustment	-.268 (.024)	-.268	.000
Emotional symptoms ➔ freedom from anxiety	-.149 (.025)	-.151	.000
Hyperactivity ➔ freedom from anxiety	-.134 (.024)	-.134	.000
Behavioural adjustment WITH freedom from anxiety	.387 (.027)	.422	.000

5.3.4.4. Direct effects in the nested model of resilience – age nine

In the final nested model, greater levels of hyperactivity (standardized coefficient = -.134, $p < .05$) and emotional symptoms (standardized coefficient = -.151, $p < .05$) were related to greater levels of anxiety (or lower freedom from anxiety) when other factors in the model were accounted for. Similarly, greater levels of hyperactivity (standardized coefficient = -.268, $p < .05$) and emotional symptoms (standardized coefficient = -.077, $p < .05$) were also related to lower levels of behavioural adjustment, when other factors were accounted for. Regularly having incomplete homework was directly associated with greater emotional symptoms (standardized coefficient = .053, $p < .05$) and greater levels of hyperactivity (standardized coefficient = .377, $p < .05$). Also, greater levels of emotional symptoms (standardized coefficient = -.209, $p < .05$) and hyperactivity (standardized coefficient = -.308, $p < .05$) were directly associated with lower likelihood of resilience, while lower levels of anxiety (or greater freedom from anxiety) was associated with greater likelihood of resilience (standardized coefficient = .098, $p < .05$), when other factors were accounted for.

5.3.4.5. Variance explained in the nested model of resilience – age nine

R^2 estimates are provided for each dependent variable. As with the full model of resilience at age nine, R^2 estimates should be interpreted with caution as the model fit statistics are inconclusive. In the nested model, 4.2% of the variance in the child's freedom from anxiety self-concept is accounted for by emotional symptoms and hyperactivity, while 7.8% of the variance in behavioural adjustment is explained by these variables. Just 0.3% of the variance in emotional symptoms and 14.2% of the variance in hyperactivity is accounted for by frequency of having incomplete homework. Finally, 16.6% of the variance in resilience is accounted for by emotional symptoms, hyperactivity and freedom from anxiety.

5.4. Hypothesised model of resilience – age 13

Using the theoretical model as a framework, the variables that were identified in the logistic regression analyses as unique predictors of resilience at age 13 were arranged into the hypothesised model at age 13. Variables are colour coded to correspond with the colour of the construct they are intended to measure in the theoretical model (Figure 5.1). This model was constructed in such a way so as to resemble the theoretical model as closely as possible. The hypothesised model is presented in Figure 5.8.

Background variables

Three variables remained as significant predictors of resilience in the final logit model examining the effect of background variables on the probability of being classified as resilient (*proportion of income from welfare*, *highest level of education of parents* and *gender*) and are included in the hypothesised model. As all of these variables are measured directly, they are represented as measured variables in this model.

Relationships with family, teachers and peers

Four variables (*mother's level of demandingness; mother's level of responsiveness; conflict between the child and their secondary caregiver;* and *the child's level of disclosure to their primary caregiver*) remained significant predictors of resilience in the final logit model of resilience and the study child's relationship with family (see Table 4.21) and are included in the hypothesised model as indicators of the latent variable 'family environment'. Of the six variables that measured the study child's relationship with their teacher, two (the child is *told by a teacher that their work is good* and the child is *praised by their teacher for answering a question*; Table 4.22) significantly distinguished between resilience and vulnerability in the final logit model examining resilience and the study child's relationship with their teacher. These variables were included as measured variables in the hypothesised model. None of the variables that measured the child's relationship with their peers were significantly associated with resilience and therefore this construct is not measured in the hypothesised model of resilience at age 13.

Educational expectations and attitudes

Two variables significantly predicted resilience in the final logit models of resilience and educational expectations: *how far the child expects to go in education* and *how far the child's parents expect them to go in education* (Table 4.25 and Table 4.26). Both these variables are included as measured variables in the hypothesised model of resilience at age 13. One variable measuring, how much the study child likes school (Table 4.28), significantly distinguished between resilience and vulnerability and was included in the hypothesised model as a measured variable and a proxy for attitudes towards school.

Parental involvement

Three variables remained significantly associated with resilience in the final logit model of resilience and parental involvement in their child's education (Table 4.30). Two of these variables (*the primary caregiver has been to see the principal or another teacher about their child's behaviour or school performance* and *the primary caregiver attended a school concert, play or other event*) are included in the hypothesised model as proxies for parent communication with the school and one (*the frequency with which parents provide help with homework*) is included as a proxy for parental involvement in their child's education. All three variables are included in the hypothesised model as measured variables.

Child's engagement

Ten variables measured the study child's lifestyle (habits and routine) and, of these, four remained significantly associated with resilience in the final logit model of resilience and the child's lifestyle (Table 4.34). These four variables (*time spent reading for pleasure on a normal weekday, time spent playing video games on a normal weekday, child participates in sport without a coach* and *child participates in a homework club*) are indicators for the 'extra-curricular activities' latent variable in the hypothesised model. None of the six variables that measured the study child's engagement with family were found to be significantly associated with resilience and therefore no measures of family engagement contribute to the family environment construct in the hypothesised model. As at age nine, engagement with school was measured through a variable assessing the child's 'level of disengagement from school'; Table 4.35). This variable is formed by seven indicators (*the child was late for school, the child was in trouble for breaking rules, the child skipped classes, the child messed in class, the child had to do extra work as punishment, the child had to do detention* and *the child was suspended from school*) and is included as a latent variable in the hypothesised model (for clarity,the seven indicators of education disengagement are not included in Figure 5.8).

Personal attributes of the child

One variable measuring one aspect of the study child's self-concept (*intellectual self-concept*) significantly distinguished between resilience and vulnerability and was included in the hypothesised model as a measured variable (Table 4.38). Also, two variables measuring aspects of the study child's psychological adjustment (*emotional symptoms* and *hyperactivity*) were significantly associated with resilience (Table 4.39) and were included as measured variables as scales that measure just one factor require at least three variables to be properly identified (Raubenheimer, 2004), and so a latent variable for the child's psychological adjustment could not be created.

Relationships between selected variables

Applying the selected variables to the theoretical model, parents' education level was hypothesised to covary with the proportion of income the household receives from welfare. Parental expectations for their child's education is hypothesised to be directly predicted by parental education level and the proportion of income from welfare received. The relationship between parental education level and parent's expectations for how far their child will go in education is hypothesised to be mediated by whether the primary caregiver has been to see the principal or another teacher about their child's behaviour or school performance and whether the primary caregiver attended a school concert, play or other event, as is the relationship between the proportion of income received from welfare and parent's expectations for how far their child will go in education. It is also hypothesised that the path between parental education level and parental expectations (and between the proportion of income from welfare and parental expectations) is mediated by the frequency parents help their child with their homework.

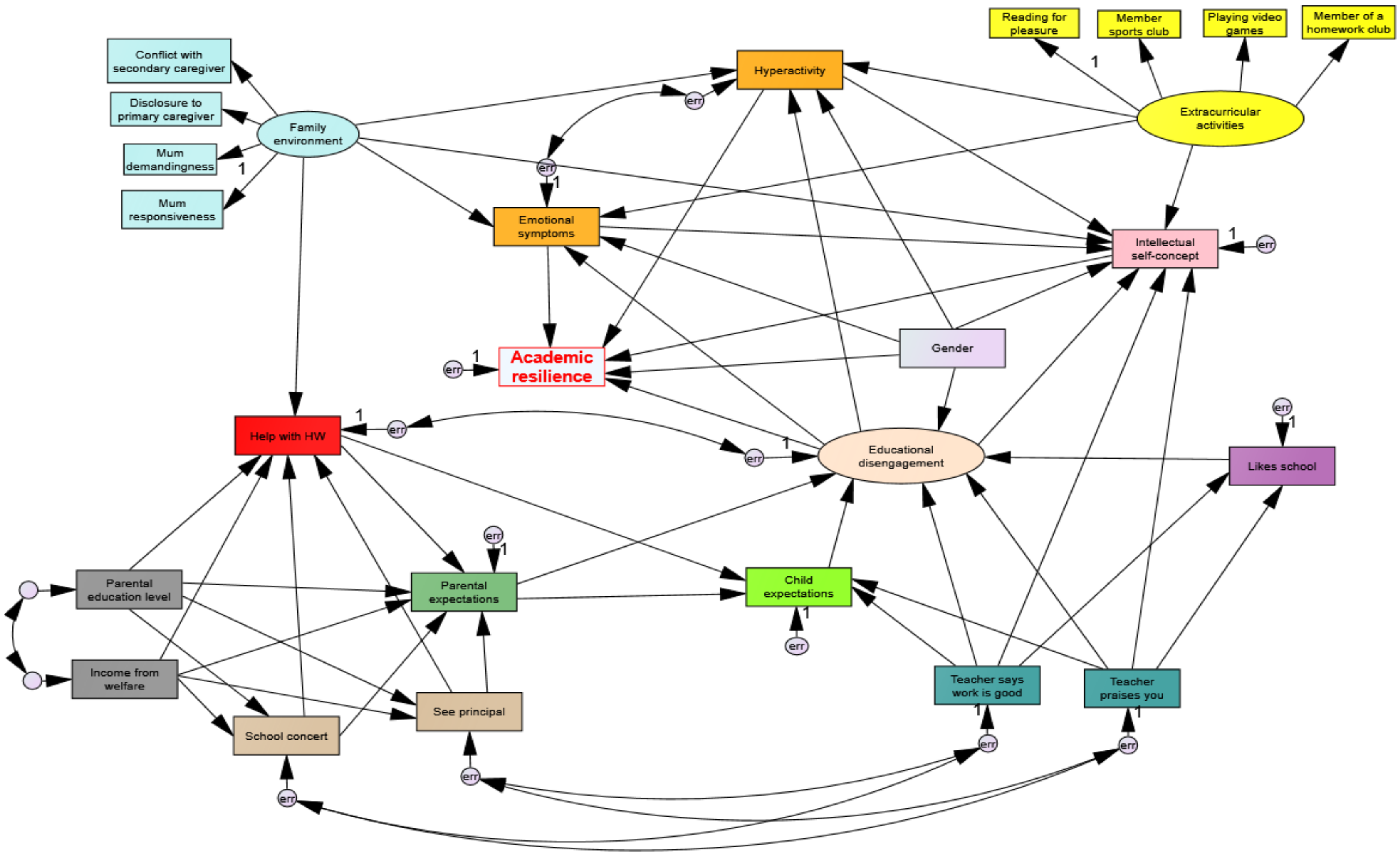

Figure 5.8: Hypothesised model of academic resilience – age 13
(for clarity, the seven indicators of educational disengagement are not included)

The frequency with which parents help their child with their homework is hypothesised to be predicted by family environment, whether the primary caregiver has been to see the principal or another teacher about their child's behaviour or school performance and whether the primary caregiver attended a school concert, play or other event. The child's expectations for how far they will go in education is hypothesised to be predicted by the frequency with which parents help their child with homework, parent's expectations for how far the study child will go in education, the frequency with which the child is told by a teacher that their work is good and the frequency with which the child is praised by their teacher. The frequency with which the child is praised by their teacher and told by a teacher that their work is good is predicted to covary with whether the primary caregiver has been to see the principal or another teacher about their child's behaviour or school performance and whether the primary caregiver attended a school concert, play or other event.

The study child's reported disengagement from school is hypothesised to covary with the frequency with which parents help their child with homework and also to be directly predicted by the parents' and the child's own expectations for how far they will go in education, the frequency with which the child is praised by their teacher and told by their teacher that their work is good and how much the study child likes school. How much the study child likes school is hypothesised to be predicted by the frequency with which the child is praised by their teacher and told by their teacher that their work is good.

The child's intellectual self-concept is hypothesised to be predicted by the frequency with which the child is praised by their teacher and is told by a teacher that their work is good. The child's intellectual self-concept is also hypothesised to be predicted by the study child's reported disengagement from school, the study child's family environment (a latent variable), engagement in extracurricular activities (a latent variable), and the study child's level of hyperactivity and emotional symptoms. Furthermore, the study child's level of hyperactivity and emotional symptoms are hypothesised to be predicted by engagement in extracurricular activities, educational disengagement and the child's family environment. Resilience is hypothesised to be directly predicted by the study child's level of emotional symptoms and hyperactivity, their intellectual self-concept and their reported disengagement with school.

The study child's level of emotional symptoms and hyperactivity, their intellectual self-concept and their reported disengagement from school are all hypothesised to be predicted by gender. Also, as previous studies have found mixed results regarding gender and resilience, it is hypothesised that resilience is directly predicted by gender.

5.4.1. Assumptions

The assumption of multivariate normality was evaluated for all continuous variables through IBM SPSS 23 using the Shapiro-Wilk test of normality and was found to be violated (i.e., $p<.05$; see Table 5.4). However, as Muthen (2001) has noted the WLSMV estimator is considered appropriate for non-normal data, it was deemed reasonable to proceed with analysis using the WLSMV estimator.

All variables were tested for multicollinearity in IBM SPSS 23 before being tested together in the model, with tolerance values of .10 or below and VIF values of 10 or above considered to indicate that the multicollinearity assumption was violated. Tolerance values were all at or above .523 and VIF values were all at or below 1.835, therefore the multicollinearity assumption was not violated (see Table A5.9). Tests of association using Pearson correlations were also performed between all variables and all correlation coefficients were below .432.

The dataset contains data for 1716 children. The rate of missing data for more resilient children was compared against all other children for each variable in the model and data were found to be missing at random (see Table A5.4).

Table 5.4: Results from the Shapiro-Wilks Test of Normality all scale variables included in the hypothesised model – age 13

Variable	Statistic	df	*p*
Parental education level	.888	869	.000
Proportion of income from welfare	.876	869	.000
Mother's demandingness	.983	869	.000
Mother's responsiveness	.941	869	.000
Conflict with secondary caregiver	.927	869	.000
Disclosure to primary caregiver	.916	869	.000
Frequency told by teacher that work is good	.837	869	.000
Frequency praised by teacher	.869	869	.000
Parental educational expectations	.804	869	.000
Child's educational expectations	.807	869	.000
How much child likes school	.874	869	.000
Frequency parents help with homework	.825	869	.000
Frequency child reads for pleasure	.726	869	.000
Frequency child plays video games	.676	869	.000
Child takes part in sports	.850	869	.000
Child takes part in homework club	.363	869	.000
Child was late for school	.650	869	.000
Child got in trouble for not following rules	.699	869	.000
Child skipped classes	.184	869	.000
Child messed in class	.794	869	.000
Child had to do extra work as punishment	.642	869	.000
Child had to do detention	.527	869	.000
Child was suspended from school	.133	869	.000
Child's level of emotional symptoms (parental report)	.881	869	.000
Child's level of hyperactivity (parental report)	.905	869	.000
Child's intellectual self-concept	.926	869	.000

5.4.2. Measurement model – age 13

Before the structural model was tested, Exploratory Factor Analysis followed by Confirmatory Factor Analysis, where relevant, was conducted to test the measurement model.

5.4.2.1. Exploratory Factor Analysis

Three latent variables (extra-curricular activities, family environment and disengagement from school), formed from questionnaire items, are specified in the hypothesised model. In order to validate the measurement scales formed from sets of questionnaire items, Confirmatory Factor Analysis was conducted and was preceded by Exploratory Factor Analysis. Exploratory Factor Analysis was conducted using IBM SPSS 23. Suitability for factor analysis was established using the Kaiser-Meyer-Oklin value (with values of .6 or above deemed acceptable) and by examining the correlation matrix (with it deemed necessary that at least some correlation coefficients of .3 or above should be present in order for factor analysis to proceed) (Pallant, 2006).

Four variables (*mothers' level of demandingness, mothers' level of responsiveness, disclosure to the primary caregiver* and *conflict with secondary caregiver*) are hypothesised to be indicators for the latent variable 'family environment' in the hypothesised model. Exploratory Factor Analysis, using principal components analysis, was conducted using these four variables. Prior to analysis the suitability of the data for factor analysis was assessed and given that the correlations between variables were all below .133 and the Kaiser-Meyer-Oklin value was .523, the data were deemed inappropriate for factor analysis. Therefore Confirmatory Factor Analyses was not conducted and it was decided to include the four indicator variables in the model as measured variables rather than as indicators of the latent variable 'family environment.'

Four variables (*time spent reading for pleasure on a normal weekday, time spent playing video games on a normal weekday, participation in sport without a coach* and *participation in a homework club*) are hypothesised to be indicators for the latent variable 'extra-curricular activities' in the hypothesised model. Exploratory Factor Analysis, using principal components analysis, was conducted using these four variables. Prior to analysis the suitability of the data for factor analysis was assessed. All correlations coefficients between variables were below .098 and the Kaiser-Meyer-Oklin value was .508, therefore the data were deemed inappropriate for factor analysis. Therefore Confirmatory Factor Analyses was not conducted and the four indicator variables are included in the model as measured variables rather than as indicators of the latent variable 'extra-curricular activities.'

Seven variables (*the child was late for school, the child was in trouble for breaking rules, the child skipped classes, the child messed in class, the child had to do extra work as punishment, the child had to do detention* and *the child was suspended from school*) were hypothesised to be indicators for the latent variable 'disengagement in school'. Principal components analysis revealed one component (disengagement from school) with eigenvalues exceeding 1 (see Table A3.21 in Appendix A), explaining 41.28% of the variance in the latent construct.

5.4.2.2. Confirmatory Factor Analysis (CFA)

To assess the adequacy of the measurement of the hypothesised latent variable *disengagement from school,* confirmatory factor analysis was performed, through M*plus* 6, for the seven variables measuring disengagement from school.

The hypothesised CFA model

The hypothesised model is presented in Figure 5.9. A one-factor model of disengagement from school, with seven indicators, is hypothesised.

Model estimation of disengagement from school

Maximum likelihood estimation was employed to estimate the model. The independence model that tests the hypothesis that all variables are uncorrelated was rejected, χ^2 (21, N = 1712) = 2815.686, p <.01, CFI = .00, RMSEA = .279. The hypothesised model (Figure 5.9) was tested next and while some of the model fit statistics indicated that the model was not a good fit of the data, χ^2 (14, N = 1712) = 219.386, p <.01, CFI = .927, RMSEA = .093, there was an improvement in fit between the independence model and the hypothesised model.

Post hoc model modifications were performed in an attempt to develop a better fitting model. A correlation between *the child got in trouble for breaking rules* and *the child messed in class* and between the *child skipped class* and *the child was suspended from school* were added and the final model was found to be a good fit of the data, χ^2 (12, N = 1712) = 56.838, p <.01, CFI = .960, RMSEA = .047. The final model is illustrated in Figure 5.10.

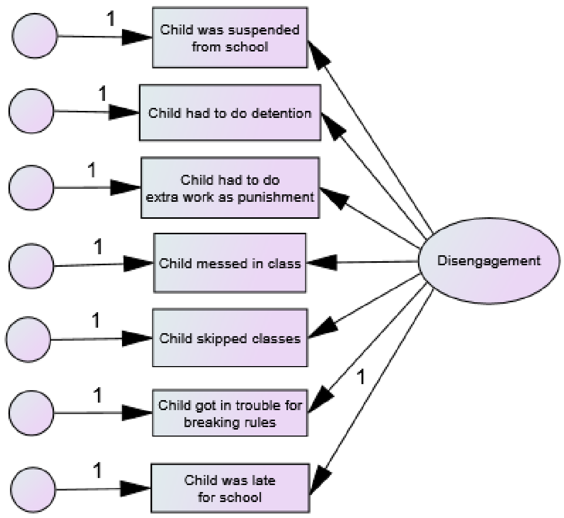

Figure 5.9: Hypothesised model of confirmatory factor analysis for the latent variable measuring disengagement from school – age 13

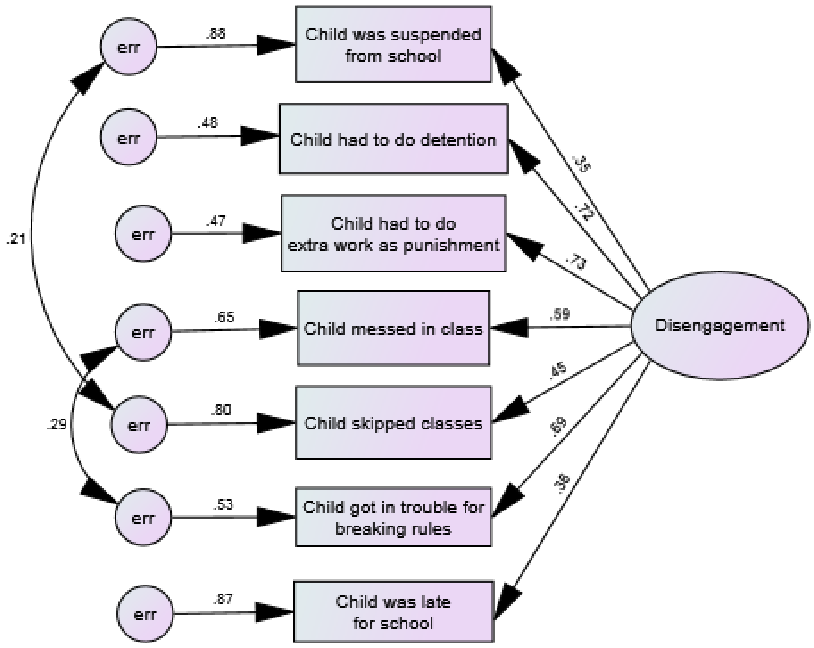

Figure 5.10: Final model of confirmatory factor analysis for the latent variable measuring disengagement from school (with standardised coefficients) – age 13

5.4.3. Structural model – age 13

5.4.3.1. <u>The hypothesised model</u>

The hypothesised model which is tested is comprised of the hypothesised model presented in Figure 5.8 but is altered slightly to take account of modifications that resulted from the Exploratory Factor Analysis and Confirmatory Factor Analysis (i.e., the variables measuring extra-curricular activities and family environment are presented as measured variables; and correlations were added between the variables '*the child messed in class'* and '*the child got into trouble for breaking rules'* and between the variables *'the child was suspended from school'* and *'the child skipped classes'*).

5.4.3.2. <u>Model estimation</u>

As at least one of the dependent variables in the hypothesised model was categorical, WLSMV estimation was used to fit the model using M*plus* 6.

The independence model that tests the hypothesis that all variables are uncorrelated was rejected, χ^2 (435, N = 1716) = 27830.562, p <.01, CFI = .000, RMSEA = .192. Next, the hypothesised model was tested and some support was found for the hypothesised model χ^2

(308, N = 911) = 923.946, p < .01, CFI = .844, RMSEA = .047. Post hoc modifications were performed in an attempt to develop a better fitting and more parsimonious model. As a first step, non-significant paths were removed one-at-a-time and DIFFTEST analysis was used to establish if removal of paths significantly altered the model. Where significant differences were found the paths remained in the model. The sequence of deleting non-significant relationships was decided in accordance with Bronfenbrenner's bio-ecological model of child development, i.e., variables perceived to be further from the child's immediate environment were deleted first. The sequence of removal of non-significant relationships is presented in Table A5.5. A number of modifications were suggested by M*plus* 6, however due to lack of theoretical relevance, no additional relationships were added to the model.

The final model is presented in Figure 5.11 and the standardised and unstandardised coefficients are presented in Table 5.5.

5.4.3.3. Model fit

The results of the final model, in terms of model fit, indicate there is at least partial support for the final model, χ^2 (341, N = 911) = 990.060, p <.01, CFI = .842, RMSEA = .046 (CI=.042, .049). The CFI value for the final model at age 13 is considered to be below the value required to indicate a good model (i.e. <.95), while the RMSEA value indicates that the final model fits the data well (i.e., it is below .06). As the RMSEA of the null model (.192) indicated that the null model was indeed a poor fit of the data, an RMSEA of .046 for the final model indicates that not only does this model fit the data well, but it is also a considerable improvement on the null model. The upper range of the confidence interval for the RMSEA is also below .06. Furthermore, dividing the chi-square figure by the degrees of freedom gives a value of 2.90 which is below the value considered to indicate a well-fitting model (i.e., 3). Therefore, as two out of the three model fit indices indicate a good fitting model, it is concluded that there is at least partial support for the final model of resilience at age 13.

As the relatively low CFI value associated with the final model may be due to the complexity of the model tests, it was decided to test a less complex nested model testing the relationships between just the variables directly associated with resilience in the hypothesised model.

Table 5.5: Unstandardised coefficients, standardised coefficients, and significance levels for model in Figure 5.11 (standard errors in parentheses)

Parameter estimate	Unstandardised (SE)	Standardised	*p*
Measurement Model			
Disengagement ➔ late for school	1.000 (.000)	.382	NA
Disengagement ➔ broke rules	1.721 (.149)	.622	.000
Disengagement ➔ skipped classes	.562 (.052)	.441	.000
Disengagement ➔ messed in class	1.701 (.168)	.542	.000
Disengagement ➔ extra work as punishment	1.743 (.161)	.632	.000
Disengagement ➔ detention	1.649 (.147)	.697	.000
Disengagement ➔ suspension	.282 (.028)	.306	.000
Covariance suspension and skipped classes	.080 (.010)	.305	.000
Covariance messed in class and broke the rules	.019 (.001)	.410	.000
Structural Model			
Parental education level ➔ Frequency parents help with homework	.032 (.016)	.063	.047
Parent has been to see principal about child's behaviour or school performance ➔ Frequency parents help with homework	.327 (.092)	.136	.000
Conflict with the secondary caregiver ➔ Frequency parents help with homework	.073 (.031)	.078	.020
Parental education level ➔ parental educational expectations	.312 (.033)	.318	.000
Parent has attended a school concert, play or other event ➔ parental educational expectations	5.567 (5.359)	.438	.299
Parent has been to see principal about child's behaviour or school performance ➔ parental educational expectations	-.544 (.165)	-.116	.000
Frequency parents help with homework➔ parental educational expectations	-.189 (.062)	-.097	.002
Parental educational expectations ➔ child educational expectations	.377 (.049)	.295	.000
Parental educational expectations ➔ disengagement	-.015 (.004)	-.124	.000
Teacher says work is good ➔ child expectations	1.020 (.156)	.275	.000
Teacher says work is good ➔ intellectual self-concept	.783 (.064)	.522	.000
Teacher says work is good ➔ disengagement	-.069 (.016)	-.202	.000
Teacher says work is good ➔ child likes school	.789 (.073)	.484	.000
Child likes school ➔ disengagement	-.041 (.007)	-.193	.000
Gender ➔ disengagement	.095 (.021)	.220	.000
Disengagement ➔ intellectual self-concept	-.753 (.128)	-.173	.000
Disengagement ➔ hyperactivity	.977 (.151)	.222	.000
Hyperactivity ➔ intellectual self-concept	-.071 (.030)	-.072	.019
Emotional symptoms ➔ intellectual self-concept	-.132 (.032)	-.134	.000
Participation in sport ➔ intellectual self-concept	.095 (.029)	.102	.001
Participation in sport ➔ emotional symptoms	-.070 (.031)	-.074	.022
Participation in homework club ➔ hyperactivity	.141 (.040)	.100	.000
Reading for pleasure ➔ intellectual self-concept	.001 (.000)	.116	.000
Playing video games ➔ intellectual self-concept	-.001 (.000)	-.096	.001
Playing video games ➔ hyperactivity	.001 (.000)	.087	.011
Disclosure to primary caregiver ➔ hyperactivity	-.085 (.032)	-.088	.008
Conflict with secondary caregiver ➔ hyperactivity	.226 (.030)	.239	.000
Conflict with secondary caregiver ➔ intellectual self-concept	-.068 (.030)	-.073	.022

Conflict with secondary caregiver ➔ emotional symptoms	.158 (.030)	.166	.000
Mother's responsiveness ➔ intellectual self-concept	.269 (.030)	.283	.000
Mother's demandingness ➔ intellectual self-concept	.096 (.029)	.101	.001
Gender ➔ intellectual self-concept	.205 (.065)	.109	.002
Gender ➔ emotional symptoms	-.210 (.073)	-.110	.004
Emotional symptoms ➔ resilience	-.148 (.068)	-.134	.030
Hyperactivity ➔ resilience	-.288 (.057)	-.261	.000
Intellectual self-concept ➔ resilience	.397 (.070)	.356	.000
Gender ➔ resilience	.377 (.130)	.180	.004
Covariance teacher says work is good and parent has attended a school concert, play or other event	.042 (.039)	.472	.288
Covariance teacher praises child and parent has attended a school concert, play or other event	.016 (.016)	.126	.336
Covariance teacher says work is good and parent has been to see principal about child's behaviour or school performance	-.045 (.013)	-.185	.001
Covariance teacher praises child and parent has been to see principal about child's behaviour or school performance	-.016 (.012)	-.046	.181
Covariance frequency parents help with homework and disengagement	-.004 (.006)	-.022	.503
Covariance emotional symptoms and hyperactivity	.206 (.026)	.256	.000
Covariance parental education level and Proportion of income from welfare	-.506 (.115)	-.152	.000

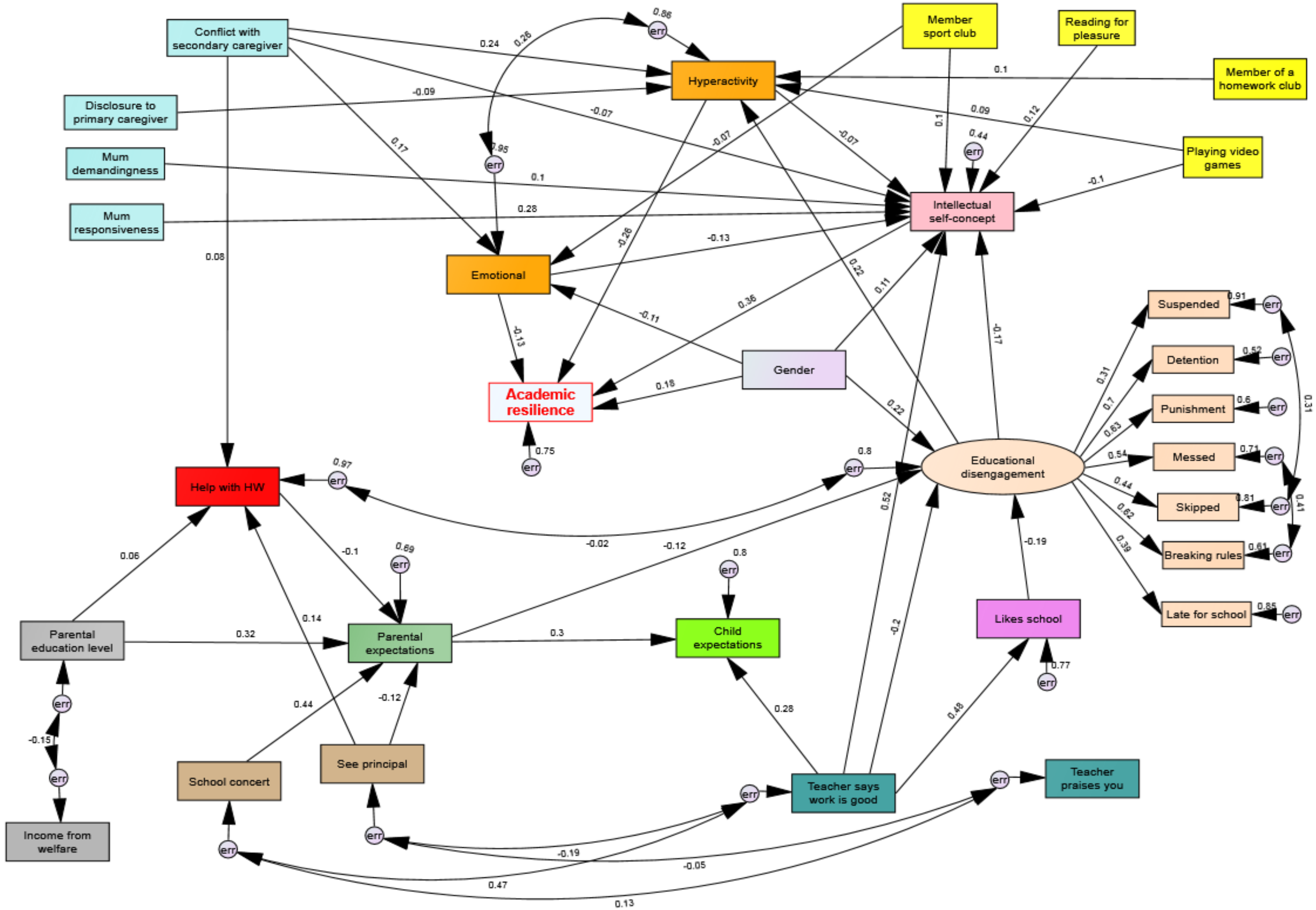

Figure 5.11: Final model of academic resilience – age 13 (with standardised coefficients)

5.4.3.4. Direct effects in the final model of resilience – age 13

This section presents a description of the direct paths that remained in the final model of resilience at 13 years old. All paths described are statistically significant unless otherwise stated. The direction and strength of individual paths that are described in this section are those when all other factors in the model are accounted for.

Higher levels of parental education (measured in years; standardized coefficient = .318, $p < .05$) and less time spent helping the study child with their homework (measured on a scale from 1 [never] to 5 [always/almost always]; standardized coefficient = -.097, $p < .05$) were associated with greater parental educational expectations (measured in years of education) for their child. Parental education level was associated with the frequency with which parents help their child with their homework, such that those with a higher level of education help their children more regularly (standardized coefficient = .063, $p < .05$). Parents who had attended a school concert, play or other event (binary) were also more likely to have higher educational expectations for their child, although this relationship was not statistically significant (standardized coefficient = .438, $p > .05$). On the other hand, parents who had met with the principal about their child's behaviour or school performance (binary) were significantly more likely to have lower educational expectations for their child (standardized coefficient = -.116, $p < .05$).

Children whose parents had been to see the principal about their child's behaviour or school performance also received help with homework more frequently (standardized coefficient =.136, $p < .05$), as did those who reported greater levels of conflict with their secondary caregiver (centred; standardized coefficient =.078, $p < .05$).

Children whose parents had higher educational expectations for them also had higher educational expectations for themselves (measured in years of education; standardized coefficient = .295, $p < .05$) as did children who were told more frequently by their teacher that their work is good (standardized coefficient = .275 $p < .05$). Children's reported disengagement from school was also significantly associated with parents educational expectations for their child, such that higher parental expectations were related to lower levels of disengagement (standardized coefficient = -.124, $p < .05$).

Gender was also associated with disengagement from school such that boys were significantly more likely to report greater disengagement from school (standardized coefficient = .220, $p < .05$). Children who are told that their work is good by their teacher more frequently were also less likely to be disengaged from school (standardized coefficient = -.202, $p < .05$) as were those who liked school (measured on a scale of 1 ['I hate it'] to 5 ['I like it very much']) to a greater extent (standardized coefficient = -.193, $p < .05$). Children whose teachers' said their work was good more frequently were more likely to report liking school (standardized coefficient = .484, $p < .05$) and also more likely to have a positive intellectual self-concept (centred; standardized coefficient = .522, $p < .05$). Disengagement from school was also directly associated with intellectual self-concept, such that those who reported greater levels of disengagement were more likely to have lower levels of intellectual self-concept (standardized coefficient = -.173, $p < .05$).

Disengagement was directly related to hyperactivity, such that children who reported greater levels of disengagement were more likely to report greater levels of hyperactivity (centred; standardized coefficient = .222, $p < .05$). Hyperactivity and emotional symptoms were negatively associated with intellectual self-concept (both variables are centred; standardized coefficient = -.072, $p < .05$; standardized coefficient = -.134, $p < .05$, respectively), as were playing video games more frequently (measured in minutes; standardized coefficient = -.096, $p < .05$) and a greater level of conflict with the secondary caregiver (centred; standardized coefficient = -.073, $p < .05$). On the other hand, reading for pleasure (measured in minutes; standardized coefficient = .116, $p < .05$) and participation in sport (measured on a scale of 1 [never] to 4 [most days a week]; standardized coefficient = .102, $p < .05$) were positively associated with intellectual self-concept (centred). Similarly, children whose mothers were more responsive (centred) and more demanding (centred) were also more likely to have greater levels of intellectual self-concept (standardized coefficient = .283, $p < .05$; standardized coefficient = .101, $p < .05$, respectively).

Participation in sport was negatively associated with emotional symptoms (standardized coefficient = -.074, $p < .05$), such that children who participated in sport more regularly tended to have lower levels of emotional symptoms, while, children who reported a greater level of conflict with their secondary caregiver were more likely to have greater levels of emotional symptoms (standardized coefficient = .166, $p < .05$). Greater levels of hyperactivity were predicted by participation in a homework club (standardized coefficient = .100, $p < .05$), playing video games (standardized coefficient = .087, $p < .05$) and conflict with the secondary caregiver (standardized coefficient = .239, $p < .05$), while greater levels of disclosure to the primary caregiver (centred) was associated with lower levels of hyperactivity (standardized coefficient = -.088, $p < .05$).

Gender was directly related to intellectual self-concept (standardized coefficient = .109, $p < .05$) and emotional symptoms (standardized coefficient = -.110, $p < .05$), such that boys were more likely to have greater levels of intellectual self-concept but lower levels of emotional symptoms. Finally, resilience was associated with being male (standardized coefficient = .180, $p < .05$), having lower levels of emotional symptoms (standardized coefficient = -.134, $p < .05$), lower levels of hyperactivity (standardized coefficient = -.261, $p < .05$) and a more positive intellectual self-concept (standardized coefficient = .356, $p < .05$).

5.4.3.5. Indirect effects in the final model of resilience – age 13

As at age nine, indirect effects were tested at age 13 using bias-corrected bootstrapping, which provides more robust estimates of standard errors and confidence intervals.

Six partially indirect relationships were hypothesised in the model:

1. The relationship between parental education level and parental expectations for their child is mediated by the frequency of parents helping with homework
2. The relationship between income received from welfare and parental expectations for their child is mediated by the frequency of parents helping with homework
3. The relationship between parental education level and parental expectations for their child is also mediated by parental attendance at a school concert, play, or other event.
4. The relationship between parental education level and parental expectations for their child is also mediated by whether parents had been to see the principal about their child's behaviour or school performance.
5. The relationship between income received from welfare and parental expectations for their child is also mediated by parental attendance at a school concert, play, or other event.

6. The relationship between income received from welfare and parental expectations for their child is also mediated by whether parents had been to see the principal about their child's behaviour or school performance.

Due to a lack of significant direct relationships, only the first hypothesised partially indirect relationship was tested in the final model. The path from parental education level to parental expectations was hypothesised to be mediated by the frequency with which parents help their child with their homework but was found not to be statistically significant (standardized coefficient = -.007 [CI: -.016, .002], $p > .05$) indicating that the relationship between parents' level of education and their expectations for their child is not explained by the frequency with which they help their child with their homework at age 13.

5.4.3.6. Variance explained in the final model of resilience – age 13

Estimates of variance explained are not provided for the whole model in structural equation modelling. Instead, R^2 estimates are provided for each dependent variable. As with the full model of resilience at age nine, R^2 estimates should be interpreted with caution as not all the model fit statistics indicate that the model fits the data well.

The latent variable 'disengagement from school' explained 14.6% of the variance in the child's report of being late for school, 38.7% of the variance in the child's report of getting in trouble for breaking rules, 19.5% of the variance in the child's report of skipping class, 29.3% of the variance in the child's report of messing in class, 40.0% of the variance in the child's report of having to do extra work as punishment, 48.5% of the variance the child's report of having to do detention and 9.4% of the variability in the child's report of being suspended from school. Just 2.9% of the variance in the frequency of parent's helping with homework was accounted for by parental education level and conflict with the secondary caregiver.

Almost a third (31.5%) of the variance in parental expectations was accounted for by parental education level; attendance by parent at school concert, play or other event; whether a parent has been to see the principal about their child's behaviour or school performance; and the frequency with which parents help their child with homework. About a fifth (20.5%) of the variance in child's expectations was accounted for by their parent's expectations for educational attainment and also by the frequency with which their teacher tells them that their work is good. Also, 23.5% of the variance in the child's reports of liking school is accounted for by the frequency with which their teacher tells them that their work is good.

Just 5.0% of the variance in emotional symptoms was accounted for by participation in sport, conflict with the secondary caregiver and gender; while 14.7% of the variance in hyperactivity was accounted for by participation in a homework club, playing video games, disengagement from school, level of disclosure to the primary caregiver and conflict with the secondary caregiver. Over half (56.1%) of the variance in intellectual self-concept was accounted for by gender, playing video games, reading for pleasure, participation in sports, hyperactivity, emotional symptoms, conflict with the secondary caregiver, the mother's level of demandingness and the mother's level of responsiveness. Finally, 32.5% of the variance in the latent variable underlying the observed variable measuring resilience was accounted for by gender, emotional symptoms, hyperactivity and intellectual self-concept.

5.4.4. Nested model – age 13

As stated earlier, the relatively low CFI value associated with the final model of resilience may be due to the complexity of the model tested. Therefore, it was decided to test a less complex, nested model, testing the relationships between just the variables directly associated with resilience in the hypothesised model.

5.4.4.1. The hypothesised nested model – age 13

The hypothesised nested model is comprised of the variables that were hypothesised to be directly related to resilience in the full hypothesised model, and is presented in Figure 5.12.

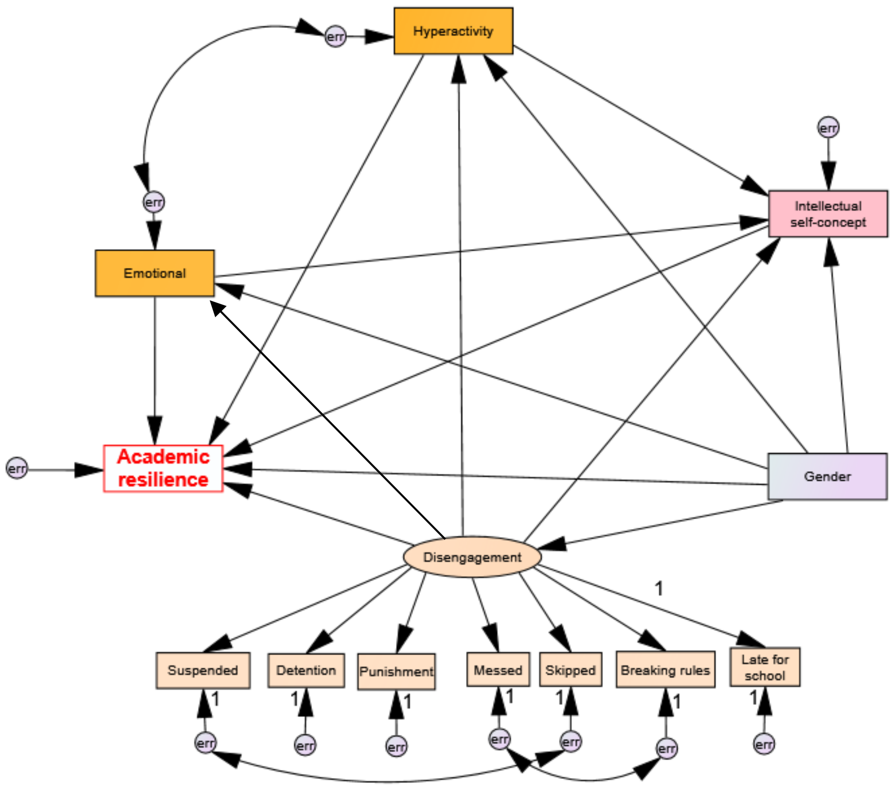

Figure 5.12: Hypothesised nested model of academic resilience – age 13

5.4.4.2. Nested model estimation – age 13

As with the full models at nine and 13 years old, WLSMV estimation was used to fit the nested model at 13 years old using M*plus* 6. The independence model, that all the variables were uncorrelated was rejected, χ^2 (66, N = 1716) = 5138.826, p < .01, CFI = .000 RMSEA = .212. Next the final model was tested and was found to be an improvement on the null model and to be a good fit of the data, χ^2 (42, N = 1716) = 165.841, p < .01, CFI = .976, RMSEA = .041. Post hoc modifications were performed in an attempt to develop a more parsimonious model. Non-significant paths were removed one-at-a-time and DIFFTEST analysis was used to establish if removal of paths significantly altered the model. Where significant differences were found, or where removal resulted in a poorer fitting model, the paths remained in the model. The sequence of deleting non-significant relationships was decided in accordance with Bronfenbrenners' bio-ecological model of child development, i.e., variables perceived to be further from the child's immediate environment were deleted first. The sequence of removal of non-significant relationships is presented in Table A5.16. No additional paths were added to the nested model.

5.4.4.3. Model fit for the nested model – age 13

The fit statistics of the final nested model show that the removal of non-significant paths improved the model fit, χ^2 (44, N = 1716) = 143.508, p < .01, CFI = .981, RMSEA = .036 (CI RMSEA: .030, .043) and the CFI and RMSEA figures indicate that the final nested model is a good fit to the data. Dividing the chi-square figure by the degrees of freedom gives a value of 3.26 which is just above the value considered to indicate a well-fitting model (i.e., 3). When the model fit statistics are considered together, it is concluded that there is at least partial support for the final nested model at age 13 (i.e., two out of the three model fit indices indicate that the model fits the data well). The final nested model is presented in Figure 5.13 and the standardised and unstandardized coefficients are presented in Table 5.6.

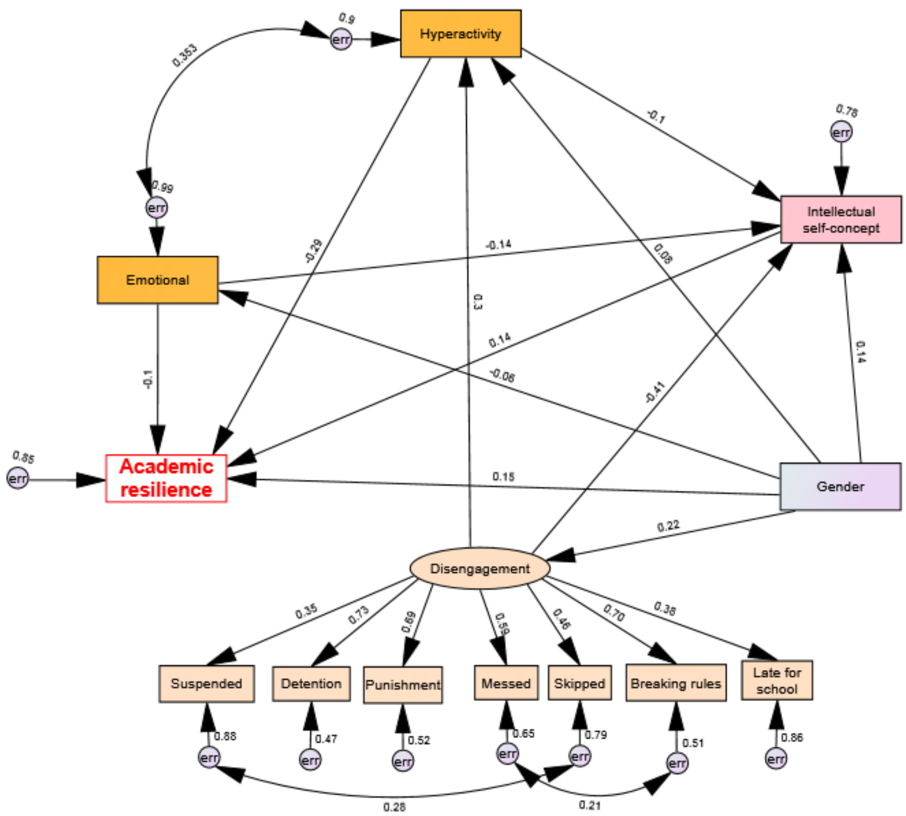

Figure 5.13: Final nested model of academic resilience – age 13 (with standardised coefficients)

Table 5.6: Unstandardised coefficients, standardised coefficients, and significance levels for the nested model in Figure 5.13

Parameter estimate	Unstandardised (SE	Standardised	*p*
Measurement model			
Disengagement → late for school	1.000* (.000)	.379	NA
Disengagement → broke rules	2.027 (.131)	.702	.000
Disengagement → skipped classes	.626 (.043)	.455	.000
Disengagement → messed in class	1.861 (.125)	.591	.000
Disengagement → extra work as punishment	1.951 (.141)	.693	.000
Disengagement → detention	1.804 (.129)	.729	.000
Disengagement → suspension	.383 (.029)	.351	.000
Covariance suspension and skipped classes	.075 (.007)	.280	.000
Covariance messed in class and broke the rules	.014 (.001)	.211	.000
Structural model			
Gender → disengagement	.100 (.014)	.220	.000
Gender → emotional symptoms	-.116 (.049)	-.058	.017
Gender → hyperactivity	.150 (.047)	.075	.002
Gender → intellectual self-concept	.283 (.045)	.141	.000
Disengagement → hyperactivity	1.305 (.136)	.297	.000
Disengagement → intellectual self-concept	-1.795 (.149)	-.408	.000
Emotional symptoms → intellectual self-concept	--.142 (.024)	-.142	.000
Hyperactivity → intellectual self-concept	-.100 (.026)	-.100	.000
Emotional symptoms → resilience	-.100 (.048)	-.099	.039
Hyperactivity → resilience	-.288 (.045)	-.285	.000
Intellectual self-concept → resilience	.138 (.048)	.137	.004
Gender → resilience	.304 (.080)	.150	.000
Covariance emotional symptoms and hyperactivity	.333 (.025)	.353	.000

Note: * the unstandardised coefficient for the first indicator for latent variables is set to 1.

5.4.4.4. Direct Effects in the nested model of resilience – age 13

In the final nested model, gender was significantly related to disengagement from school (standardized coefficient = .220, $p < .05$), emotional symptoms (standardized coefficient = -.058, $p < .05$), hyperactivity (standardized coefficient = .075, $p < .05$) and intellectual self-concept (standardized coefficient = .141, $p < .05$), such that being male is associated with greater levels of disengagement, hyperactivity and intellectual self-concept but lower levels of emotional symptoms, when the other factors in the model were accounted for.

Greater levels of disengagement were directly associated with greater levels of hyperactivity (standardized coefficient = .297, $p < .05$) and lower levels of intellectual self-concept (standardized coefficient = -.408, $p < .05$), when other factors were accounted for. Emotional symptoms were negatively associated with intellectual self-concept (standardized coefficient = -.142, $p < .05$), as was hyperactivity (standardized coefficient = -.100, $p < .05$), indicating that children who have greater levels of emotional symptoms and hyperactivity are more likely to have lower levels of intellectual self-concept.

Also, greater levels of emotional symptoms (standardized coefficient = -.099, $p < .05$) and hyperactivity (standardized coefficient = -.285, $p < .05$) were associated with lower likelihood of resilience, while greater levels of intellectual self-concept was associated with a greater likelihood of resilience (standardized coefficient = .137, $p < .05$), when other factors were accounted for. Gender was also associated with resilience (standardized coefficient = .150, $p < .05$), with boys significantly more likely to be classified as resilient than girls, when the other factors in the model are accounted for.

5.4.4.5. Variance explained in the nested model of resilience – age 13

R^2 estimates are provided for each dependent variable in the nested model. The latent variable 'disengagement from school' explained 14.4% of the variance in the child's report of being late for school, 49.3% of the variance in the child's report of getting in trouble for breaking rules, 20.7% of the variance in the child's report of skipping class, 34.9% of the variance in the child's report of messing in class, 48.0% of the variance in the child's report of having to do extra work as punishment, 53.2% of the variance the child's report of having to do detention and 12.3% of the variability the child's report of being suspended from school. Just 0.3% of the variance in emotional symptoms was accounted for by gender, while 10.3% of the variance in hyperactivity was accounted for by gender and educational disengagement and 22.3% of the variance in intellectual self-concept was accounted for by emotional symptoms, hyperactivity, disengagement from school and gender. Finally, 16.7% of the variance in resilience was accounted for by emotional symptoms, hyperactivity, intellectual self-concept and gender.

5.4.5. Gender as a moderating variable – age 13

Gender was found to be significantly associated with resilience, as well as being significantly associated with emotionality, intellectual self-concept, hyperactivity (in the nested model only) and educational disengagement (each of which, with the exception of disengagement, were also significantly associated with resilience) in the final model and nested model of resilience at age 13. To further explore the relationship between gender and resilience, it was decided to examine if gender moderates the relationship between resilience and emotionality; the relationship between resilience and intellectual self-concept; and the relationship between resilience and hyperactivity (i.e., the relationship between, for example, emotionality and resilience, will differ by gender).

Three models were hypothesised, each with resilience as outcome and either emotional symptoms, intellectual self-concept or hyperactivity as predictor. In each model, gender is hypothesised to moderate the relationship between the predictor variable and resilience. In each model it is hypothesised that there is a direct path between the predictor variable and resilience; between gender and resilience; and between the interaction among the moderated and moderating variables (i.e., the product of predictor variable and gender) and resilience (see figures 5.14 to 5.16 below). As there are paths between every pair of variables in each model (i.e., the models are saturated) model fit statistics cannot be evaluated, therefore only the significance level of the indirect effect will be assessed (Muthen, 2008).

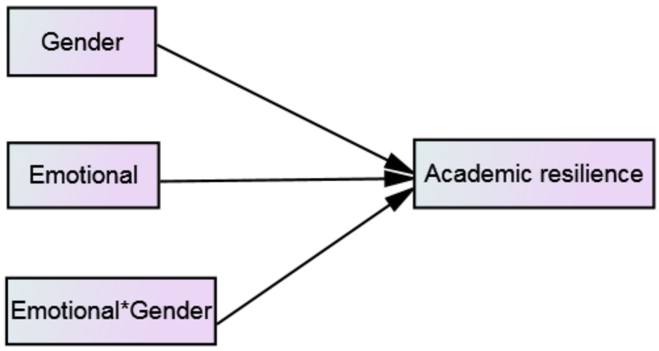

Figure 5.14: Model 1: hypothesised model of emotionality, academic resilience and gender - age 13

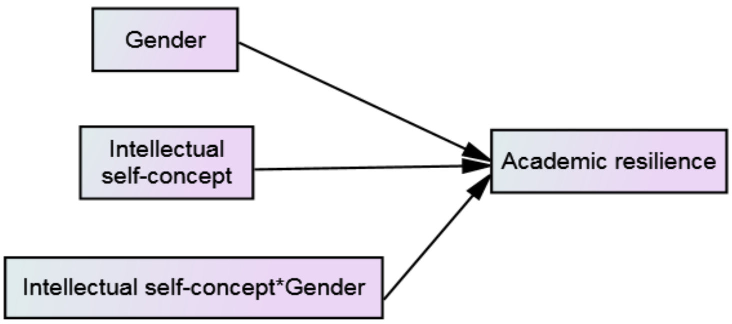

Figure 5.15: Model 2: hypothesised model of intellectual self-concept, academic resilience and gender – age 13

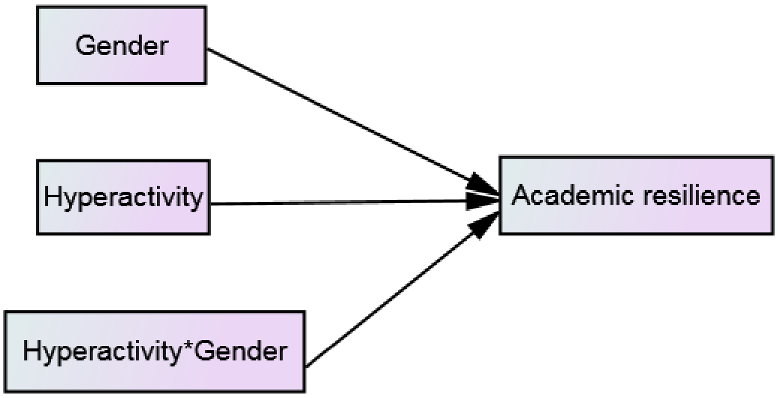

Figure 5.16: Model 2: hypothesised model of hyperactivity, academic resilience and gender – age 13

The standardised and unstandardised coefficients for each model are presented in Table 5.7. In all models, the interaction between gender and the predictor variable was not statistically significant. This indicates that gender does not act as a moderator between emotionality and resilience; between intellectual self-concept and resilience, nor between hyperactivity and resilience.

Table 5.7: Unstandardised coefficients, standardised coefficients, and significance levels for models 1 to 3 presented in figures 5.14 to 5.16

Parameter estimate	Unstandardised (SE)	Standardised	*p*
Model 1 – gender, emotionality and resilience			
Gender → resilience	.227 (.083)	.109	.006
Emotionality → resilience	-.237 (.060)	-.229	.000
Product of gender and emotionality → resilience	.001(.089)	.001	.991
Model 2 – gender, intellectual self-concept and resilience			
Gender → resilience	.228 (.083)	.110	.006
Intellectual self-concept → resilience	.205 (.058)	.199	.000
Product of gender and intellectual self-concept → resilience	.008 (.090)	.005	.927
Model 3 – gender, hyperactivity and resilience			
Gender → resilience	.341 (.088)	.159	.000
Hyperactivity → resilience	-.367 (.072)	-.343	.000
Product of gender and hyperactivity → resilience	.003 (.094)	.002	.974

The finding that boys are more likely to be classified as resilient at age 13 may be related to differences in performance on the tests of achievement between boys and girls (Table 5.8). Boys were found to significantly outperform girls on the tests of verbal reasoning (t=10.809, df=7097, p<.05) and numerical ability (t=11.434, df=7097, p<.05) at age 13. When gender differences in performance among those with access to a medical card were examined, it was noted that the difference between boys and girls became wider for verbal reasoning (from 5.86 points to 7.19 points) but narrower for numerical ability (from 6.23 points to 5.24 points). Boys were also found to significantly outperform girls in mathematics at age nine (t=7.312; df=8415; p<.05), however the difference was much narrower than at age 13 (3.4 compared to 6.2 score points). On the other hand, there was no significant difference between reading scores of boys and girls at nine-years-old (t=1.392, df=8338, p>.05). These findings indicate that differences in terms of academic achievement between boys and girls in this sample become greater as children move from middle childhood to early adolescence.

Table 5.8: Mean percent correct scores of boys and girls on the reading and mathematics tests at age nine, and the verbal reasoning and numerical ability tests – age 13

	Nine years old				13 years old			
	Reading		Mathematics		Verbal reasoning		Numerical ability	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Male	67.89	.34	55.34	.34	63.12	.36	53.42	.39
Female	67.23	.34	51.93	.32	57.26	.41	47.19	.38

5.5. How do the final models of resilience compare to the theoretical model?

This section describes how the two final models of resilience at nine and 13 years old compare to the theoretical model. The direction and strength of individual paths that are described in this section are when all other factors in the model are accounted for. As the final full models of resilience at nine and 13 years old differ somewhat in terms of the variables and pathways included, comparisons cannot be made between these two models in terms of the strength of relationships.

The theoretical model of resilience indicates that parental occupation, education level and income are directly related to parent's educational expectations for their child and that these relationships are mediated through parents' involvement in their child's education and also through the parents' communication with their child's school. There was some support for these paths in the models of resilience at nine and 13 years old. At age nine, parental education level and social class (as measured by parental occupation) were included in the hypothesised model. While parental education level was significantly related to parental expectations in the final model (i.e., parents with a higher level of education had higher expectations for their child), social class was not.

On the other hand, both parental education level and social class were associated with the frequency with which parents help their child with homework at age nine, but in different directions. Children whose parents have a higher level of education received help with homework more often, while those who had a higher household social class received help less often. This is an interesting finding considering that there was a positive (although moderate) correlation between parental education and social class in the final model at age nine and suggests that there may be some interaction between parental education level and social class (as measured by occupation) that is creating a differential outcome in terms of the frequency of helping with homework. While both parental education level and the frequency with which parents help with homework were associated with parental expectations, the relationship between parental education level and expectations was not found to be mediated by the frequency with which they help their child with homework at age nine. Also, due to a lack of variance in the variable measuring whether parents attend parent-teacher meetings, the relationship between parent communication with their child's school, parental education and parental expectations could not be measured at age nine.

Parental education level was also directly, and positively, related to parental expectations for their child and the frequency with which they help their child with homework at age 13. However, while the frequency with which parents help with homework was negatively associated with parent's expectations, the relationship between parental education level and expectations was not found to be mediated by the frequency with which parents help with homework at age 13. Parent communication with their child's school was also directly associated with parental expectations at age 13. Children whose parents had been to see the principal or another teacher about their child's behaviour or school performance tended to have lower expectations for their child, while those whose parents attended a school concert, play or other event tended to have higher expectations for their child. There was no direct relationship between parental education level and their communication with their child's school at age 13. Parental communication with their child's school was hypothesised to be directly related to involvement in their child's education in the theoretical model, and this was supported in the final model at age 13. Parents who had been to see the principal about their behaviour or performance tended to help their children with their homework more frequently.

In the theoretical model, parents' expectations for their child's education was hypothesised to be directly related to the child's own expectations and the child's engagement in education (measured as disengagement in the hypothesised models). While no measure of child's expectations was included at age nine, parent's expectations were directly and negatively related to the child's disengagement in education. At age 13, parental expectations were positively related to the child's own expectations of their educational attainment and negatively related to the child's level of disengagement in school. The frequency with which parents help their child with their homework covaried with the child's disengagement in school at age 13 (as hypothesised in the theoretical model), but not at age nine. Parents' involvement in their child's education was hypothesised to be directly related to the child's own educational expectations but this relationship was not supported by either model. The child's own expectations were hypothesised to be directly related to their engagement in education in the theoretical model but this relationship was not supported in the final model of resilience at age 13 (and not measured at age nine).

Teacher's expectation for the study child was hypothesised to be directly related to the child's level of engagement in school, the child's own educational expectations and their self-concept, and to covary with the parent's expectation for the study child. Teacher expectations were not measured at age 13, however each of these relationships (with the exception of that including the child's own expectations) were supported in the final model at age nine. Children whose teachers rated their school performance more favourably tended to have lower levels of disengagement in school and greater freedom from anxiety and behavioural adjustment at age nine.

A positive relationship with a teacher was also hypothesised to be directly related to the child's attitude towards school, their self-concept, their engagement in education, the child's expectations and their teacher's expectations in the theoretical model. A measure of the child's relationship with their teacher was not included in the model at age nine. At age 13, the child's relationship with their teacher was measured by how often the teacher says their work is good and how often they are praised by their teacher. Children whose teachers told them their work is good more frequently tended to have higher expectations, a more positive intellectual self-concept, to report liking school more often and lower levels of disengagement with school. The frequency with which a teacher told the child their work was good and praised the child covaried with the parents' communication with their child's school (measured by whether they had attended a school, play, concert or other event and whether they had been to see the principal about the child's behaviour or performance), as hypothesised by the theoretical model.

The child's relationship with their peers was hypothesised to be directly related to their attitude towards school, their engagement in school, their psychological adjustment and self-concept. None of the variables measuring the child's relationship with their peers were significantly associated with resilience at age 13 and therefore not included in the hypothesised model at age 13. At age nine, the child's reports of whether they talk to their friends about their problems were unrelated to all other variables in the model, while more time spent with friends was associated with liking school less frequently and below average emotional symptoms (although the standardised estimates for both relationships are small, indicating that these are not strong relationships). Having a positive attitude towards school was hypothesised to be directly related to the child's engagement in education and this relationship was supported in the model of resilience at 13 years old only. Children who reported liking school more often were less likely to be disengaged with school.

In the theoretical model, children's engagement in school was hypothesised to be directly related to their psychological adjustment, self-concept and resilience and there was support for some of these relationships in the final models, although different patterns emerged at each age level. Specifically, the frequency of having incomplete homework at age nine was positively associated with hyperactivity and negatively associated with emotional symptoms and resilience (although the frequency of having incomplete homework was not associated with resilience in the nested model at age nine, suggesting that engagement in education is only directly related to resilience when other variables are accounted for at age nine). Disengagement was positively associated with hyperactivity at age 13, but was negatively associated with intellectual self-concept and was not directly related to resilience.

Engagement in extracurricular activities was hypothesised to be directly related to both psychological adjustment and self-concept in the theoretical model and these relationships were supported in the models at both age levels. Specifically, at age nine, more frequent reading for pleasure was negatively associated with hyperactivity but positively associated with behavioural adjustment. Also at age nine, participating in a homework club was positively associated with hyperactivity, while there was a negative association between engagement in cultural activities and hyperactivity. Participation in sport was associated with greater freedom from anxiety at age nine. At age 13, participation in sport was associated with lower levels of emotional symptoms and a more positive intellectual self-concept. More frequent reading for pleasure was also associated with a more positive intellectual self-concept and participating in a homework club was related to greater levels of hyperactivity. Playing video games was associated with greater levels of hyperactivity and lower levels of intellectual self-concept.

In the theoretical model, the child's family environment was also hypothesised to be directly related to the child's psychological adjustment and self-concept, as well as their parent's involvement in their education. The variables measuring family environment differed at nine and 13 years old and therefore the relationships between these variables and psychological adjustment, self-concept, engagement in education and their parents involvement in their education also differed. At age nine, children who reported that they talk with their parents more frequently tended to have greater levels of hyperactivity, while greater levels of dependence on the primary caregiver was associated with greater levels of emotional symptoms. Greater levels of conflict was also associated with greater levels of emotional symptoms and hyperactivity, and lower levels of behavioural adjustment. Mothers' responsiveness was positively associated with the child's behavioural adjustment and their freedom from anxiety. Although included in the hypothesised model, whether the child has a say in family decisions, gets along with their siblings and talks to their father about their problems were not significantly associated with any other variables. Only the child's level of dependence on the primary caregiver was significantly associated with the frequency with which parents help their child with their homework at age nine, such that those who showed greater dependence received more help with their homework.

At age 13, children who reported greater levels of conflict with their secondary caregiver were more likely to have greater levels of hyperactivity and emotional symptoms and lower levels of intellectual self-concept. These children were also more likely to receive help with their homework from their parents. Greater levels of disclosure to the primary caregiver was associated with lower levels of hyperactivity, while greater levels of demandingness and responsiveness from the mother was associated with a more positive intellectual self-concept.

Children's psychological adjustment was hypothesised to be directly related to their self-concept, and both psychological adjustment and self-concept were hypothesised to be directly related to resilience in the theoretical model. At age nine, greater levels of hyperactivity were associated with lower levels of behavioural adjustment (and lower levels of freedom from anxiety in the nested model at age nine), while lower levels of emotional symptoms were associated with greater freedom from anxiety (and greater behavioural adjustment in the nested model at age nine). Lower levels of emotional symptoms was associated with resilience at age nine. Although not associated with resilience in the final model, lower levels of hyperactivity and greater freedom from anxiety were associated with resilience in the nested model of resilience at age nine. Disengagement with education was also associated with resilience in the full model at age nine (but not in the final nested model) suggesting that the relationship between hyperactivity and resilience may be partially explained by disengagement (or vice versa).

In both the final full model and the nested model of resilience at age 13, lower levels of hyperactivity and emotional symptoms were associated with greater levels of intellectual self-concept and resilience, while greater levels of intellectual self-concept were also associated with resilience. Gender was hypothesised to be associated with psychological adjustment, self-concept, engagement in education and resilience in the theoretical model. As gender was only a significant predictor of resilience at age 13, it was not included in the hypothesised model at age nine. At age 13 however, boys were more likely to have greater levels of intellectual self-concept and disengagement but lower levels of emotional symptoms (and greater levels of hyperactivity in the nested model). Finally, resilience was associated with being male.

5.6. Conclusions

A theoretical model of resilience was developed, based on a review of the resilience and educational literature. The variables from the GUI database that were found to be unique predictors of resilience at ages nine and 13 in the logit models presented in Chapter 4 were applied to the theoretical model and two hypothesised models of resilience were developed and tested, one at age nine and the other at age 13. Each model was evaluated with reference to three model fit indices: the CFI, the RMSEA and the normed chi square. Model fit is an indication of the extent to which the model that best represents the data reflects underlying theory. While each hypothesised model was found to be an improvement on its corresponding null model, some of the model fit statistics for both hypothesised models indicated that the models did not fit the data well.

In the current study, both full models of resilience were deemed to have met the criteria for good model fit according to the RMSEA values but not the CFI values. The RMSEA assess how well the model fits the sample data, while the CFI assesses proportionate improvement in the model (compared to the null model) and is particularly sensitive to complex models. However, the RMSEA value of the null model at age nine suggested that pathways included in the full model did not offer a considerable improvement over the null model (which hypothesises that all variables are uncorrelated), indicating that alternative models may be as good as, or better, at explaining resilience at age nine. Also, the normed chi-square figures for the model at age nine was just above the cut-point associated with a well-fitting model, while at age 13 the normed chi square was just within the range indicating a well-fitting model. When the model fit statistics are considered together, it is concluded that there is not enough evidence to indicate that the final model at age nine fits the data well, but there is at least partial support of the full model of resilience at age 13.

It was decided to address the issue of model complexity by testing nested models, one at each age level, which included just the pathways between variables that were directly related to resilience in the hypothesised full models. These pathways included the relationships between self-concept, psychological adjustment, engagement with school, gender (at age 13) and resilience. The nested model was found to be a good fit of the data at age 13, supporting the theory that intellectual self-concept, hyperactivity, emotional symptoms and gender are directly related to resilience; that hyperactivity and emotional symptoms are directly related to intellectual self-concept; disengagement is directly related to hyperactivity and intellectual self-concept; and that gender is directly related to hyperactivity, emotional symptoms, disengagement and intellectual self-concept. The model fit statistics for the nested model at age nine indicated that this model was an improvement on the null model (i.e. the CFI was >.95) but the model did not fit the sample data well (i.e., the upper range of the RMSEA was >.06; the normed chi-square was greater than three). This further suggests that the full model of resilience at age nine does not adequately explain the pathways towards academic resilience. These findings indicate that the full and nested models at age nine are not supported by the data, while there is at least partial evidence that the hypothesised and nested models at age 13 are supported by the data.

One of the main differences between the two full models of academic resilience was that gender emerged as a significant predictor of resilience at age 13 but not at age nine. Boys were significantly more likely to be classified as resilient than girls and also to have above average levels of intellectual self-concept and below average levels of emotional symptoms. However, the data show that gender does not act as a moderator between emotionality and resilience; between intellectual self-concept and resilience, nor between hyperactivity and resilience, indicating that the relationship between these variables and resilience does not manifest differently for boys and girls. The finding that boys are more likely to be classified as resilient at age 13 may be related to differences in performance on the tests of achievement between boys and girls. Among the whole GUI sample, boys were found to significantly outperform girls on tests of verbal reasoning and numerical ability.

The results from this chapter suggest that indicators of social and cultural capital contribute to academic resilience but that the relationships between these indicators may differ at age nine and 13. The final and nested models of resilience at age 13 also highlight the importance of child factors (specifically their self-concept, psychological adjustment and engagement in school) in influencing resilience.

Chapter 6 considers the implications of the findings from the full and nested models tested at nine and 13 years old.

Chapter 6. Conclusions and implications

This chapter describes the main results of current study and considers a number of conclusions and implications that can be drawn from these findings. Firstly, a brief overview of the current study is presented.

6.1. Overview of the current study

Resilience in the field of education and elsewhere has become more popular in recent times both as a research topic and an area of policy interest. While many studies have identified factors associated with resilience in education, the literature is quite fragmented, both in terms of how the concept is operationalised and how predictors are identified. For example, some studies have defined resilience in terms of academic outcomes, while others have defined it as engagement in or attitudes towards education. However, as many definitions of resilience in education can be considered to be interconnected (e.g., academic achievement and engagement in education) it is likely that factors associated with one form of educational resilience may also be associated with other forms. Also, while much of the literature emphasises the interrelation of factors from different contexts in the development of resilience, many studies just focus on identifying factors from one or two specific areas of a child's life (e.g., school or home factors). Few studies examine these factors from different contexts together in such a way as to provide a holistic view of resilience and those that do focus on factors from a small number of specific contexts. Also, few studies examine the processes through which these factors contribute to resilience, making it difficult to conceptualise a more holistic view of resilience in a particular domain.

The current study expands on previous research by bringing together the educational and academic resilience literature in such a way as to create a model that includes factors from across the whole spectrum of the child's life and that illustrates the processes through which these factors can contribute to more academically resilient outcomes. This model, drawing on Bronfenbrenner's bioecological theory of development, focuses on meso-systemic interactions, which have received little attention in studies of resilience. Furthermore, these factors and processes can be conceptualised as social and cultural capital and the model was tested among children at risk of poverty. In this way, the model can add to the our understanding of indicators of socioeconomic status and their relationship with social marginalisation in education, an aspect of educational research which Caro, Sandoval-Hernandez and Ludtke (2014) argue lacks solid theoretical meaning.

Also, while much of the resilience literature underlines the importance of viewing this concept in the context of the developing child, it is not clear how the association between the many factors identified in the literature and resilience manifest or change as children develop. The model proposed in the current study is developed around broad constructs that are considered to be important contributors to academic resilience and positive outcomes throughout a child's life. The Growing Up in Ireland (GUI) study was selected as the means of testing this model, as the study contains a wealth of information from across many different contexts in children's lives in Ireland. The study also collects this information at different age points, offering an opportunity to examine these factors and processes at nine and 13 years old.

In the current study, predictors of resilience were identified at both nine and 13 years old. These predictors were organised under seven categories which were considered to represent the main areas of a child's life associated with academic resilience: their family background characteristics; their relationship with their family members (primarily their parents), their teachers and their peers; their parents', their teachers' and their own educational expectations for themselves; their attitudes towards school; their parents' involvement in their education; their engagement in school and activities outside of school; and their psychological adjustment and self-concept. Logistic regression analysis identified the most prevalent predictors of academic resilience, i.e., those that remained statistically significant when other factors were accounted for, for each of these areas separately. All the logit models tested at nine and 13 years old were found to be statistically significant, confirming that factors from across the whole spectrum of the child's life significantly distinguish between more academically resilient and vulnerable children at both age levels. The variance for many of the models tends to be low, suggesting that these models might work better in combination than individually, in terms of explaining academic resilience.

The findings from this study suggest that processes contributing to academic resilience could differ for children at age nine and 13 and these differences may be contributing to the differences observed in the fit of the logit models at age nine and 13. The variance explained in each model can give some insight into how well each of the models explain the relationship between the selected variables and academic resilience at the different age levels. For example, the variance explained by logistic regression models examining academic resilience and parental involvement, parents' educational expectations for their child and psychological adjustment is satisfactory or highly satisfactory at age nine but is small at age 13. On the other hand, the variance explained by the child's lifestyle and the child's own educational expectations is highly satisfactory at age 13 but is small at age nine. These findings suggest that these factors may play differing roles in the academic resilience process at the different age levels. However, direct comparisons cannot be made between the corresponding logistic regressions models at nine and 13 years old, due to different types of measurements used as well as differing relationships between factors and academic resilience at the different age levels.

The finding that the variance in academic resilience explained by parental involvement and parents' educational expectations for their child is satisfactory or highly satisfactory at age nine but is small at age 13 suggests that parents may play a more direct role in influencing their child's behaviour in middle childhood than in later childhood. Previous research has found that time spent with family recedes from late childhood into early adolescence, with time spent with siblings and extended family diminishing most across this time period (Larson & Richards, 1991; Nickerson & Nagle, 2005). However, direct contact with parents has not been found to decline (Raffaelli & Duckett, 1989). Indeed, Nickerson and Nagle (2005) suggest that parents are never relinquished as attachment figures, rather they move down in the attachment hierarchy. This indicates that parents continue to have one-to-one opportunities to interact, influence and support young adolescents. What does appear to change during this period, however, is the nature of the relationship between parents and their children.

The predictors identified through logistic regression analysis were applied to a multi-dimensional model of academic resilience that illustrated the pathways through which these factors can contribute to academic resilience. Two models were tested, one at age nine and one at age 13, using structural equation modelling. The models at age nine and 13 were evaluated with reference to three indices of model fit, i.e., how well the proposed pathways fit with the specific dataset. At age 13, two out of the three model fit statistics indicated that the model fits the data well. This model included all factors that emerged as significant predictors of academic resilience in the logistic regression analysis at age 13 and outlined the pathways between these factors that remained statistically significant when all factors were considered together. In this way, the model of academic resilience at age 13 fits with Bronfenbrenner's ecological model of child development and confirms that academic resilience is the outcome of interrelations between many factors from across the child's life. Nevertheless, this model accounted for just 16.7% of the variance in academic resilience, indicating that it does not fully account for all predictors and pathways associated with academic resilience. Therefore, it should be noted that while there is some support for the pathways specified in this model at age 13, it is possible that other models specifying different pathways may offer as much, or more, of an explanation of academic resilience. On the other hand, the model fit statistics for the model at age nine did not offer enough evidence to suggest that this model fit the data well, and in fact indicated that the paths specified by the hypothesised model did not offer much improvement over of the null model in terms of explaining the paths of academic resilience.

The current study indicates that the child's behavioural adjustment and self-concept play an important role in influencing academic resilience, and that these in turn are related to the child having a supportive family environment and a positive relationship with their teacher. The child's engagement in their schooling, as well as other activities outside of school, also influences their self-concept and behavioural adjustment through the acquisition of new skills and their engagement is related to their relationship with their teacher, their attitudes towards school (which is also associated with a positive relationship with teacher) as well as having parents who are actively involved in their child's education, parents who have greater expectations for their child's educational attainment and greater access to cultural capital such as higher levels of parental education. These findings indicate that factors and resources that contribute to academic resilience come from across the whole spectrum of the child's life, are interrelated and should be considered in the wider context in which they occur. The current study can add to the literature on social marginalisation in education by providing a framework through which to understand the multifaceted nature of academic resilience.

The findings from the current study also have implications for social policy in the area of education in Ireland. In particular, policy interventions aimed at building on strengths and strategies among high-risk populations should operate on multiple levels, taking account of the ecological system that they operate in. By focusing on the resilience framework, such interventions may not only focus on eliminating risk factors that may undermine individual adjustment but can also emphasise strengths and focus on positive outcomes, therefore moving away from a deficit model.

Probably the most pertinent policy initiative related to academic resilience in Ireland is the DEIS (Delivering Equality of Opportunity in Schools) programme, which was revised in 2017. The new DEIS strategy sets out a number of targets aimed at improving outcomes for children at risk from social marginalisation in education. Included among these are targets to increase the percentages of children performing at the highest levels of reading and mathematics in national and international standardised assessments (Department of Education and Skills, 2017b). Such targets indicate a strategy oriented towards academic resilience, although this is not explicitly stated. Other targets, including raising teacher expectations among students in relation to their higher education potential, improving levels of parental engagement in their school communities and improving linkages between schools and their communities, also fall within the resilience framework outlined in the current study.

The remainder of this chapter considers key findings of the current study and implications that may be drawn from them. Firstly, consideration is given to variation in the experience of risk or adversity among children considered to be experiencing poverty, followed by a reflection on the conceptualisation of resilience as a dynamic concept that may change over time. Next, consideration is given to the influence of economic capital on academic resilience and this is followed by a discussion of the relationship between academic resilience and psychological wellbeing. The findings are also discussed in terms of the developing child, with reference to the roles of parents, teachers and peers in the formation of academic resilience as well as the relationship between gender and academic resilience. The limitations of the study and potential areas for further research are also discussed. This chapter ends with some final thoughts on the main conclusions from the current study.

6.2. Variation in experience of risk

The first step in the analytic strategy was to define and identify children demonstrating greater levels of academic resilience. Resilience is a two-dimensional construct that is defined by experience of adversity or risk and the exhibition of successful adaptation in the presence of that adversity or risk. In the current study, academic resilience is defined as better than expected achievement outcomes among children at risk of poverty. Specifically, children whose family have access to a full medical card were considered to be at risk of poverty as eligibility for a medical card is determined by lower household income. Access to a medical card can be considered an absolute, rather than relative, measure of economic adversity as access is based on need. In this way, this study differs from some studies of resilience that define adversity in terms of relative position on a scale of socioeconomic status (i.e., the bottom quartile on a scale of socioeconomic status; OECD, 2011)

Concerns have been raised in the resilience literature about treating 'at-risk' individuals as homogenous groups and not accounting for possible variations in the experience of risk factors, particularly in studies that define risk in terms of statistical probabilities rather than actual risk. Luthar and Cicchetti (2000) highlighted the issue of subjective perceptions of risk in resilience research, i.e., that which may be deemed as harmful to one individual may be perceived as relatively neutral to another. Indeed, many individuals who are classified as 'at-risk' for research purposes may not consider themselves as experiencing adversity or disadvantage. While it is likely that there is variation in the experience of risk factors among medical card holders, all can be considered to be experiencing some poverty as all have been deemed to be in need based on household income. Furthermore, the purpose of the current study was to explore the variability in the experiences of these children that may contribute to academic resilience.

Despite this, it must be acknowledged that there are experiences in these children's lives, related to their economic status that cannot be accounted for in the current study. For example, of those who had access to a medical card at age nine, 85% also had access to a medical card at age 13, while 16% did not have access to a medical card at age nine but did so at age 13. This indicates that of the children classified as at risk of poverty in the current study at age 13, some may have experienced economic hardship over a longer period than others and therefore may have a qualitatively different experience of economic adversity. Indeed, the economic crises experienced by the country in the years between the first two waves of the study is likely to have contributed to changes in families socioeconomic status and therefore eligibility for a medical card among some members of the population. The Primary Care Reimbursement Service statistical report for 2012 (PCRS, 2012) reports that at the end of 2012 almost 41% of the population held medical cards, representing a 60% increase since 2005.

The current study also shows that while more academically resilient children may be at risk of poverty, they are more likely to experience greater levels of social and cultural capital than their more vulnerable peers. For example, while the families of both more academically vulnerable and resilient children are less likely than expected to have parents whose occupation falls into the professional/managers category at both age levels, a greater proportion of children demonstrating greater levels of academic resilience have parents whose occupations falls into the professional/managers category when compared to more academically vulnerable children at both age levels. Also, children whose highest level of parental education is a degree or higher were about 12 times more likely to be classified as academically resilient at age nine and about 14 times more likely to be classified as academically resilient at age 13 than those whose highest level of parental education is lower secondary. Therefore, while the families of more academically resilient children in the current study may find it more challenging to purchase advantage for their children (such as buying books or extra tuition) relative to their better-off peers, they have many other forms of capital available to them which offers them an advantage over their more academically vulnerable peers.

This variation in the experiences of children deemed to be at-risk points towards a distinction between those children whose families have experienced ongoing, intergenerational poverty and those who have been exposed to poverty in more recent times and who have access to previous resources (such as parent's education attainment). Drawing on the Principle of Cumulative Advantage, it could be expected that children who have access to some resources may experience an advantage over children without such resources, and that this advantage will compound over time into an increasingly larger advantage. The final model of academic resilience at age 13 demonstrates how access to these resources can contribute to more positive outcomes. For example, parents who had higher levels of education were more likely to have higher expectations for their child's educational attainment. Parental expectations were, in turn, related to the child's own expectations for their educational attainment, illustrating how cultural capital can be transmitted from the parent to the child. Parental education level was also positively associated with parental involvement in their child's education, demonstrated by a greater frequency of helping their child with their homework.

McLoyd (1998) noted that persistent poverty is consistently found to have more damaging effects on IQ, school achievement and socioemotional functioning than occasional or transitory poverty. She also noted that 'home-based cognitive stimulation, parental involvement in children's schooling, teachers' expectations and affective orientations and the material resources and instructional policies of schools contribute to economic group differences in children's school achievement.' It is likely that differences in the experiences of risk among children with access to a medical card in the current study are also related to differences in access to social and cultural capital. Such differences do not invalidate the measure of risk in the current study but are precisely the factors that the model of academic resilience aims to explore. As Schoon (2006) notes, 'what distinguishes a high-risk individual from others is not so much exposure to a particular risk factor, but rather a life history characterised by multiple disadvantages' (p.9).

Perhaps the most challenging aspect of interventions aimed at promoting positive outcomes among children experiencing social marginalisation is identifying those most in need of such interventions. Indeed, in recent times there has been criticism of the methods used to identify schools for the DEIS initiative, with some people arguing that some schools in receipt of extra supports under the DEIS initiative have lower concentrations of poverty than a number of schools not in receipt of DEIS supports (https://www.kildarestreet.com/debates/?id=2017-04-05a.266). However, as has been demonstrated in the current study, some children experiencing poverty may have access to other resources which can contribute to academic resilience, indicating that vulnerability cannot be determined solely by economic factors. While it is important that all schools experiencing higher concentrations of poverty have access to the resources required to tackle social marginalisation among their pupils, this should not come at a cost to other 'less disadvantaged' schools (Downes, 2017b).

That said, the current study also noted that two-thirds of children with access to a medical card were not attending schools in receipt of the School Support Programme under DEIS. While the social context in which these children are experiencing education may offer some benefit over those in contexts with a greater concentration of social marginalisation, it cannot be taken for granted that a social context effect will offset the experience of social marginalisation in education. The current study also highlights the need to expand initiatives to address social marginalisation beyond their current reach. If the aim is to raise educational outcomes to levels comparable to the rest of the population it should be acknowledged that initiatives to tackle educational inequality need to have a long term vision and aim to expand their reach beyond schools or individuals in areas with a high concentration of social marginalisation. As Schoon (2006) notes, targeting of services needs to occur at every age and every stage of development and she suggests access to services should be facilitated for all.

6.3. Resilience as a dynamic concept

Children whose families had access to a medical card were classified as demonstrating academic resilience or vulnerability, according to their performance on the standardised tests of academic achievement administered as part of the GUI study. Children demonstrating greater levels of academic resilience were defined as those whose families had access to a medical card and whose reading and mathematics scores at age nine, and verbal reasoning and numerical ability scores at age 13, were at least half a standard deviation above the corresponding mean scores of all children. About 3% of children at age nine and 3.5% at age 13 were classified as demonstrating resilience in the current study. More academically vulnerable children were defined as those whose families had access to a medical card and whose reading and mathematics scores at age nine, and verbal reasoning and numerical ability scores at age 13, were the same as or below the corresponding mean scores of all children whose families had access to medical card.

Concerns have been raised in the literature about the instability of the concept among more resilient individuals. Some studies have found that a number of at-risk individuals who excel at a particular point in time subsequently experience a considerable decline in their levels of adaptation (Luthar & Cicchetti, 2000). The current study provides some evidence of the changing nature of academic resilience over time. It was found that, of those who were classified as showing greater levels of academic resilience at age nine, 27% also demonstrated resilience at age 13, while 2% were considered more academically vulnerable.

Such findings emphasise the need for continuing support for children throughout their school careers. As Schoon (2006) has noted, interventions aimed at fostering resilience should focus on responding to children's 'changing needs at different life stages and in a changing sociohistorical context' (p. 165). While the current study focussed on academic resilience among children in the middle-childhood to early adolescence age range, it is recognised that resources to close the gap between children experiencing greater levels of advantage and those experiencing social marginalisation need to be directed at families and neighbourhoods before children start school. Indeed, interventions such as the Preparing for Life programme, which is aimed at families from pregnancy through to when the children start school, can improve low levels of school readiness by supporting parents to develop skills and knowledge to help prepare their children for school. Such programmes can narrow the gap in terms of academic and socioemotional outcomes between children at risk of poverty and their more privileged peers.

Also, the sociohistorical context may be particularly pertinent in the current study as the data was collected during a time of unprecedented economic change. The numbers of families in receipt of medical cards in Ireland has increased substantially since the mid-2000s, indicating greater levels of poverty than a decade ago. This is likely to be an on-going challenge for schools and while many resources offered as part of the DEIS initiative have been protected by governments during the economic crises, it is important that continuing and sustainable protective supports are directed at all children.

It needs to be acknowledged that the definition of academic resilience in this study may have contributed somewhat to the shift in classifications observed. For example, the mean achievement scores of those who were classified as academically resilient at age nine, but not at age 13 (and vice versa) were just below the scores used as cut-points for the classifications of academic resilience at both age levels. This indicates that many of these children were still achieving to a high level and just missed out on inclusion in the academically resilient category by a few points.

When using arbitrary cut points as definitions (such as half a standard deviation or more above the mean) there will always be cases that fall just below the cut point and therefore are not included in the classification of interest despite sharing many similarities with cases that fall at the cut point or just over it. Also, the phenomenon of regression towards the mean (i.e., if a variable is extreme on its first measurement, it will tend to be closer to the average on its second measurement) can add to the instability of the research findings from studies of resilience over time. This has implications for studies that rely on definitions using arbitrary cut points, particularly studies of resilience, as researchers are often dealing with two extremes, i.e., those who are at one extreme on the adversity continuum (high adversity) and at one extreme on the competence continuum (high competence). But, perhaps more importantly, it also has implication for policy initiatives, such as DEIS, that may similarly rely on such cut points.

Using extreme values to define positive adaptation can be useful in terms of research aimed at identifying the most salient protective factors for those considered to be at risk, even if such extreme outcomes do not form part of the definitions of successful outcomes used in interventions or social policy aimed at promoting positive adaptation. Nevertheless, it is acknowledged that the definition of academic resilience in the current study refers to very high academic functioning which is a very specific form of positive adaptation and other forms of adaptation may be considered to be just as or more relevant in defining successful outcomes (Downes, 2007). As Schoon (2006) notes, the identification of resilience involves value judgements about differences between expected and observed outcomes. With the recent emphasis on increasing the proportion of students performing at the highest levels on standardised assessment of literacy and numeracy (Department of Education and Skills, 2011; 2017a), high academic functioning may be considered as relevant in the wider cultural context in which the study is situated. However, this does not necessarily mean that subcultural norms will align with the ideals of the wider cultural context and defining success as high academic functioning may not be meaningful nor desirable for all individuals in the population of interest.

6.4. The influence of economic capital on academic resilience

Children showing greater levels of academic resilience at both age levels were found to come from families with considerably lower mean income than the national average. However, the mean income of the families of these children at age nine was found to be significantly higher than that of the families of more academically vulnerable children (although still considerably lower than the national average). While the difference between the income of families of more academically resilient and vulnerable children at this age is small, and children demonstrating greater levels of academic resilience have been found to actually outperform children whose average household income is much greater than theirs, it is still possible that there may be some relationship between economic capital and academic resilience among children whose families have access to a medical card at age nine, with economic capital having a disproportionate effect for those on lower income levels.

Also, in the second wave of GUI, the household incomes of all groups of children was lower than in wave one, more than likely as a result of the economic crises experienced by the country in the intervening years. However, in contrast to wave one, the household incomes of more academically resilient and vulnerable children were very similar and did not differ significantly from each other at age 13. While this levelling off in the household income between more academically resilient and vulnerable children may be an artefact of the economic crises that occurred in the years between the two studies, it does also raise the question as to whether the effect of family economic conditions on achievement outcomes may diminish somewhat with age. Related to this, it is interesting to note that while the proportion of income that a household receives from welfare was found to be a significant predictor of resilience at age 13 (even when parental education level was accounted for) there were no significant relationships between income from welfare and any other variable in the model of resilience. These findings indicate that factors other than economic capital have a more prominent role in the pathways towards resilience among this age group.

The finding in the current study that the model of academic resilience is a better fit of the data at age 13 than at age nine also suggests that indicators of social and cultural capital are stronger predictors of academic resilience in late childhood and early adolescence than in middle childhood, further suggesting that the influence of economic capital diminishes with age. This finding adds an interesting dimension to Bourdieu's conceptualisations of economic, social and cultural capital and how the influence may vary throughout the development of the child. It also contributes to previous research examining the effects of income on children's academic attainments, which have provided mixed findings. Some studies have found that the relationship between socioeconomic status and achievement diminished with age (White, 1982; Duncan, Yeung, Brooks-Gunn & Smith, 1998), while others have noted similar effects across different age ranges (Smith, Brooks-Gunn & Klebanov, 1997). However, differences in the findings across these studies may be related to the measures of socioeconomic status used. Nevertheless, the finding that, of all the indicators that contribute to the Economic, Social and Cultural Status (ESCS) scale in the PISA study, family wealth shows the weakest relationship with achievement outcomes is consistent with the evidence in the current study.

The findings in the current study support Bornstein's and Bradley's (2003) statement that 'as children age, SES increasingly operates through the social capital afforded by parents and through neighbourhood-community connections and resources' (p.1). Much of the literature examining the pathways through which socioeconomic status affects children's outcomes focuses on the comparison between high socioeconomic status and low socioeconomic status groups. Of note, the current study indicates that even within a group of children experiencing economic adversity there is variation in the economic, cultural and social capital experienced by these children and this variation appears to be contributing to the academic outcomes of the sampled students. Therefore it appears, that social marginalisation is not experienced equally by everyone who is purported to belong to this group. This has important implications, not only for resilience research, but also for educational policy that aims to target resources at children and families based on group characteristics.

6.5. Academic resilience and psychological wellbeing

The current study found that a more positive intellectual self-concept was associated with greater likelihood of academic resilience at age 13, while greater levels of hyperactivity and emotional symptoms were associated with a lower likelihood of academic resilience. Also, as hypothesized, aspects of the child's psychological adjustment were found to be directly related to aspects of their self-concept. Lower levels of hyperactivity and emotional symptoms were associated with greater levels of intellectual self-concept in the final model. These findings highlight the role of psychological wellbeing in the development of academic resilience and the need for effective emotional support services in schools to support children who may be experiencing significant threats to their psychological wellbeing. This is particularly pertinent in the current social climate in Ireland where the rate of children experiencing considerable instability in their living circumstances, such as homelessness is steadily increasing (one in three people experiencing homelessness in Ireland in 2017 is a child; Department of Housing, Planning and Local Government, 2017).

Harter (2008) describes how children's self-descriptions become increasingly interpersonal as they move into late childhood as relations with others become increasingly salient dimensions of the self. Also, the ability to use social comparison for the purpose of self-evaluation, the ability to differentiate real from ideal self-perceptions and increasing social perspective-taking skills mean that self-perceptions can become more negative in middle childhood compared to the very positive self-perceptions of most young children. The realisation of not meeting one's expectations can lower the child's self-esteem during this period. As Harter notes, those who have displayed success or have received praise for competence will fare best in terms of positive self-evaluations. As more academically resilient children will have much greater experience of academic success this may lead to greater expectations for success over time. Such experience and expectation may serve to solidify a more positive self-concept and behavioural adjustment as the child grows. Indeed, the finding that the nested model at age 13 (which examined aspects of the child's psychological adjustment and self-concept and academic resilience) was a much better fit of the data than the nested model at age nine, seems to confirm this hypothesis.

Given the significant relationship between the child's behavioural adjustment and self-concept and academic resilience at age 13 in the current study, initiatives aimed at supporting well-being and mental health should be a central component of any initiatives to address social marginalisation in education. The proposal to support and develop well-being initiatives by extending programmes such as the Incredible Years Teacher Programme (a classroom-based programme designed to reduce conduct problems and promote pro-social behaviour) and the Friends programme (a programme designed to help children manage all kinds of emotional distress) within DEIS schools, as well as increasing the National Educational Psychological Service (NEPS) time allocation in DEIS schools seem particularly important aspects of the School Support Programme under DEIS (Department of Education and Skills, 2017b). However, as Downes (2017b) notes, to be truly effective, schools need further support in the form of a firmer commitment to specific multidisciplinary teams.

The current study also notes that indicators of social capital, including the child's relationship with their parents and their engagement in social networks outside the family and school, are associated with the child's self-concept and psychological adjustment, which in turn are associated with academic resilience. The final model at age 13 supported the theory that engagement in extracurricular activities could promote a more positive self-concept and psychological adjustment. Specifically, participation in sport was associated with lower levels of emotional symptoms and a more positive intellectual self-concept. More frequent reading for pleasure was also associated with a more positive intellectual self-concept and participating in a homework club was related to greater levels of hyperactivity. Many schools that are in receipt of the School Support Programme under DEIS offer homework clubs as extra support for children after school. Many children who participate in these clubs do so because of poorer levels of achievement, which, in turn, may be related to other factors such as greater levels of hyperactivity, leading to the overrepresentation of such children in this group as found in the current study.

Schools participating in the School Support Programme under DEIS have access to additional literacy and numeracy support services. Nevertheless, the current study suggests that children experiencing social marginalisation could also benefit from additional extracurricular supports, which do not necessarily focus on literacy and numeracy skills but which may contribute towards children developing other competencies which can have beneficial effects on thier psychological wellbeing. King, McDougall, DeWit, Hong, Miller et al., (2005) propose that three types of processes lead to developmental competences: opportunity, support and skill development through activity participation. Competence is enhanced through the environments that are welcoming (opportunity), the support that can be expected from others (through emotional support as well as practical assistance) and actual participation in activities which leads to the development of underlying or foundational skills.

6.6. The role of parents, teachers and peers in the development of academic resilience

As noted in the previous section, children's psychological wellbeing is associated with academic resilience. Harter (2008) noted that parents, teachers and peers can play a role in the formation of a child's self-ideal through communication of their expectations for the child and this, in turn, can contribute to resilience. Harter states that while parental support is a major predictor of global self-worth throughout the childhood years, 'as the child moves up the developmental ladder, other sources of support emerge where peer support becomes increasingly important' (p.233).

The final model at age 13 supported the hypothesis that particular aspects of the child's relationship with their family were associated with particular aspects of their self-concept and psychological adjustment. Greater levels of demandingness and responsiveness from the mother were associated with a more positive intellectual self-concept, while greater levels of disclosure were associated with lower levels of hyperactivity. Also, greater levels of conflict with the child's secondary caregiver were associated with greater levels of hyperactivity and emotional symptoms, and lower levels of intellectual self-concept. As with other relationships in the final model, there is likely to be a reciprocal relationship between the child's relationship with their parents and family and their psychological adjustment and self-concept.

Also, in the final model, greater parental expectations for how far their child will go in education was associated with the child having greater expectations for themselves and also associated with lower levels of disengagement from school. However, the child's own expectations were not found to be significantly associated with disengagement from school in the final model of academic resilience at age 13. Parental involvement in their child's education was also hypothesized to be directly related to the child's expectations but this relationship was not supported by the data at age 13. These findings are in line with research that found that the roles of guidance and authority in the child-parent relationship became more dominant in adolescence and a perception that while parents granted adolescents greater levels of responsibility they were also more concerned about issues such as working hard at school or doing well in examinations (Nixon & Halpenny, 2010).

The child's relationship with their teacher was also found to be a significant predictor of academic resilience and was hypothesised to be associated with the child's expectations for how far they would go in education, the child's level of disengagement from education, their attitude towards school and their self-concept. At 13-years-old the child's relationship with their teacher was measured by children's reports of how often the teacher says that their work is good and how often they are praised by their teacher. Thirteen year old children who were told that their work was good by their teacher more frequently had higher expectations for themselves, a more positive intellectual self-concept, reported liking school more and were less disengaged from school. On the other hand, there was no direct relationship between how often the child was praised by their teacher and any other variable in the final model of academic resilience at age 13. These findings support concepts put forwards by Rosenthal and Jacobson (1968) (and supported by Rubie-Davis [2010] and Urhahne [2015]) that teacher interactions with their students promotes their academic development through their expectations and behaviours.

The frequency of a teacher telling a child their work was good was also found to be related to lower levels of disengagement from schools which in turn was found to be related to the child's psychological adjustment and self-concept. Specifically, lower levels of disengagement were associated with lower levels of hyperactivity and greater intellectual self-concept. The child's attitude towards school was also associated with the child's teacher telling them that their work is good and their level of disengagement from school in the final model of academic resilience. Children who liked school more reported lower levels of disengagement from school. Such findings emphasise the role that teachers can play in recognising key strengths in students and in promoting a more positive self-concept and attitude towards schools.

Teachers interact and communicate with children in their classrooms in many different ways and these findings suggest that even subtle differences in communication may operate in different ways. Teachers may offer general praise to all children based on effort rather than performance but communicate more specific approval to those who demonstrate good performance. Of course, there may be a bi-directional relationship between children's outcomes and receiving praise from their teacher. Children who do well in school may receive more positive feedback from their teacher, which can promote more positive attitudes towards school, more positive self-concept and greater expectations, which all may contribute to better performance in school.

While it was also hypothesized in the current study that the child's relationship with their peers is directly related to their attitude towards school, their psychological adjustment and self-concept, none of the variables measuring the child's relationship with their peers were significantly associated with academic resilience at age 13 and therefore not included in the final model of academic resilience. It has been noted that as children enter adolescence not only does time spent with peers increase but also the nature of peer relationships change. Early adolescents tend to seek less advice from their parents and more from their friends and may be willing to forego their parents' rules in order to keep, and be popular with, friends (Fuligni & Eccles, 1993). The second wave of GUI surveyed children when they were thirteen-years-old and although some have made the transition to post-primary education, some were still in primary school. These children are on the cusp between late childhood and early adolescence and it may be that the nature of their relationships with parents and peers are still in transition. However, it should also be noted that the GUI data was limited in terms of measuring relationships with peers and the selected variables in the current study may not have been adequate to measure the hypothesised relationships.

6.7. Gender and academic resilience

As the field of research in resilience has grown, definitions of the concept have become more dynamic, recognising that human adaptation and development are shaped by many interactions within the individual and also between the person and the environment, including interactions with family, peers, school and community (Masten, 2015). In this way, factors specific to the child still remain integral to conceptualisation of resilience. An interesting finding in the current study is that while gender was not significantly associated with academic resilience at age nine, it emerged as a significant predictor at age 13. As well as being directly related to academic resilience, gender was also found to be significantly associated with children's level of emotional symptoms, intellectual self-concept, educational disengagement and hyperactivity (in the nested model only) at age 13. Boys reported lower levels of emotional symptoms; greater levels of intellectual self-concept, greater hyperactivity and greater educational disengagement; and greater levels of academic resilience. However, it was noted that gender did not act as a moderator between emotional symptoms and academic resilience, intellectual self-concept and academic resilience, hyperactivity and academic resilience or disengagement and academic resilience at age 13. The finding that being male is associated with academic resilience in this study is in contrast to the research conducted by Ricketts, Englehard and Chang (2015), which found that girls report higher levels of academic resilience than boys.

While the models at age 13 suggest that the relationship between emotional symptoms, intellectual self-concept, disengagement and resilience do not differ by gender, it is interesting to note that the association between gender and academic resilience has emerged as the children enter adolescence. Other research on achievement has found that psychosocial factors related to specific subjects (i.e., mathematics anxiety, engagement in reading) explain gender differences in performance (OECD, 2015). It may be possible that the psychosocial factors measured by GUI may not be specific enough (in terms of subject area) to account for the gender differences observed in academic resilience.

It also seems likely that the finding that girls are less likely to be classified as academically resilient at age 13 is linked to general gender differences in performance. The current study found that girls performed significantly less well than boys on the tests of verbal reasoning and numerical ability. This is somewhat in contrast to previous studies of performance among students in Ireland that have found significant differences in favour of boys for mathematics (Shiel, Kavanagh & Millar, 2014; Shiel, Kelleher, McKeown & Denner, 2016) and in favour of girls for reading (Eivers & Clerkin, 2012; Shiel et al., 2016). Where gender differences were noted in other studies of achievement, these were larger among older students (a tenth of a standard deviation at Second class (Shiel et al., 2014), compared to a sixth of a standard deviation among 15-year-olds (Perkins, Shiel, Merriman, Cosgrove & Moran, 2013) suggesting that the association between gender and performance increases with age. This has important implications for studies of academic resilience, especially where reading and mathematics performance forms an inherent part of the definition of academic residence.

The relationship between gender and academic resilience warrants further research, especially given the inconsistent nature of this relationship across studies. However, it does suggest that different supports, in terms of intervention to address difficulties in literacy and numeracy, may be needed for boys and girls who are at risk of social marginalisation.

6.8. Limitations of this study

A number of limitations in the current study need to be noted. Firstly, structural equation modelling (SEM) was used to test the predictors and processes associated with academic resilience for two age cohorts. SEM was employed as it can specify relationships between many different variables simultaneously. However, it is limited in its ability to explore reciprocal causality (King et al., 2005). The direction of the particular pathways specified in the current study were based on the resilience and education literature and while it was not an explicit aim of the current study to examine bidirectional relationships, it must be acknowledged that many of the pathways tested in the current study may be reciprocal. For example teachers' may have higher expectations of children who are more engaged in education, but teacher's expectations may also contribute to greater educational engagement by the child. Further research examining reciprocal relationships between specific variables may provide a greater understanding of the pathways found in this study.

It should also be noted that due to the context specificity of SEMs, the paths might change if anyone is removed (Thompson, 2000). Therefore the predictors and paths found in the current study should be interpreted with some caution. In addition, the confirmation bias of SEM (Robles, 1996), indicates that additional models should be tested (Tanaka, 1993), using other datasets before firm conclusions can be drawn. The current study does however, provide a framework for understanding academic resilience and a template on which further studies of academic resilience can be based. Also, as the next wave of data collection for the infant cohort in the GUI study will be at nine years old, this sample could be used to validate the model developed in the current study (or variations of it).

An important consideration when using structural equation modelling is the interpretation of model fit statistics. As noted in Chapter 5, each index of model fit has their strengths and limitations in different contexts. For example, the Comparative Fit Index (CFI) is one of the measures least affected by sample size however, it is sensitive to model complexity, meaning it is difficult to interpret models with many parameters such as the models in the current study. Also, while large samples are required to explore models with many parameters, the chi-square statistic is sensitive to sample size, therefore creating difficulties in interpretation of model fit. In an effort to combat difficulties around interpretation of model fit, three indices were used to evaluate the models in the current study. Both of the full models of academic resilience in the current study were deemed to have not met the criteria for good model fit according the CFI values. As the CFI is particularly sensitive to complex models, nested models examining just the relationships between aspects of the child's psychological adjustment, aspects of their self-concept, their level of disengagement from school, gender (at age 13 only) and academic resilience were also tested. Such analysis could be expanded to test additional sections of the model of academic resilience in future analysis. These nested models could be constructed in such a way so that there is some level of overlap to allow inferences about pathways that traverse across the many contexts of a child's life to be formulated.

Also, while there was at least partial support for the model of academic resilience at age 13, there was less support for the model at age nine. This suggests that the predictors and pathways associated with academic resilience may change somewhat from late childhood to early adolescence. Due to variation in the variables used at each wave point it is not possible to make direct comparisons between the two models. Therefore, the researcher is limited in the conclusions that can be drawn on the developmental contexts associated with academic resilience. Making modifications to the model at age nine may have provided a better fitting model and provided insight to ways in which the pathways to academic resilience may change through development. However, such an approach would likely have resulted in 'over-fitting' the model to the particular dataset and is inadvisable (Stride, 2015). Therefore, new theoretical models of how the processes associated with academic resilience may change over time need to be developed based on theory and the relevant literature and tested with other data sets.

The Growing Up in Ireland study gathers detailed information from a variety of sources on various aspects of children's lives in Ireland and for a large number of participants. Such population-based studies have many benefits in terms of the wealth of information that is gathered and also the statistical analysis that can be conducted with large numbers of participants. However, the constructs that can be examined are limited to those included in the survey. While Growing Up in Ireland contains many variables that can be considered proxies for the constructs of interest in the current study, the study itself was not designed specifically to study academic resilience and therefore the operationalization of some variables was not ideal for the purposes of the current study. For example, while the current study hypothesised that engagement in school would be related to academic resilience, relevant variables from the current study measured the child's level of *disengagement* from school rather than their engagement. While engagement and disengagement could be considered opposites on the same scale, it does not necessarily follow through that those who score low on the scale of disengagement display high levels of engagement in education, rather they are demonstrating an absence of disengagement. Thus, different relationships might be observed if a measure of engagement rather than disengagement was included. Also, no teacher measures were included in wave two of the child cohort, limiting data on the child-teacher relationship to child reports.

In addition, caution must be exercised when interpreting some of the results in the current study as many of the scales and subscales measured in the GUI study display less than adequate internal consistency, thus suggesting that the measurement error associated with these measures may be higher than in GUI than in the studies for which the measures were originally developed. Another factor which must be considered, and may be related to the less than desirable reliability associated with many of the measures in the study, is the response rate in the GUI sample and attrition between wave one an wave two. It is acknowledged that participation among schools in receipt of the School Support Programme under DEIS was lower compared to schools not in receipt of this programme, indicating that children from families with lower incomes and who may be doing less well in school may be underrepresented in the samples. Also, Thornton et al. (2016) have recognised that families where the primary caregiver was better educated were more likely to participate in wave two, suggesting that imbalances in the sample may have been accentuated further. This has implications for the analysis in the current study as it is possible that some children from the population of interest are not represented and therefore findings should be interpreted with this in mind.

Furthermore, while Growing Up in Ireland is a longitudinal study, just two time points of data were available for the child cohort at the time of the current study. As Duncan and Duncan (2009) note, developmental studies should include three or more assessments, to allow for the validity of the straight-line growth trajectory model to be evaluated and more precise parameter estimates. However, as additional data is now available for these children at age 17/18 and further data collection will be conducted when these children are 20 years old, it will be possible to conduct such analysis in future studies. As with any longitudinal study, attrition between waves of data collection is a concern and it should be noted that a considerable portion of children who did not participate in the study at age 13 did not have access to a medical card at age nine. Similarly, in the first wave of data collection, it was noted that response rates were lower among children attending schools in receipt of supports under the DEIS initiative. These findings point to a greater attrition rate among children at risk of poverty. While every effort is made to compensate for any imbalances in the recruited sample through reweighting of the data, it is still possible that such imbalances may lead to some bias in the results reported and should be taken into consideration when interpreting the findings of the study.

Finally, the purpose of the current study was to examine a unidimensional definition of adversity (i.e., economic capital). It should be noted that some children who experience economic adversity may also experience other challenges in the educational context, such as speaking English as second language. The factors and processes associated with better than expected outcomes among children who experience a variety of challenges in the educational context could be explored to validate or contradict the findings in the current study. Similarly, academic resilience is just one indicator of positive adaption and other forms of adjustment which are important in an education context, such as wellbeing, could be explored. Many of the factors found to be associated with academic resilience in the current study have also been found to be associated with depression and anxiety among adolescents in Ireland (Dooley, Fitzgerald & McGiollabhui, 2015). The model developed in the current study could be applied to examine resilience in terms of psychosocial wellbeing among children and adolescents in Ireland.

6.9. Future research

Testing the model at two age points in the current study, applying the same definition of academic resilience for each sample, made it possible to examine if the same processes apply at each age level. Since this study has been conducted, additional data was collected for these children at age 17/18, with further data collection planned for when these children are 20 years old. Testing the model of academic resilience developed in the current study at these additional age points would expand our knowledge of the processes associated with academic resilience beyond the childhood and early adolescent years. Testing the model at these additional age points would also provide further opportunity to validate the model developed in the current study.

As there was not sufficient evidence to support the model developed in the current study at nine years old, this model could be revisited based on the findings of the current study. For example, this model could hypothesis a more direct relationship between parental factors, such as parental involvement and parents' educational expectations for their child, and academic resilience. To gain a greater insight into the specific aspects of the model that best describe academic resilience at age nine, nested models examining parental factors (e.g., parental involvement, parental expectations, relationship with child) and child factors (child's self-concept, psychological adjustment and attitudes) could be tested separately. Testing such models would also overcome issues around model complexity and could be constructed in such a way so that there is some level of overlap, allowing inferences about pathways that traverse across the different contexts of a child's life to be formulated. Furthermore, such analysis could also be applied to the sample at age 13 and beyond to shed light on how different processes may change throughout the life course.

As data has been collected from the infant cohort of the GUI study at nine months and five years of age and it is planned to collect additional data when these children are nine years old, the re-specified model could be also tested, and validated, among this sample at age nine. The model could also be expanded to take account of early childhood processes, such as cognitive functioning and parental childcare practices in the early years (e.g., reading to the child). The availability of data from both the infant and child cohorts provides a unique opportunity to gain detailed information on the processes associated with academic resilience from early infancy right through to adulthood.

An interesting finding in the current study was that gender was a significant predictor of academic resilience at age 13 but not at age nine. In this study, boys reported lower levels of emotional symptoms; greater levels of intellectual self-concept, greater hyperactivity and greater educational disengagement; and greater levels of academic resilience at 13 years old. The relationship between gender, social marginalisation and academic achievement warrants further research. Using data from the child cohort, it will be possible to examine if gender differences in academic resilience persist at age 17/18 and beyond the school years (when data is collected at 20 years old). Also, as more than two time points of data collection are now available for the child cohort, it is possible to use Latent Growth Modeling to examine how variables such as the child's self-concept, psychological adjustment, engagement in school and academic achievement may vary by gender and socioeconomic status from nine to 17/18 years old. Such modelling could also examine interaction effects between gender and social, cultural and economic capital throughout child development.

Using data from the GUI study also provides an opportunity to explore the potential influence of the economic crises on children's adjustment, as the first wave of data was collected in the same year that the recession occurred in Ireland. Significant declines in family income and loss of employment between wave one and two could both be considered as indicators of adversity or challenge. Indeed, results from the Programme for International Student Assessment (PISA) indicated that the performance of students in Ireland on assessments of reading and mathematics declined significantly between 2006 and 2009 and that these declines can be at least partially explained by lower levels of engagement among students (Perkins, 2015), which may be in some way related to a change in attitudes as a result of the economic crisis. Also, research by Watson, Maître, Whelan and Williams (2014) found that there was a substantial increase in economic vulnerability for families in the GUI study between waves one and two and that there was a strong association between economic vulnerability and lower levels of socioemotional wellbeing in the GUI child and infant cohorts. Using data from the GUI study the relationship between adversity experienced as a result of the recession and academic achievement could be established. Such analysis would also provide an opportunity to explore the processes associated with academic resilience among those experiencing transitory poverty compared to those who have experienced longer term poverty.

Finally, initiatives such as the School Support Programme under DEIS should be evaluated with reference to the factors and processes identified in the current study. While some preliminary analysis could be conducted using the GUI data (using multi-level modelling), a more focused evaluation of the scheme would provide more in depth information on the practices that DEIS schools are engaging in to improve school outcomes. An evaluation of DEIS has been conducted by the Educational Research Centre since 2007. The main focus of this evaluation has been to examine achievement outcomes among students. If this evaluation is to continue, it should be expanded to include analysis of at least some of the factors identified as being associated with academic resilience in the current study. For example, data on students' self-concept and psychological adjustments should be included, as well as information on children's engagement in school and attitudes towards school. Particular focus should be applied to how schools in receipt of additional resources as part of the DEIS initiative are addressing resilience in their schools (both in terms of academic outcomes and outcomes measuring social and emotional wellbeing). While some analysis has provided examples of good practice across schools (Kavanagh, Weir & Moran, 2017), case studies of particularly effective schools (in terms of improving performance) would contribute towards a framework of academic resilience and could inform educational policy in Ireland.

6.10. Epilogue

The current study tested a model of academic resilience which hypothesized a number of factors and pathways to better academic outcomes among groups of children considered to be at risk of poverty. The factors and processes hypothesised by the model, were based on evidence from the resilience and education literature and included experience of positive family environment; positive relationships with peers and teachers; higher educational expectations; positive attitudes towards and greater involvement in education (by the child and their parent); and personal attributes of the child including positive self-concept and psychological adjustment. Some support was found for this model among 13-year-old children while there was not enough evidence to indicate that the model fit the data well at nine years old.

It was found that the child's self-concept and behavioural adjustment were directly related to academic resilience at age 13, and that self-concept and behavioural adjustment were in turn related to the child having a supportive family environment and a positive relationship with their teacher. The child's engagement in activities outside of school, as well as their level of disengagement from school, also influences their self-concept and behavioural adjustment through the acquisition of new skills. The child's disengagement from school is also related to their relationship with their teacher, their attitudes towards school (which is also associated with a positive relationship with teacher) as well as having parents who are actively involved in their child's education, parents who have greater expectations for their child's educational attainment and greater access to cultural capital such as higher levels of parental education. These findings indicate that academic resilience is the result of interactions among factors from across the whole spectrum of the child's life, including child-specific factors, and these interactions should be considered in terms of the wider context in which they occur.

It is possible that household income may contribute somewhat more to academic resilience at age nine than at age 13 and this may go some way to explaining the less than adequate fit of the model at age nine. The model of academic resilience developed in the current study draws on many factors that can be considered aspects of social and cultural capital and it is possible that the influence of economic capital on academic resilience may diminish over time and that the influence of social and cultural capital may become stronger. The results of the logistic regression analysis (presented in Chapter 4) showed that children with greater levels of social and cultural capital were more likely to be classified as academically resilient at both age levels, indicating that such factors are significant even at age nine. However, as many of the children who demonstrated greater levels of academic resilience at 13 also demonstrated greater levels of academic resilience at age nine, or were performing just below the required cut-off levels (and therefore still performing to high levels), it is likely that these children have experienced greater levels of social and cultural capital from an early age. Just as specific risk factors can be related to other risk factors, protective process can also be associated with other protective processes and experiences can accumulate over time. Therefore, it seems likely that any difference in the experiences of more academically resilient and vulnerable children will become greater as children develop.

Many of the factors and processes that were found to be associated with academic resilience in the current study have also been found to be associated with better educational outcomes among the general population. Therefore it appears that the benefits of these factors and processes are not exclusive to children at risk of poverty. This supports Ann Masten's notion of 'Ordinary Magic'. Masten (2001) notes that results from across various resilience studies points towards a relatively small set of global factors associated with resilience, including connections to competent and caring adults in the family and community, cognitive and self-regulation skills, positive views of self, and motivation to be effective in the environment. As Masten notes, the consistency of these resources in resilience research suggests that fundamental human adaptive systems are at work.

The current study offers a framework to understand the processes that can contribute to academic resilience among children at risk of poverty. However, while the conceptualisation of academic resilience in the models in the current study can be considered to be complex, involving numerous factors and pathways, in many ways these models offer an over-simplification of an immensely complicated and multifaceted area of study that is unlikely to be fully understood through any one study in isolation.

References:

Aitkin, M., Francis, B., & Hinde, J. (2005). *Statistical modelling GLIM 4*. New York: Oxford University Press.

Alva, S. A. (1991). Academic invulnerability among Mexican-American students: The importance of protective resources and appraisals. *Hispanic Journal of Behavioural Science, 13,* 18-34.

Angold, A., Costello, E. J., Messer, S. C., Pickles, A., Winder, F., & Silver, D. (1995) The development of a short questionnaire for use in epidemiological studies of depression in children and adolescents. *International Journal of Methods in Psychiatric Research, 5*, 237 - 249.

Anthony, E. J. (1974) The syndrome of the psychologically vulnerable child. In E. J. Anthony & C. Koupernik (Eds.), The child in his family: Children at psychiatric risk: III. New York: Wiley.

Armsden, G. C. & Greensberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence, 16*, 427 – 54.

Aunola, K., Stattin, H., & Nurmi, J. E. (2000). Parenting style and adolescents' achievement strategies. *Journal of Adolescence, 23*, 205 – 222.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning *Educational Psychologist*, 28, 117-148.

Becker, A., Woerner, W., Hasselhorn, M., Banaschewski, T., & Rothenberger, A. (2004). Validation of the parent and teacher SDQ in a clinical sample. *European Child and Adolescent Psychiatry;13,*:11–16.

Behtoui, A. & Neergaard, A. (2016) Social capital and the educational achievement of young people in Sweden. *British Journal of Sociology of Education*, *37*, 947-969.

Benner, A. D., Boyle, A. E., & Sadler, S. (2016). Parental involvement and adolescents' educational success: The roles of prior achievement and socioeconomic status. *Journal of Youth and Adolescence*, *45*, 1053 - 1064

Bentler, P.M. (1990). Comparative Fit Indexes in Structural Models. *Psychological Bulletin, 107* (2), 238-46.

Bernstein, B. B. (1971). *Class, codes and control: Theoretical studies towards a sociology of language (Vol. 1)*. London, UK: Routledge & Kegan Paul.

Boer, F., & Westenberg, P. M. (1994). The factor structure of the Buss and Plomin EAS Temperament Survey (Parental Ratings) in a Dutch sample of elementary school children. *Journal of Personality Assessment, 62,* 537-551.

Boldt, S., Devine, B., MacDevitt, D., & Morgan, M. (1998). *Educational disadvantage and early school-leaving: Discussion papers.* Dublin: Combat Poverty Agency.

Bornstein, M. H. & Bradley, R. H. (2003). *Socioeconomic status, parenting, and child development*. New Jersey: Lawrence Erlbaum Associates, Inc.

Bourdieu, P. (1986). The forms of capital. In J.E. Richardson (Ed.), *Handbook of theory of research for the sociology of education* (pp. 241 – 258). Westport CT: Greenwood Press.

Bourdieu, P. (2005). *The Social Structures of the Economy*. Oxford: Polity.

Bradley, R. H. & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology, 53*, 371 - 399

Bronfenbrenner, U. (1979). Contexts of child rearing: Problems and prospects. *American Psychologist*, *34,* 844 – 850.

Bronfenbrenner, U. & Evans, G. W. (2000). Developmental science in the 21st century: Emerging questions, theoretical models, research designs and empirical findings. *Social Development*, 9, 115 – 125.

Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology, Vol. 1: Theoretical models of human development* (5th ed., pp. 993 – 1023). New York: Wiley.

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology, Vol. 1: Theoretical models of human development* (6th ed., pp. 793 – 828). New York: Wiley.

Buckner, J. C., Mezzacappa, E., & Beardslee, W. R. (2003). Characteristics of resilient youths living in poverty: The role of self-regulatory processes. *Development and Psychopathology*, *15*, 139–162.

Byrne, B. M. (2012). *Structural Equation Modeling with Mplus: Basic concepts, applications and programming.* East Sussex: Routledge.

Canavan, J. (2008). Resilience: Cautiously welcoming a contested concept. *Child Care in Practice*, 14, 1 – 7.

Caro, D. H., Sandoval-Hernández, A., & Ludtke, O. (2014). Cultural, social, and economic capital constructs in international assessments: an evaluation using exploratory structural equation modeling, *School Effectiveness and School Improvement, 25*, 433 – 450

Catterall, J. S. (1998). Risk and resilience in student transitions to high school*. American Journal of Education, 106*, 302 – 333.

Cicchetti, D. & Garmezy, N. (1993). Prospects and promises in the study of resilience. *Development and Psychopathology, 5,* 497 – 502.

Clark, M. L. (1991). Social identity, peer relations, and academic competence of African American adolescents. Education and Urban Society, 24, 41-52.

Clerkin, A., Perkins, R., & Cunningham. R. (2016). *TIMSS 2015 in Ireland: Mathematics and science in primary and post-primary schools.* Dublin: Educational Research Centre.

Cobb, J. A. (1972). Relationship of discrete classroom behaviors to fourth-grade academic achievement. *Journal of Educational Psychology, 63*, 74–80.

Cooper, C.E. & Crosnoe, R. (2007). The engagement in schooling of economically disadvantaged parents and children. *Youth and Society, 38*, 372-391.

CORI Justice. (2009). *Policy briefing on poverty 2009*. Retrieved 6th July, 2017, from https://www.socialjustice.ie/sites/default/files/attach/publication/2894/policybriefingpoverty09.pdf

Cosgrove, J., Kellaghan, T., Forde, P., & Morgan, M. (2000). *The 1998 National Assessment of English Reading with comparative data from the 1993 National Assessment*. Dublin: Educational Research Centre.

Cosgrove, J., Shiel, G., Sofroniou, S., Zastrutzki, S., & Shortt, F. (2005). *Education for life: The achievements of 15-year-olds in Ireland in the second cycle of PISA*. Dublin: Educational Research Centre.

Crosnoe, R. (2001). Academic orientation and parental involvement in education during high school. *Sociology of Education, 74*, 210 – 230.

Crosnoe, R., Cavanagh, S., & Elder, G. H., Jr. (2003). Economic disadvantage, family dynamics, and adolescent enrolment in higher education. *Journal of Marriage and Family, 64*, 690 – 702.

Darling, N. & Steinburg, L. (1993). Parenting style as context: an integrative model. *Psychological Bulletin, 113,* 487-496

Darling, N. & Toyokawa, T. (1997). *Construction and validation of the parenting styles inventory II (PSI-II).* (Unpublished manuscript).

Department of Education and Science. (2005). *Literacy and Numeracy in Disadvantaged Schools: Challenges for Teacher and Learners. An evaluation by the Inspectorate of the Department of Education and Science*. Dublin: Stationery Office.

Department of Education and Science. (2006). *The Home, School, Community Liaison Scheme in Ireland: From vision to best practice*. Dublin: Stationery Office.

Department of Education and Skills. (2011). *Literacy and numeracy for learning and life: The National Strategy to Improve Literacy and Numeracy Among Children and Young People 2011-2020.* Dublin: Author.

Department of Education and Skills. (2017a). *National strategy: Literacy and numeracy for learning and life 2011-2020.* Dublin: Author.

Department of Education and Skills. (2017b). *DEIS plan 2017*. Stationery Office: Dublin

Department of Health and Children. (1999). *Children First: National Guidelines for the Protection and Welfare of Children.* Dublin: Stationery Office

Department of Housing , Planning and Local Government. (2017). *Homelessness report October 2017*. Dublin: Author. Retrieved 4th December 2017 from http://www.housing.gov.ie/sites/default/files/publications/files/homelessness_report_-_october_2017.pdf

Diamantopoulos, A. & Siguaw, J.A. (2000). *Introducing LISREL.* London: Sage Publications.

Dooley, B., Fitzgerald, A., & Mac Giollabhui, N. (2015) 'The risk and protective factors associated with depression and anxiety in a national sample of Irish adolescents'. *The Irish Journal of Psychological Medicine*, 1 :1-13.

Downes, P. (2007). Why SMART outcomes ain't always so smart. In P. Downes and A. L. Gilligan (Eds.), *Beyond educational disadvantage* (pp. 463 - 491). Dublin: Institute of Public Administration.

Downes, P. (2014). *Access to education in Europe: A framework and agenda for system change.* Dordrecht: Springer.

Downes, P. (2017a). Extended paper: Reconceptualising foundational assumptions of resilience: A cross-cultural, spatial systems domain of relevance for agency and phenomenology in resilience. *The International Journal of Emotional Education, 9*, 99 – 120.

Downes, P. (2017b). New DEIS action plan: Strengths, weaknesses, issues for further consideration. *InTouch, 169*, 46 – 47.

Downes, P. & Gilligan, A. L. (Eds.) (2007). Beyond disadvantange: Some conclusions. In P. Downes, and A. L. Gilligan (Eds.), *Beyond educational disadvantage* (pp. 463 - 491). Dublin: Institute of Public Administration.

Downes, P., Maunsell, C., & Ivers, J. (2006). *A holistic approach to early school leaving and school retention in Blanchardstown: Current issues and future steps for services and schools.* Dublin: Blanchardstown Area Partnership.

Downes, P. & Maunsell, C. (2007). *Count us in. Tackling early school leaving in south west inner city Dublin: An integrated response.* Dublin: South Inner City Community Development Association (SICCDA).

Driscoll, K. & Pianta, R. C. (2011). Mothers' and fathers' perceptions of conflict and closeness in parent-child relationships during early childhood. *Journal of Early Childhood and Infant Psychology, 7*, 1-24.

Duncan, G. J., Yeung, W. J., Brooks-Gunn, J., & Smith, J. R. (1998). How much does childhood poverty affect the life chances of children? *American Sociological Review, 63*, 406 – 423.

Duncan, T. E. & Duncan, S. C. (2009). The ABC's of LGM: An introductory guide to latent variable growth curve modeling. *Social and Personality Psychology Compass, 3,* 979-991

Government of Ireland. (1998). *Education Act*. Dublin: Stationery Office.

Educational Research Centre (ERC). (2007a). *DPRT-R manual*. Dublin: Author.

Educational Research Centre (ERC). (2007b). *DPMT-R manual*. Dublin: Author.

Eivers, E. & Clerkin, A. (2012). *PIRLS & TIMSS 2011: Reading, mathematics and science outcomes for Ireland.* Dublin: Educational Research Centre.

Eivers, E., Close, S., Shiel, G., Millar, D., Clerkin, A., Gilleece., L. & Kiniry, J. (2010). *The 2009 National Assessments of Mathematics and English Reading*. Dublin: Stationery Office.

Eivers, E., Shiel, G., Perkins, R. and Cosgrove, J. (2005). *The 2004 National Assessment of English Reading*. Dublin: Educational Research Centre.

Eivers, E., Shiel, G., & Shortt, F. (2004). *Reading literacy in disadvantaged primary schools.* Dublin: Educational Research Centre.

Economic and Social Research Institute (ESRI). (2010a). *Sample design and response in Wave 1 of the nine-year cohort of Growing Up in Ireland.* Dublin: Author.

Economic and Social Research Institute (ESRI). (2010b). *Guide to the Datasets: Wave 1 of the nine-year cohort of Growing Up in Ireland*. Dublin: ESRI.

European Commission. (2010). Europe 2020: A European strategy for smart, sustainable and inclusive growth. Brussels: Author.

Fergus, S. & Zimmerman, M. A. (2005). Adolescent resilience: A framework for understanding healthy development in the face of risk. *Annual Review of Public Health*, 26, 399 – 419.

Finn, J.D. & Rock, D.A. (1997). Academic success among students at risk for school failure. *Journal of Applied Psychology, 82*, 221-234

Fuligni, A. J., & Eccles, J. S. (1993). Perceived parent-child relationships and early adolescents' orientation towards peers. *Developmental Psychology, 29,* 622–632.

Ganzeboom, H., DeGraaf, P.M., Treiman, D.J., & DeLeeuw, J. (1992). A standard socio-economic index of occupational status. *Social Science Research, 21,* 1-56.

Garmezy N. (1974). The study of competence in children at risk for severe psychopathology. In: E. J. Anthony & C. Koupernik (Eds.), *The child in his family: Children at Psychiatric risk: III*. New York: Wiley.

Garralda, M. E., Yates, P., & Higginson, I. (2000). Child and adolescent mental health service use: HoNOSCA as an outcome measure. *British Journal of Psychiatry, 177*, 52–58.

Gilligan, A. L. (Ed.) (2002). *Primary education: Ending disadvantage. Proceedings and action plan of national forum.* Dublin: Educational Disadvantage Centre, St Patrick's College, Drumcondral

Gilligan, R. (2001). *Promoting resilience: A resource book for work with children in the care system.* London: British Agencies for Adoption and Fostering.

Greenberg, M. T., Weissberg, R. P., O'Brien, M. U., Zins, J. E., Fredericks, L., Resnik, H., et al., (2003). Enhancing school-based prevention and youth development through coordinated social, emotional and academic learning. *American Psychologist*, *58*, 466 – 474.

Greene, S., Williams, J., Doyle E., Harris E., McCrory, C., Murray, A., Quail, A., Swords, L., Thornton M. and Layte, R., O'Dowd, T., Whelan, C.T. (2009). *Growing Up in Ireland – national longitudinal study of children: Review of the literature pertaining to the 9-year cohort.* Dublin: The Stationery Office.

Gonzalez, R., & Padilla, A. M. (1997). The academic resilience of Mexican American high school students. *Hispanic Journal of Behavioral Sciences*, *19*, 301-17.

Good,T. L.,& Beckerman,T. (1978). Time on task: A naturalistic study in sixth-grade classrooms. *Elementary School Journal, 78*, 192–201.

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A Research Note. *Journal of Child Psychology and Psychiatry, 38*, 581-586.

Goodman, R., Ford, T., Richards, H., Gatward, R., & Meltzer, H. (2000). The development and well-being assessment: Description and initial validation of an integrated assessment of child and adolescent psychopathology. *Journal of Child Psychology and Psychiatry, 41*, 645–656.

Goodman, R., Renfrew, D., & Mullick, M. (2000). Predicting type of psychiatric disorder from Strengths and Difficulties Questionnaire (SDQ) scores in child mental health clinics in London and Dhaka. *European Child and Adolescent Psychiatry, 9*, 129–134.

Goodman, R. & Scott, S. (1999). Comparing the Strengths and Difficulties Questionnaire and the Child Behavior Checklist: Is Small Beautiful? *Journal of Abnormal Child Psychology, 27*, 17 – 24.

Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A Very Brief Measure of the Big Five Personality Domains. *Journal of Research in Personality, 37,* 504-528.

Government of Ireland. (2013). *Report on the accounts of the public services 2012*. Dublin: Comptroller and Auditor General.

Grimm, L. G. & Yarnold, P. R. (Eds.) (1995). *Reading and understanding multivariate statistics*. Washigton, DC: American Psychological Association.

Growing Up in Ireland. (2012). *Key findings 13-year-olds, No. 3: The family and financial circumstances of 13-year-olds*. Retrieved on 6th July, 2017 from http://www.esri.ie/pubs/OPEA114.pdf.

Gruen, R. J., Folkman, S., & Lazarus, R. S. (1988). Centrality and individual differences in the meaning of daily hassles. *Journal of Personality*, 56, 743 – 762.

Haas, T. & Pratschke, J. (2012). Optimising the sampling methodology for CSO household surveys: Theoretical considerations and simulation study. Retrieved 6th July, 2017 from http://trutzhaase.eu/wp/wp-content/uploads/R-2012-Optimising-the-Sampling-Methodology-for-CSO-Household-Surveys.pdf.

Harter, S. (2008). The developing self. In W. Damon & R. M. Lerner (Eds.) (2008), *Child and adolescent development: An advanced course.* New Jersey: John Wiley & Sons, Inc.

Harvey, J. & Delfabbro, P. H. (2004). Psychological resilience in disadvantaged youth: A critical overview. *Australian Psychologist*, 39, 30 – 13.

Heckman, J. J. (2006). Skill formation and the economics of investing in disadvantaged children. *Science, 312*, 1900 – 1902.

Holland, A., & Andre, T. (1987). Participation in extracurricular activities in secondary school: What is known, what needs to be known? *Review of Educational Research, 57,* 437 – 466.

Hooper, D., Coughlan J. & Mullen, M. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods*, *6*, 53 – 60.

Hosmer, D. W. & Lemeshow, S. (1989). *Applied logistic regression*. New York: Wiley.

Howard S., Dryden J., & Johnson, B. (1999). Childhood Resilience: review and critique of literature. *Oxford Review of Education, 25*, 307 – 323.

Hu, L. T. & Bentler, P. M. (1999). Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives. *Structural Equation Modeling, 6*, 1-55.

Joint Oireachtas Committee on Education and Skills (2010). *Staying in education: A new way forward. School and out-of-school factors protecting against early school leaving.* Dublin: Stationery Office.

Kaplan, H. B. (1999). Understanding the concept of resilience. In S. Goldstein & R. B. Brooks (Eds.), *Handbook of resilience in children* (pp. 39 – 47). United States: Springer.

Kaufman, J., Cook, A., Arny, L., Jones, B., & Pittinsky, T. (1994). Problems defining resiliency: Illustrations from the study of maltreated children. *Development and Psychopathology*, 6, 215 – 229.

Kavanagh, L., Shiel, G., Gilleece, L. & Kiniry, J. (2015). *The 2014 National Assessments of English Reading and Mathematics. Volume 2: Context Report.* Dublin: Educational Research Centre.

Kavanagh, L., Weir, S., & Moran, E. (2017). *The evaluation of DEIS: Monitoring achievement and attitudes among urban primary school pupils from 2007 to 2016.* Report to the Department of Education and Skills. Dublin: Educational Research Centre.

Kellaghan, T. (2001). Towards a definition of educational disadvantage. *Irish Journal of Education, 32*, 3-22.

Kelly, Y., Fitzgerald, A. & Dooley, B. (2017). Validation of the Resilience Scale for Adolescents (READ) in Ireland: a multi-group analysis. *International Journal of Methods in Psychiatric Research, 26, e1506. doi: 10.1002/mpr.1506.*

Kenny, D. (2015, January 17). *Measuring model fit.* Retrieved 10th July from http://davidakenny.net/cm/fit.htm

King G, McDougall J, DeWit D, Hong S, Miller L, Offord D, et al. (2005). Pathways to children's academic performance and prosocial behaviour: Roles of physical health status, environmental, family, and child factors. *International Journal of Disability, Development and Education, 52,* 313 – 344.

Klasen, H., Woerner, W., Wolke, D., Meyer, R., Overmeyer, S., Kasnitz, W., Rothenberger, A., & Goodman, R. (2000). Comparing the German Versions of the Strengths and Difficulties Questionnaire (SDQ-Deu) and the Child Behaviour Checklist. *European Child and Adolescent Psychiatry 9*, 271 – 276.

Koskelainen, M., Sourander, A. Vauras, M. (2001). Self-reported Strengths and Difficulties in a community sample of Finnish adolescents. *European Child and Adolescent Psychiatry 10*, 180 – 185.

Larson, R., & Richards, M. H. (1991). Daily companionship in late childhood and early adolescence: changing developmental contexts. *Child Development, 62*, 282 – 300.

Lazarus, R. S., DeLongis, A., Folkman, S., & Gruen, R. (1985). Stress and adaptational outcomes: The problem of confounded measures. *American Psychologist*, 40, 770 – 779.

Lazarus, R. S., & Folkman, S. (1987). Transational theory and research on emotions and coping. *European Journal of Personality*, *1,* 141 – 169.

Leech, N. L., Barrett K. C. & Morgan, G. A. (2011). *IBM SPSS for Intermediate Statistics: Use and Interpretation (4th Edition).* Routledge

Liem, A. D. & Martin, A. J. (2011). Peer relationships and adolescents' academic and non-academic outcomes: Same-sex and opposite-sex peer effects and the mediating role of school engagement. *British Journal of Educational Psychology, 81*, 183 – 206.

Lopez Vilaplana, C. (2011). Children at risk of poverty or social exclusion – 2011. Retrieved 5th December 2017 from http://ec.europa.eu/eurostat/statistics-explained/index.php/Archive:Children_at_risk_of_poverty_or_social_exclusion_-_2011.

Lösel, F., Bliesner, T., & Koferl, P. (1989). On the concept of invulnerability: Evaluation and first results if the Bielefeld project. In M. Brambring, F. Lösel & H. Showronek (Eds.), *Children at risk: Assessment, longitudinal research and intervention* (pp. 186 – 219). New York: Walter de Gruyter.

Luthar, S. (1991). Vulnerability and resilience: a study of high-risk adolescents. *Child Development*, 62, 600 – 616.

Luthar, S. (2006). Resilience in development: A synthesis of research across five decades. In D. Cichetti & D. J. Cohen (Eds.), *Developmental psychopathology: Risk, disorder, and adaptation* (pp. 739-795). New York: Wiley.

Luthar, S. S. & Borwn, P. J. (2007). Maximising resilience through diverse levels of inquiry: Prevailing paradigms, possibilities, and priorities for the future. *Development and Psychopathology, 19*, 931 – 955.

Luthar, S.S., & Cicchetti, D. (2000). The construct of resilience: Implications for interventions and social policies. *Development and Psychopathology, 12,* 857 – 885.

Luthar, S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development, 71*, 543–562.

Luthar, S. S., & Cushing, G. (1999). Measurement issues in the empirical study of resilience: An overview. In M. D. Glantz & J. L. Johnson (Eds.), *Resilience and development: Positive life adaptations* (pp. 129 – 160). New York: Plenum.

Luthar, S. S., Cushing, G., Merikangas, K. R., & Rounsaville, B. J. (1998). Multiple Jeopardy: Risk/protective factors among addicted mothers' offspring. *Development and psychopathology*, 10, 117 – 136.

Luthar, S. S., Doernberger, C. H. & Zigler, E. (1993). Resilience is not a unidimensional construct: Insights from a perspective study of inner-city adolescents. *Development and Psychopathology*, 5, 703 – 717.

MacCallum R. C., & Austin, J. T. (2000). Applications of structural equation modelling in psychological research. *Annual Review of Psychology*, 51, 201 – 226.

Martin, A.J. (2004). School motivation of boys and girls: Differences of degree, differences of kind, or both? *Australian Journal of Psychology, 56*, 133-146

Martin, A. J. & Dowson, M. (2009). Interpersonal relationships, motivation, engagement, and achievement: Yields for theory, current issues and educational practice. *Review of Eductional Research, 79,* 327 – 365.

Martin, A.J., & Marsh, H.W. (2006). Academic resilience and its psychological and educational correlates: a construct validity approach. *Psychology in the Schools, 43*, 267 – 281.

Martin, A.J., & Marsh, H.W. (2008). Academic buoyancy: Towards an understanding of students' everyday academic resilience. *Journal of School Psychology, 46,* 53 - 83

Masten, A. S. (1992). Homeless children in the United States: Mark of a nation at risk. *Current Direction in Psychological Science*, 1, 41 – 44.

Masten, A. S. (1994). Resilience in individual development: Successful adaptation despite risk and adversity. In M. C. Wang & E. W. Gordon (Eds.), *Educational resilience in inner-city America: Challenges and prospects* (pp. 3 – 25).

Masten, A. S. (2001). Ordinary Magic: resilience processes in development. *American Psychologist, 56*, 227 – 238.

Masten, A. S. (2006). Promoting resilience in development: A general framework for systems of care. In R. J. Flynn, P. M. Dudding & J. G. Barber, (Eds.), Promoting resilience in child welfare (pp. 3 - 17). Ottawa, ON: University of Ottawa Press.

Masten, A. S. (2009). Ordinary magic: Lessons from research on resilience in human development. *Education Canada, spring, 3*, 8 – 32.

Masten, A. S. (2011). Resilience in children threatened by extreme adversity: Frameworks for research, practice, and translational synergy. *Development and Psychopathology, 23,* 493–506

Masten, A. S. (2015). Pathways to Integrated Resilience Science. *Psychological Inquiry, 26*, 187 – 196.

Masten, A. S., Best, K. M., & Garmezy, N. (1990). Resilience and development: Contributions from the study of children who overcome adversity. *Development and Psychopathology, 2,* 425 – 444.

Masten, A. S., Morison, P., Pelligrini, D., & Tellegen, A. (1990). Competence under stress: Risk and protective factors. In J. Rolf, A. Masten, D. Cicchetti, K. Neuchterlein, & S. Weintraub (Eds.), *Risk and protective factors in development of psychopathology* (pp. 236 – 256). New York: Cambridge University Press.

Masten, A.S., & Narayan. (2012). Child development in the context of disaster, war, and terrorism: Pathways of risk and resilience. *Annual Review of Psychology, 63,* 227 – 57.

McIntosh, C. (2006). Rethinking fit assessment in structural equation modelling: A commentary and elaboration on Barrett (2007). *Personality and Individual Differences, 42*, 859 – 67.

McLoyd, V. (1998). Soocioeconomic disadvantage and child development. *American Psychologist, 53,* 185 – 204.

Murray, A., McCrory, C., Thornton, M., Williams, J. Quail, A., Swords, L., Doyle, E., & Harris, E. (2011). *Growing Up in Ireland: Design, Instrumentation and Procedures for the Child Cohort (at 9 years).* Dublin: Office of the Minister for Children and Youth Affairs

Muthén, L. K. (2001, September 13). *Censored and non-normal data.* Retrieved 10th July 2017 from http://www.statmodel.com/discussion/messages/11/144.html?1459727452.

Muthén, L. K. (2008, April 22). *Fit indices*. Retrieved 10th July 2017 from http://www.statmodel.com/discussion/messages/11/2127.html?1456699299.

Muthén, L. K. & Muthén, B. O. (1998-2010). *Mplus users guide. Sixth Edition*. Los Angeles: Muthén & Muthén.

Nettles, S. M., Mucherah, W., & Jones, D. (2000). Understanding Resilience: The Role of Social Resources. *Journal of Education for Students Placed at Risk*, *5*, 47 – 60

Nickerson, A. B. & Nagle, R. J. (2005). Parent and peer attachment in late childhood and early adolescence. *Journal of Early Adolescence*, 25, 223 – 249.

Nixon, E. (2012). *Growing up in Ireland: How families matter for social and emotional outcomes of 9-year-old children.* Dublin, Department of Health and Children

Nixon, E. & Halpenny, A.M., (2010). *Children's Perspectives on Parenting Styles & Discipline: A Developmental Approach.* Dublin, Government of Ireland.

O'Dougherty-Wright, M., Masten, A. S., Northwood, A., & Hubbard, J. J. (1997). Long-term effects of massive trauma: Developmental and psychobiological perspectives. In D. Cicchetti & S. L. Toth (Eds.), *Rochester Symposium on Developmental Psychopathology: Vol. 8. Developmental perspectives on trauma* (pp. 181 – 225). Rochester, NY: University of Rochester Press.

Organisation for Economic Cooperation and Development (OECD). (2010). *PISA 2009 results: Overcoming social background – Equity in learning opportunities and outcomes (Volume II).* Paris: Author.

Organisation for Economic Cooperation and Development (OECD). (2011). *Against the odds: Disadvantaged students who succeed in school.* Paris: Author

Organisation for Economic Cooperation and Development (OECD). (2015). *The ABC of gender equality in education.* Paris: Author.

Organisation for Economic Cooperation and Development (OECD). (2016). *PISA 2015 results: Excellence and equity in education (Vol. 1)*. Paris: OECD Publishing.

Pallant., J. (2006). *SPSS survival manual: a step by step guide to data analysis using SPSS for Windows*. Berkshire: Open University Press

Pianta, R. C. (1992). Conceptual and methodological issues in research on relationships between children and non-parental adults. In R. C. Pianta (Ed.), *Beyond the parent: The role of other adults in children's lives: New directions for child development* (pp. 121–129). San Francisco, CA: Jossey-Bass Inc.

Peng, S. S., Lee, R. M., Wang, M .C., & Walberg, H. J. (1992). *Resilient students in urban settings*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Perkins, R. (2015). The role of engagement and test-taking behaviour in PISA 2012 in Ireland. *Irish Journal of Education, 40*, 45 – 67.

Perkins, R., & Shiel, G. (2016). *PISA in classrooms: Implications for the teaching and learning of mathematics in Ireland.* Dublin: Educational Research Centre.

Perkins, R., Shiel, G., Merriman, B., Cosgrove, J., & Moran, G. (2013). *Learning for life: The achievements of 15-year-olds in Ireland on mathematics, reading literacy and science in PISA 2012.* Dublin: Educational Research Centre.

Perry, J. D., Guidubaldi, J., & Kehle, T. J. (1979). Kindergarten competencies as predictors of third-grade classroom behaviour and achievement. *Journal of Educational Psychology, 71,* 443 – 450.

Piers, E. V., & *Herzberg*, D. S. (2002). *Piers-Harris Children's Self-Concept Scale-Second Edition Manual.* Los Angeles, CA: Western Psychological Services.

Piers, E.V., & Herzberg, D.S. (2007). *Piers-Harris children's self-concept scale (2nd Ed.).* LA: Western Psychological Services.

Primary Care Reimbursement Service. (2012). *Statistical Analysis of Claims and Payments. Dublin: Health Service Executive*. Retrieved 10th July 2017 at http://www.hse.ie/eng/staff/PCRS/PCRS_Publications/PCRSannreport12.pdf

Quail, Williams, Thornton and Murray (2014).*A summary guide to Wave 2 of the child cohort (at 13 years) of Growing Up in Ireland.*

Quigley, J. & Nixon, E. (2016). Parental investment and child development. In J. Williams, E. Nixon, E. Smyth and D. Watson (Eds.), *Cherishing all children equally? Ireland 100 years on from the Easter Rising.* Cork: Oak tree press.

Raffaelli, M. & Duckett, E. (1989). "We were just talking ...": Conversations in early adolescence. *Journal or Youth and Adolescence, 18,* 567 – 582.

Raubenheimer, J. (2004). An item selection procedure to maximise scale reliability and validity. *SA Journal of Industrial Psychology, 30,* 59 – 64.

Richardson, G. E., Neiger, B. L., Jensen, S., & Kumpfer, K. L. (1990). The Resiliency model. *Health Education*, *21*, 33 – 39.

Ricketts, S. N., Engelhard, G., Jr., & Chang, M. L. (2015). Development and validation of a scale to measure academic resilience in mathematics. *European Journal of Psychological Assessment* 1 – 8.

Richters, J. & Weintraub, S. (1990). Beyond diathesis: Toward an understanding of high-risk environments. In J. Rolf, A. Masten, D. Cicchetti, K. H Neuchterlin and S Weintraub (eds.) *Risk and protective factors in the development of psychopathology*. Cambridge: Cambridge University Press, pp. 67 – 96.

Rigsby, L. (1994). The Americanization of resilience: Deconstructing research practice. In M. Wang and E. Gordon (eds.), *Educational Resilience in Inner -city America: Challenges and Prospects*, pp. 85-92. Hillsdale, NJ: Erlbaum.

Robles, J. (1996). Confirmation Bias in Structural Equation Modeling. *Structural Equation Modeling: A Multidisciplinary Journal, 3,* 73 – 83.

Rosenthal, R. & Jacobson, L. (1968). *Pygmalion in the classroom.* New York Holt: Reinhart and Winston

Rubie-Davis, C. M. (2006). Teacher expectations and student self-perceptions: Exploring relationships. *Psychology in the Schools, 43*, 537 – 552.

Rubie-Davis, C. M. (2010). Teacher expectations and perceptions of student attributes: Is there a relationship? *British Journal of Educational Psychology, 80*, 121 – 135.

Rutter, M. (1979) Protective factors in children's responses to stress and disadvantage. In: M. W. Kent & J. E. Rolf (Eds), *Primary prevention in psychopathology: Social competence in children. Vol. 8,* pp. 49–74. Hanover, NH: University Press of New England,.

Rutter, M. (1981). Stress, coping and developement – some issues and some questions. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 22*, 323 – 56.

Rutter, M. (1985). Resilience in the face of adversity: Protective factors and resistance to psychiatric disorder. *British Journal of Psychiatry, 147,* 598 – 611.

Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry, 57*, 316 – 331.

Rutter, M. (1990). Psychosocial resilience and protective mechanism. In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 257-280). New York: Cambridge University Press

Rutter, M. (2000). Resilience reconsidered: Conceptual considerations, empirical findings, and policy implications. In J. P. Shonkoff & S. J. Meisels (Eds.). *Handbook of early childhood intervention* (2nd ed., pp. 651 – 682). New York: Cambridge University Press.

Rutter, M. (2006). Implications of resilience concepts for scientific understanding. *Annals of the New York Academy of Sciences, 1094*, 1 – 12.

Rutter, M. (2012). Resilience as a dynamic concept. *Development and Psychopathology, 24,* 335 – 344.

Sacker, A. & Schoon, I. (2006). Educational resilience in later life: Resources and assets in adolescence and return to education after leaving school at age 16. *Social Science Research*, 36, 873 – 896.

Schoon, I. (2006). *Risk and resilience: Adaptations in changing times.* Cambridge: Cambridge University Press.

Schoon, I., Jones, E., Cheng, H., & Maughan, B. (2012). Family hardship, family instability, and cognitive development. *Journal of Epidemiology and Community Health, 66*, 716 – 722.

Schoon, I., Parsons, S., and Sacker, A. (2004). Socio-economic adversity, educational resilience, and subsequent levels of adult adaptation. *Journal of Adolescent Research*, *19;* 383 – 404.

Seginar, R. (1983). Parents' education expectations and children's academic achievements: A literature review. *Merrill-Palmer Quarterly, 29*, 1 – 23.

Shiel, G., Kavanagh, L., & Millar, D. (2014). *The 2014 National Assessments of English Reading and Mathematics. Volume 1: Performance report*. Dublin: Educational Research Centre.

Shiel, G., Kelleher, C., McKeown, C., & Denner, S. (2016). *Future ready? The performance of 15-year-olds in Ireland on science, reading literacy and mathematics in PISA 2015.* Dublin: Educational Research Centre.

Sirin, S. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, *75*, 417 – 53.

Smith, J. R., Brooks-Gunn, J., & Klebanov, P. (1997). The consequences of living in poverty for young children's cognitive and verbal ability and early school achievement. In G.J. Duncan & J. Brooks-Gunn (Eds.), *Consequences of growing up poor*. New York: Russell Sage Found.

Social Justice Ireland (2013). *Who really took the hit during Ireland's bailout?* Retrieved on 6th July, 2017 from https://www.socialjustice.ie/sites/default/files/attach/publication/2901/2013-12-02-whoreallytookthehitsduringirelandsbailout.pdf

Sofroniou, N., Archer, P., & Weir, S. (2004). An analysis of the association between socioeconomic context, gender and achievement. *Irish Journal of Education, 35,* 58 – 72.

Spring, N. (2007). Tracing the language of educational disadvantage. In P. Downes and A. L. Gilligan (Eds.), *Beyond educational disadvantage* (pp. 463 - 491). Dublin: Institute of Public Administration.

Sroufe, L. A., Egeland, B., Carlson, E. A., & Collins, W. A. (2005*). The development of the person: The Minnesota study of risk and adaptation from birth to adulthood*. New York, NY: Guilford.

Stattin H. & Kerr, M. (2000). Parental Monitoring: A Reinterpretation. *Child Development, 71*, 1072 – 1085.

Steiger, J H., & Lind, J. C. (1980, June). *Statistically based tests for the number of common factors.* Paper presented at the Psychometric Society annual meeting, Iowa City, IA.

Steinberg, L., Brown, B., & Dornbusch, S. (1996). *Beyond the classroom: Why school reform has failed and what parents need to do.* New York: Simon & Schuster.

Stride, C (2015). *Structural Equation Modelling using Mplus.* Unplublished manual to accompany Mplus training course, www.figureitout.org.uk

Tabachnick, B. G. & Fidell, L. S. (2014). Logistic regression. In B. G. Tabachnick & L. S. Fidell (Eds.), *Using Multivariate Statistics* (6th ed., pp. 483 – 554). Essex: Pearson Education Limited.

Tanaka, J.S. (1993). Multifaceted conceptions of fit in structural equation models. In K.A. Bollen, & J.S. Long (eds.), *Testing structural equation models.* Newbury Park, CA: Sage.

Thompson, B. (2000). Ten commandments of structural equation modeling. In L. G. Grimm and P. R. Yarnold (Eds.), *Reading and Understanding more Multivariate Statistics*, pp. 261 – 284. Washington DC: American Psychological Association.

Thornton, M., Williams, J., McCrory, C., Murray, A., & Quail, A. (2016). *Growing Up in Ireland: Design, Instrumentation and Procedures for the Child Cohort (13 years).* Dublin: Office of the Minister for Children and Youth Affairs

Tudge, J. R. H. (2016). Implicit versus explicit ways of using Bronfenbrenner's bioecological theory. *Human Development, 59,* 195 – 199.

Tudge, J. R. H, Mokrova, I., Hatfield, B. E. & Karnik, R. B. (2009). Uses and misuses of Bronfenbrenner's bioecological theory of human development. *Journal of family theory and review*, 1, 198 – 210.

Ullman, J. (2014). Structural Equation Modeling. In B. G. Tabachnick. & L. S. Fidell in *Using Multivariate Statistics* (6th ed., pp. 731 – 836). Essex: Pearson Education Limited.

Ungar, M. (2012). Social ecologiesand their contribution to resilience. In M. Ungar (Ed.), *The social ecology of resilience: A handbook of theory and practice* (pp. 13 - 32). New York, NY: Springer.

Ungar, M., Ghazinour, M. & Richter, J. (2013). Annual research review: What is resilience within the social ecology of human development? *The journal of child psychology and psychiatry, 54*, 348 – 366.

Urhahne, D. (2015). Teacher behavior as a mediator of the relationship between teacher judgment and students' motivation and emotion. *Teaching and Teacher Education, 45,* 73 – 82.

Vanderbilt-Adraince, E. & Shaw, D. (2006). Neighborhood Risk and the Development of Resilience. *Annals of the New York Academy of Sciences, 1094*, 359 – 362.

von Stumm, S. (2017). Socioeconomic status amplifies the achievement gap throughout compulsory education independent of intelligence. *Intelligence, 60,* 57 - 62

Wang, M.C., Haertal, G.D., & Wahlberg, H.J. (1994). Educational resilience in inner cities. In M.C. Wang & E.W. Gordon (Eds.), *Educational resilience in inner-city America: challenges and prospects,* pp. 45-72. Hillsdale, NJ: Erlbaum.

Wang, M. C., Haertal., G. D., &Walberg, H. J. (1995). *Educational Resilience: An emergent construct.* Philadelphia: National Centre on Education in Inner Cities.

Watson, D., Maître, B., Whelan, C. T. & Williams, J. (2014). *Dynamics of child economic vulnerability and socio-emotional development: An analysis of the first two waves of the Growing Up in Ireland study.* Dublin: The Stationery Office.

Waxman, H.C., Gray, J.P., & Padron, Y. N. (2003). *Review of Research on Educational Resilience.* California: Centre for Research on Education, Diversity & Excellence.

Waxman, H. C., & Huang, S. L. (1996). Motivation and learning environment differences between resilient and non-resilient inner-city middle school students. *Journal of Educational Research*, *90*, 93-102.

Waxman, H. C., Huang, S. L., & Wang, M. C. (1997). Investigating the multilevel classroom learning environment of resilient and non-resilient students from inner-city elementary schools. *International Journal of Educational Research, 27*, 343-53.

Weare, K., & Gray, G. (2003). *What works in developing children's emotional and social competence and wellbeing?* London: HMSO.

Weir, S. (2001). The reading achievements of primary school pupils from disadvantaged backgrounds. *Irish Journal of Education, 32*, 23 – 43

Weir, S. (2016). Raising achievement in schools in disadvantaged areas. In S. Edgar (Ed.). *Successful approaches to raising attainment and tackling inequity: CIDREE Yearbook 2016.* Livingston: Education Scotland.

Weir, S., & Archer, P. (2005). A review of procedures to select schools for support to deal with educational disadvantage. *Irish Journal of Education, 36,* 63 – 85.

Werner, E. (2000). Protective factors and individual resilience. In J. P. Shonkoff, & S. J. Meisels (Eds.), *Handbook of early intervention* (2nd edition), pp. 115 – 132. New York, NY: Cambridge University Press.

Werner, E. E., Bierman, J M. & French, F. E. (1971). *The children of Kauai: A longitudinal study from the prenatal period to age ten*. Honolulu: University of Hawaii Press.

Wheaton, B., Muthen, B., Alwin, D., F., & Summers, G. (1977*).* Assessing Reliability and Stability in Panel Models*, Sociological Methodology*, *8*, 84 – 136.

Whelan, C.T. & Maître, B. (2014). The great recession and the changing distribution of economic vulnerability by social class: The Irish case. *Journal of European Social Policy, 24*, 5

White, K. R. (1982). The relation between socioeconomic status and academic achievement. *Psychological Bulletin, 91*, 461 – 481.

Williams, B., Williams, J. & Ullman, A. (2002). *Parental involvement in education*. Norwich: Controller of Her Majesty's Stationery Office

Williams, J., Greene, S., Doyle, E., Harris, E., Layte, R., McCoy, S., McCrory, C., Murray, A., Nixon, E., O'Dowd, T., O'Moore, M. Quail, A., Smyth, E. Swords, L. & Thornton, M. (2009). *Growing Up in Ireland: The lives of 9-year-olds.* Dublin: Office of the Minister for Children and Youth Affairs.

Williams, J., Nixon, E., Smyth, E., & Watson, D. (2016). *Cherishing all children equally? Ireland 100 years on from the Easter Rising.* Cork: Oak tree press.

Wolin, S. J., & Wolin, S. (1993). *The resilient self: How survivors of troubled families rise above adversity.* New York: Villard.

Yu, C. Y. (2002) *Evaluating cutoff criteria of model fit indices for latent variable models with binary and continuous outcomes*. Unpublished doctoral dissertation, University of California, Los Angeles. Retrieved 10th July 2017 from https://www.statmodel.com/download/Yudissertation.pdf

Zimmerman, M.A., Stoddard, S. A, Eisman, A. B., Caldwell, C.H., Aiyer, S.M., & Miller, A. (2013). Adolescent Resilience: Promotive Factors That Inform Prevention. *Child Development Perspectives*, *7*, 215 – 220 DOI: 10.1111/cdep.12042

Zins, J. E., Weissberg, R. P., Wang, M. C., & Walberg, H. J. (2004). *Building academic success on social and emotional learning*. New York, NY: Teachers' College Press.

Zucker, R. A., Wong, M. W., Puttler, L. I., & Fitzgerald, H. E. (2003). Resilience and vulnerability among sons of alcoholics: Relationship to developmental outcomes between early childhood and adolescence. In S. S. Luthar (Ed.), *Resilience and vulnerability: Adaptation in the context of childhood adversities,* pp. 76 – 103. New York: Cambridge University Press.

Appendix A: Ancillary tables for Chapter 3

Table A3.1: Strengths and Difficulties Questionnaire (Goodman, 1997)

Codes:	Not true	Somewhat true	Certainly true
Emotional problems scale:			
Often complains of headaches, stomach-aches or sickness	0	1	2
Many worries, often seems worried	0	1	2
Often unhappy, down-hearted or tearful	0	1	2
Nervous or clingy in new situations, easily loses confidence	0	1	2
Many fears, easily scared	0	1	2
Conduct problems scale:			
Often has temper tantrums or hot tempers	0	1	2
Generally obedient, usually does what adults request	2	1	0
Often fights with other children or bullies them	0	1	2
Often lies or cheats	0	1	2
Steals from home, school or elsewhere	0	1	2
Hyperactivity scale:			
Restless, overactive, cannot stay still for long	0	1	2
Constantly fidgeting or squirming	0	1	2
Easily distracted, concentration wanders	0	1	2
Thinks things out before acting	2	1	0
Sees tasks through to the end, good attention span	2	1	0
Peer problems scale:			
Rather solitary, tends to play alone	0	1	2
Has at least one good friend	2	1	0
Generally liked by other children	2	1	0
Picked on or bullied by other children	0	1	2
Gets on better with adults than with other children	0	1	2
Prosocial scale:			
Considerate of other people's feelings	0	1	2
Shares readily with other children (treats, toys, pencils etc.)	0	1	2
Helpful if someone is hurt, upset or feeling ill	0	1	2
Kind to younger children	0	1	2
Often volunteers to help others (parents, teachers, other children)	0	1	2

Table A3.2: The Emotionality, Activity and Sociability Temperament Scale (EAS)

	Not characteristic	Occasionally characteristic	Somewhat characteristic	Characteristic	Very characteristic
Emotionality:					
Cries easily	0	1	2	3	4
Tends to be somewhat emotional	0	1	2	3	4
Often fusses and cries	0	1	2	3	4
Gets upset easily	0	1	2	3	4
Reacts intensely when upset	0	1	2	3	4
Activity:					
Is always on the go	0	1	2	3	4
Tends to move slowly	4	3	2	1	0
Off and running as soon as he/she wakes	0	1	2	3	4
Is very energetic	0	1	2	3	4
Prefers quiet, inactive games to more active ones	4	3	2	1	0
Shyness:					
Tends to be shy	0	1	2	3	4
Makes friends easily	4	3	2	1	0
Is very sociable	4	3	2	1	0
Takes a long time to warm up to strangers	0	1	2	3	4
Is very friendly with strangers	4	3	2	1	0
Sociability:					
Likes to be with people	0	1	2	3	4
Prefers playing with others to playing alone	0	1	2	3	4
Finds people more stimulating than anything else	0	1	2	3	4
Is something of a loner	4	3	2	1	0
When alone, child feels isolated	0	1	2	3	4

Table A3.3: Parenting Style Inventory II (Darling & Toyokawa, 1997)

	Always	Sometimes	Never
Responsiveness Subscale:			
My mother doesn't really like me to tell her my troubles.	3	2	1
My mother hardly ever praises me for doing well.	3	2	1
I can count on my mother to help me out if I have a problem.	1	2	3
My mother spends time just talking to me.	1	2	3
My mother and I do things that are fun together.	1	2	3
Autonomy-granting Subscale:			
My mother tells me that her ideas are correct and that I shouldn't question them.	3	2	1
My mother respects my privacy.	1	2	3
My mother gives me a lot of freedom.	1	2	3
My mother makes most of the decisions about what I can do.	3	2	1
My mother believes I have a right to my own point of view.	1	2	3
Demandingness Subscale			
My mother really expects me to follow family rules.	1	2	3
My mother really lets me get away with things.	3	2	1
If I don't behave myself, my mother will punish me.	1	2	3
My mother points out ways I could do better.	1	2	3
When I do something wrong, my mother does not punish me.	3	2	1

Table A3.4: Pianta Child-Parent Relationship Scale (CPR-S; Pianta 1992)

	Definitely does not apply	Not really	Neutral, not sure	Applies somewhat	Definitely applies
Conflict scale:					
Seem to be struggling with each other	1	2	3	4	5
Uncomfortable with physical affection	1	2	3	4	5
Easily becomes angry with me	1	2	3	4	5
Feels I treat him unfairly*	1	2	3	4	5
Sees parent as a source of punishment*	1	2	3	4	5
Hurt when parent spends time with other child*	1	2	3	4	5
Remains angry after discipline	1	2	3	4	5
When my child is misbehaves, he/she responds to look or tone of voice.*	5	4	3	2	1
Child does not want to accept help when he/she needs it.*	1	2	3	4	5
Dealing with my child drains my energy	1	2	3	4	5
Bad mood, long and difficult day	1	2	3	4	5
Feelings can be unpredictable	1	2	3	4	5
Parent uncomfortable with how child and parent get along*	1	2	3	4	5
Child whine when wants something*	1	2	3	4	5
Sneaky or manipulative	1	2	3	4	5
Closeness scale:					
An affectionate relationship	1	2	3	4	5
Will seek comfort from me if upset	1	2	3	4	5
Values his/her relationship with me	1	2	3	4	5
Praise, beams with pride	1	2	3	4	5
Spontaneously shares information	1	2	3	4	5
Child tries to please parent*	1	2	3	4	5
Copies behaviour*	1	2	3	4	5
Easy to tune in to child's feelings	1	2	3	4	5
Openly shares feelings and experiences	1	2	3	4	5
Feels effective and confident*	1	2	3	4	5
Dependence scale*:					
Appears hurt when corrected	1	2	3	4	5
Reacts strongly to separation	1	2	3	4	5
Overly dependent	1	2	3	4	5
Asks for help when doesn't need it	1	2	3	4	5
Think about child when not together	1	2	3	4	5

*Wave one only

Table A3.5: Parental monitoring and child disclosure (Stattin & Kerr, 2000)*

Parental monitoring scale: Do your parents:	Almost never/ never	Not very often	Sometimes	Often	Almost always or always
Know what you do during your free time?					
Know who you have as friends during your free time?					
Usually know what type of homework you have?					
Know what you spend your money on?					
Usually know when you have an exam or paper due at school?					
Know how you do in different subjects at school?					
Know where you go when you are out with friends at night?					
Normally know where you go and what you do after school?					
In the last month, have your parents ever had no idea of where you were at night?					
Child disclosure scale:					
Do you spontaneously tell your parents about your friends?					
How often do you usually want to tell your parents about school?					
Do you keep a lot of secrets from your parents about what you do during your free time?					
Do you hide a lot from your parents about what you do during nights and weekends?					
Do you like to tell your parents about what you did and where you went during the evening?					
Parental control scale:					
Must you have your parents' permission before going out during weeknights					
If you go out on a Saturday evening, must you inform your parents beforehand about who will be along as well as where you will be going?					
If you have been out past curfew, do your parents require that you explain why and tell who you were with?					
Do your parents demand that they know where you are in the evenings, who you are going to be with and what you going to do?					
Must you ask your parents before you can make plans with friends about what you will do on a Saturday night?					
Do your parents require that you tell them how you spend your money?					

*details on reverse coding not available

Table A3.6: Ten Item Personality Inventory (TIPI; Gosling, Rentfrow & Swann, 2003)

I see myself as:	Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly
Extraversion:							
Extraverted, enthusiastic	1	2	3	4	5	6	7
Reserved, quiet	7	6	5	4	3	2	1
Agreeableness:							
Critical, quarrelsome	7	6	5	4	3	2	1
Sympathetic, warm	1	2	3	4	5	6	7
Conscientiousness:							
Dependable, self-disciplined	1	2	3	4	5	6	7
Disorganized, careless	7	6	5	4	3	2	1
Emotional stability:							
Anxious, easily upset	7	6	5	4	3	2	1
Calm, emotionally stable	1	2	3	4	5	6	7
Openness to experience:							
Open to new experiences, complex	1	2	3	4	5	6	7
Conventional, uncreative	7	6	5	4	3	2	1

Table A3.7: The Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987)

	Almost never/ never	Not very often	Sometimes	Often	Almost always or always
Talking over my problems with friends makes me feel ashamed or foolish.	1	2	3	4	5
I wish I had different friends.	1	2	3	4	5
My friends understand me.	1	2	3	4	5
My friends accept me as I am.	1	2	3	4	5
I feel the need to be in touch with my friends more often.	1	2	3	4	5
My friends don't understand what I'm going through these days.	1	2	3	4	5
I feel alone or apart when I am with my friends.	1	2	3	4	5
My friends listen to what I have to say.	1	2	3	4	5
I feel my friends are good friends.	1	2	3	4	5
My friends are fairly easy to talk to.	1	2	3	4	5
When I am angry about something, my friends try to be understanding.	1	2	3	4	5
I feel angry with my friends.	1	2	3	4	5
I can count on my friends when I need to get something off my chest.	1	2	3	4	5
I trust my friends.	1	2	3	4	5
My friends respect my feelings.	1	2	3	4	5
I get upset a lot more than my friends know about.	1	2	3	4	5
It seems as if my friends are irritated with me for no reason.	1	2	3	4	5

Table A3.8: The Short Mood and Feelings Questionnaire (Angold & Costello, 1987)

	Not true	Sometimes true	True
I felt miserable or unhappy	0	1	2
I didn't enjoy anything at all	0	1	2
I felt so tired I just sat around and did nothing.	0	1	2
I was very restless.	0	1	2
I felt I was no good anymore.	0	1	2
I cried a lot.	0	1	2
I found it hard to think properly or concentrate.	0	1	2
I hated myself.	0	1	2
I was a bad person.	0	1	2
I felt lonely.	0	1	2
I thought nobody really loved me.	0	1	2
I thought I could never be as good as other kids.	0	1	2
I did everything wrong.	0	1	2

Table A3.9: Correlation matrix for the variables that measure who the study child talks to when they have a problem (wave one)

	Mother	Father	Mother's partner	Dad's partner	Other relative
Mother	-	.156	.002	.018	-.016
Father		-	.049	.088	.067
Mother's partner			-	.684	.075
Dad's partner				-	.087
Other relative					-

Table A3.10: Correlation matrix for the variables that measure teachers' ratings of children' performance (wave one)

	Reading	Writing	Comprehension	Mathematics	Imagination/ creativity	Oral communication	Problem solving
Reading	-	.748	.804	.618	.551	.601	.633
Writing		-	.748	.614	.560	.564	.625
Comprehension			-	.693	.609	.646	.713
Mathematics				-	.529	.542	.802
Imagination/ creativity					-	.634	.579
Oral communication						-	.599
Problem solving							-

Table A3.11: Component matrix for principal components analysis on the seven variables measuring teachers' ratings of study child's school performance (wave one)

Variable	Factor loading
Rating of comprehension	0.901
Rating of reading	0.856
Rating of problem solving	0.853
Rating of writing	0.838
Rating of mathematics	0.825
Rating of oral communications	0.782
Rating of imagination/creativity	0.758

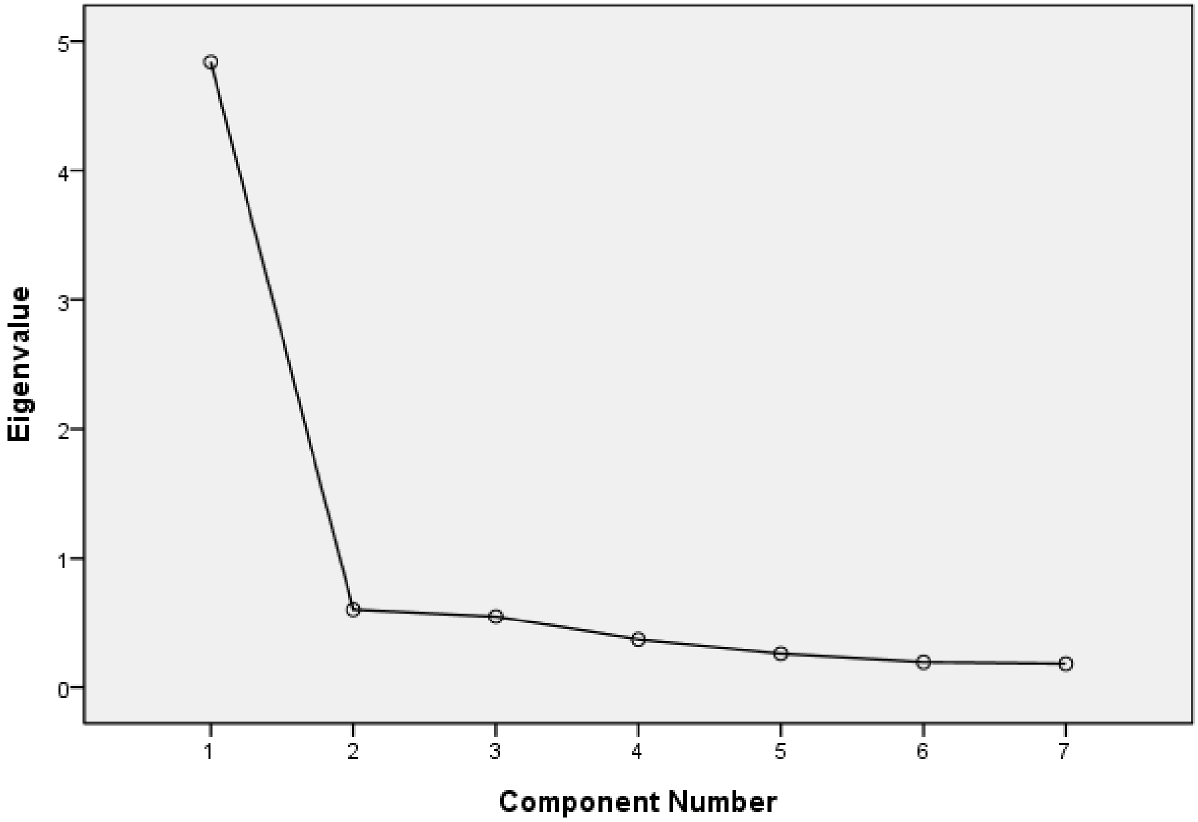

Figure A3.1: Scree plot of the teachers' ratings of the children' performance components (wave one)

Table A3.12: Correlation matrix for the variables that measure the study child's daily leisure activities (wave one)

	Time watching TV/video/DVD	Time reading for pleasure	Time using a computer	Time playing video games
Time watching TV/video/DVD	-	.145	.129	.270
Time reading for pleasure		-	.138	.046
Time using a computer			-	.174
Time playing video games				-

Table A3.13: Correlation matrix for the variables that measure the study child's extracurricular activities (wave one)

	Sport/ fitness club	Cultural activities	Youth club	Scouts/ guides	Homework club	Other activity
Sport/fitness club	-	.061	-.024	.040	-.091	-.051
Cultural activities		-	-.009	.073	-.024	.027
Youth club			-	.007	.145	.013
Scouts/guides				-	-.038	.025
Homework club					-	.031
Other activity						-

Table A3.14: Correlation matrix for the variables that measure the study child's engagement with family (child report, wave one)

	Eat together	Visited relations	Watch TV	Chat	Went to park	Gone swimming	Played games at home	Played games outside	Read something together
Eat together	-	.047	.022	.070	.006	.017	.028	.048	.050
Visited relations		-	.071	.039	.087	.040	.065	.077	.034
Watch TV			-	.072	.022	.029	.056	.060	.066
Chat				-	.028	-.006	.037	.030	.065
Went to park					-	.137	.083	.158	.071
Gone swimming						-	.082	.094	.072
Played games at home							-	.228	.156
Played games outside								-	.084
Read something together									-

Table A3.15 Correlation matrix for the variables that measure the study child's engagement with family (parent report; wave one)

	Eat together	Play sports	Talk about things	Household activities	Go on outings
Eat together	-	.145	.214	.165	.085
Play sports		-	.143	.184	.206
Talk about things			-	.195	.121
Household activities				-	.206
Go on outings					-

Table A3.16: Correlation matrix for the variables that measure time spent with extended family (wave one)

	Grandparents	Uncles/aunts	Cousins
Grandparents	-	.399	.312
Uncles/aunts		-	.673
Cousins			-

Table A3.17: Correlation matrix for the variables that measure time spent with extended family (wave two)

	Grandparents	Uncles/aunts	Cousins	Other family
Grandparents	-	.431	.363	.255
Uncles/aunts		-	.699	.427
Cousins			-	.436
Other family				-

Table A3.18: Component matrix for principal components analysis on the three variables measuring time spent with extended family (wave one)

Variable	Factor loading
Time spent with uncles and aunts	0.887
Time spent with cousins	0.851
Time spent with grandparents	0.657

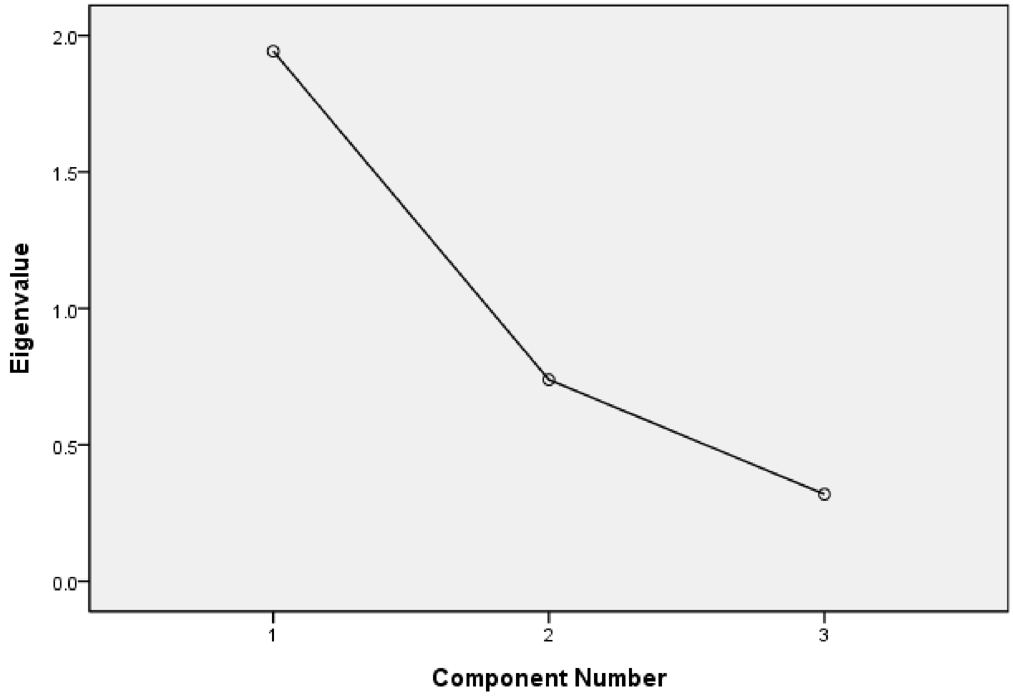

Figure A3.2: Scree plot of the study child's engagement with extended family components (wave one)

Table A3.19: Component matrix for principal components analysis on the four variables measuring time spent with extended family (wave two)

Variable	Factor loading
Time spent with uncles and aunts	0.866
Time spent with cousins	0.848
Time spent with other family	0.676
Time spent with grandparents	0.639

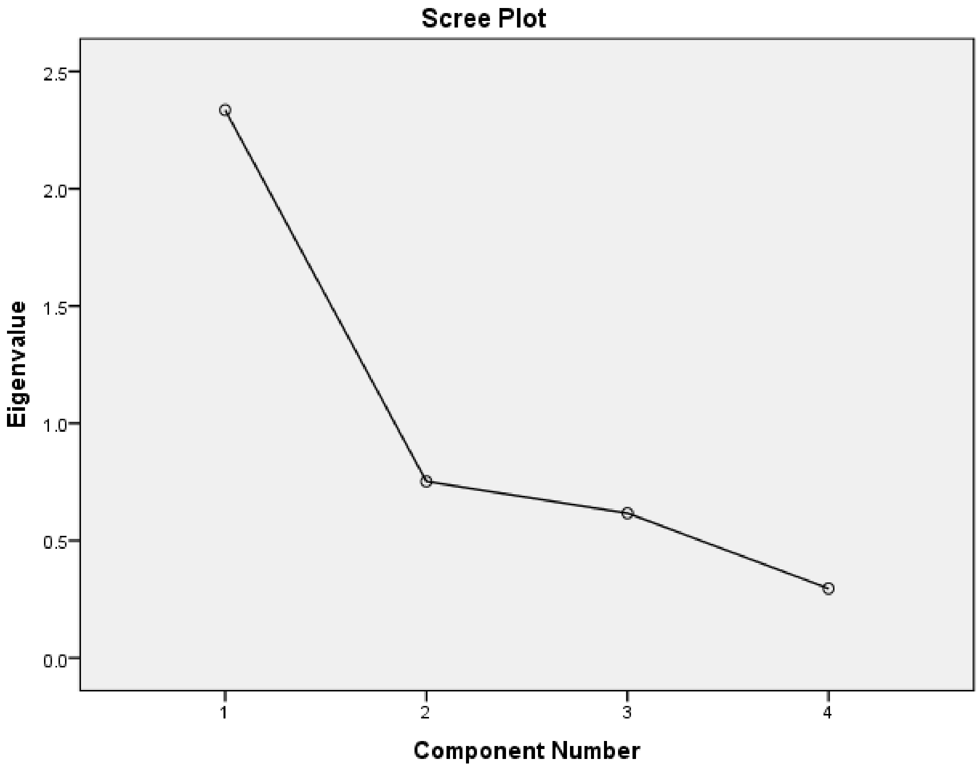

Figure A3.3: Scree plot of the study child's engagement with extended family components (wave two)

Table A3.20: correlation matrix – disengagement with school (wave two)

	I was late for school	I got into trouble for not following school rules	I skipped classes or mitched.	I 'messed' in class	I had to do extra work as punishment (including lines)	I had to do detention (after school or at lunch-time)	I was suspended from school
I was late for school	-	.280	.151	.246	.227	.238	.118
I got into trouble for not following school rules		-	.288	.566	.473	.452	.230
I skipped classes or mitched.			-	.231	.237	.325	.264
I 'messed' in class				-	.451	.359	.179
I had to do extra work as punishment (including lines)					-	.467	.212
I had to do detention (after school or at lunch-time)						-	.341
I was suspended from school							-

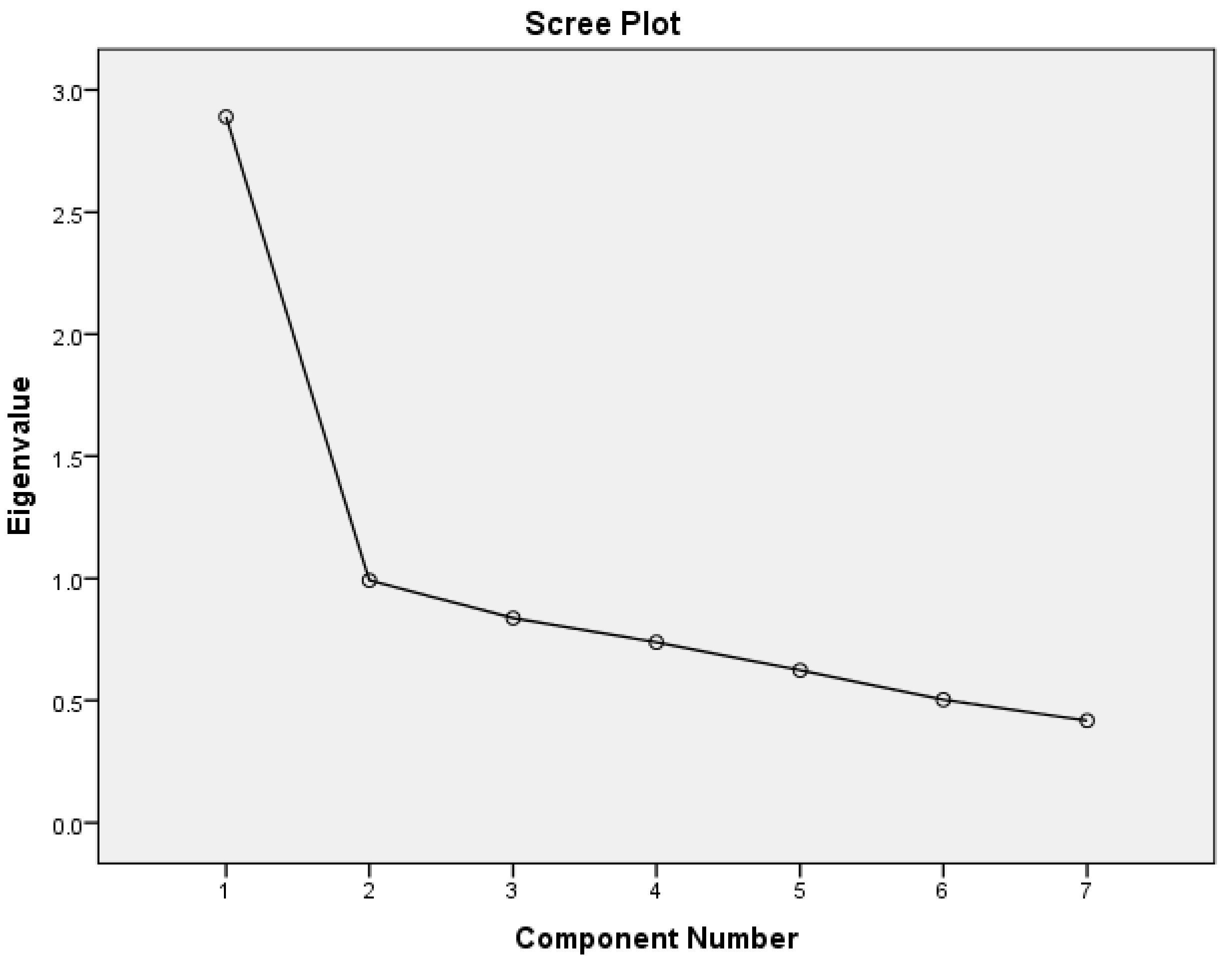

Figure A3.4: scree plot disengagement from school (wave two)

Table A3.21: Component matrix for principal components analysis on the seven variables measuring the study child's disengagement from school (wave two)

Variable	Factor loading
I was late for school	.459
I got into trouble for not following school rules	.777
I skipped classes or mitched.	.526
I 'messed' in class	.714
I had to do extra work as punishment (including lines)	.722
I had to do detention (after school or at lunch-time)	.734
I was suspended from school	.478

Appendix B: Ancillary tables for Chapter 4

Table A4.1: Expected and observed count for each occupational category, by medical card status (wave one)

		Medical Card		
		All other students	Full medical card	Total
Professional/Manager	Count	3134	326	3460
	Expected Count	2754.0	706.0	3460.0
Non-manual/Skilled	Count	2218	752	2970
	Expected Count	2364.0	606.0	2970.0
Semi-skilled/unskilled	Count	488	419	907
	Expected Count	721.9	185.1	907.0
Total	Count	5840	1497	7337
	Expected Count	5840.0	1497.0	7337.0

Table A4.2: Expected and observed count for each occupational category, by medical card status at age 13

		Medical Card		
		All other students	Full medical card	Total
Professional/Manager	Count	2825	431	3256
	Expected Count	2322.7	933.3	3256.0
Non-manual/Skilled	Count	1420	954	2374
	Expected Count	1693.5	680.5	2374.0
Semi-skilled/unskilled	Count	354	463	817
	Expected Count	582.8	234.2	817.0
Total	Count	4599	1848	6447
	Expected Count	4599.0	1848.0	6447.0

Table A4.3: Expected and observed count for each occupational category, by resilience status (wave one)

		Resilience status				
		Non-medical card	Resilient	Vulnerable	Other	Total
Professional/ Manager	Count	3134	57	70	198	3459
	Expected Count	2753.6	79.2	247.1	379.1	3459.0
Non-manual/ Skilled	Count	2218	82	290	380	2970
	Expected Count	2364.3	68.0	212.1	325.5	2970.0
Semi-skilled/ unskilled	Count	488	29	164	226	907
	Expected Count	722.0	20.8	64.8	99.4	907.0
Total	Count	5840	168	524	804	7336
	Expected Count	5840.0	168.0	524.0	804.0	7336.0

Table A4.4: Expected and observed count for each occupational category, by resilience status (wave two)

		Resilience status				
		Non-medical card	Resilient	Vulnerable	Other	Total
Professional/ manger	Count	2825	55	134	242	3256
	Expected Count	2323.0	92.4	355.6	484.9	3256.0
Non-manual/ skilled	Count	1420	97	352	505	2374
	Expected Count	1693.8	67.4	259.3	353.6	2374.0
semi-skilled/ unskilled	Count	354	31	218	213	816
	Expected Count	582.2	23.2	89.1	121.5	816.0
Total	Count	4599	183	704	960	6446
	Expected Count	4599.0	183.0	704.0	960.0	6446.0

Table A4.5: Odds ratios and significance tests for each variable measuring background characteristics tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Gender	Female-male	0.597	(0.362, 0.985)	0.043
Equivalised income		2.064	(1.098, 3.880)	0.024
Proportion of income from welfare	None – 100%	1.893	(0.315, 11.369)	0.485
	Less than 50% – 100%	2.610	(1.241, 5.486)	0.011
	50 to 99.9% – 100%	2.277	(0.928, 5.584)	0.072
Household social class	Skilled – professional/manager	0.244	(0.115, 0.521)	0.000
	Unskilled – professional/manager	0.146	(0.057, 0.371)	0.000
Highest level of education of parents	Primary – degree/post-grad	0.022	(0.004, 0.112	0.000
	Lower secondary – degree/post grad.	0.082	(0.033, 0.202)	0.000
	Upper secondary - degree/post grad.	0.206	(0.097, 0.434)	0.001
	Non-degree - degree/post grad.	0.375	(0.168, 0.836)	0.016

Table A4.6: Odds ratios and significance tests for each variable measuring background characteristics tested separately at age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
gender	Female-male	0.403	(0.270, 0.602)	0.000
Equivalised income		1.000	(1.000, 1.000)	0.050
Proportion of income from welfare	None – 100%	0.472	(0.0.54, 4.419)	0.499
	Less than 50% – 100%	2.694	(1.651, 4.396)	0.000
	50 to 99.9% – 100%	1.728	(0.915, 3.264)	0.092
Household social class	Non-manual – professional/manager	0.724	(0.405, 1.295)	0.276
	Skilled – professional/manager	0.411	(0.228, 0.739)	0.003
	Unskilled – professional/manager	0.276	(0.140, 0.543)	0.000
Highest level of education of parents	Primary – degree/post-grad	0.023	(0.003, 0.185)	0.000
	Lower secondary – degree/post grad.	0.070	(0.033, 0.149)	0.000
	Upper secondary - degree/post grad.	0.231	(0.134, 0.396)	0.000
	Non-degree - degree/post grad.	0.340	(0.196, 0.588)	0.000

Table 4.7: Odds ratios and significance tests for each relationship with family variables tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Mother's demandingness	–	0.905	(0.728, 1.124)	0.366
Mother's responsiveness	–	0.763	(0.625, 0.932)	0.008
Father's demandingness	–	1.188	(0.933, 1.512)	0.163
Father's responsiveness	–	0.822	(0.653, 1.035)	0.095
Positive relationship with primary caregiver	–	1.017	(0.819, 1.264)	0.877
Conflict with primary caregiver	–	0.659	(0.527, 0.825)	0.000
Dependence on primary caregiver	–	0.709	(0.571, 0.879)	0.002
Positive relationship with secondary caregiver	–	0.993	(0.718, 1.374)	0.966
Conflict with secondary caregiver	–	0.642	(0.454, 0.908)	0.012
Dependence on secondary caregiver	–	0.984	(0.721, 1.342)	0.917
Has brothers and sisters	No – yes	0.581	(0.305, 1.106)	0.330
Positive relationship with siblings	Always – sometimes Never – sometimes	0.326 0.611	(0.190, 0.559) (0.132, 2.841)	0.001 0.325
Talk to mum about problem	Yes-no	1.444	(0.552, 3.778)	0.048
Talk to dad about problem	Yes-no	1.371	(0.849, 2.214)	0.015
Talk to mum's partner about problem	Yes-no	0.304	(0.088, 1.052)	0.151
Talk to dad's partner about problem	Yes-no	0.299	(0.052, 1.709)	0.289
Talk to another relative about problem	Yes-no	0.199	(0.048, 0.829)	0.693
Has fun with the study child every day	Yes-no	1.008	(0.501, 2.029)	0.998

Table A4.8: Odds ratios and significance tests for each variables measuring relationships with teacher tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Talks to their teacher about their problems	Yes-no	1.211	(0.712, 2.057)	0.693
Likes their teacher	Always – sometimes Never – sometimes	0.652 0.307	(0.394, 1.079) (0.085, 1.115)	0.090 0.210

Table A4.9: Odds ratios and significance tests for each variable measuring relationship with peers tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Talk to their friends about their problems	Yes-no	1.399	(0.817, 2.396)	0.030
Number of close friends (reported by primary caregiver)	None – 4 or more	0.261	(0.062, 1.092)	0.150
	1 – 4 or more	0.572	(0.168, 1.950)	0.249
	2 or 3 – 4 or more	1.306	(0.785, 2.172)	0.207

Table A4.10: Odds ratios and significance tests for each relationship with family variable tested separately at age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Mother's demandingness	–	1.493	(1.205, 1.851)	0.000
Mother's responsiveness	–	1.494	(1.207, 1.850)	0.000
Autonomy granting by mother	–	1.168	(0.944, 1.446)	0.153
Father's demandingness	–	1.395	(1.147, 1.697)	0.001
Father's responsiveness	–	1.431	(1.154, 1.776)	0.001
Autonomy granting by father	–	1.280	(1.012, 1.618)	0.039
Positive relationship with primary caregiver	–	1.066	(0.897, 1.267)	0.466
Conflict with primary caregiver	–	0.806	(0.674, 0.964)	0.018
Positive relationship with secondary caregiver	–	1.093	(0.877, 1.363)	0.428
Conflict with secondary caregiver	–	0.664	(0.504, 0.874)	0.004
Monitoring - primary caregiver	–	0.917	(0.776, 1.084)	0.309
Disclosure - primary caregiver	–	0.801	(0.669, 0.960)	0.016
Monitoring - secondary caregiver	–	1.351	(1.045, 1.748)	0.022
Disclosure - secondary caregiver	–	1.001	(0.781, 1.283)	0.996
Parental control	–	0.893	(0.738, 1.082)	0.248

Table A4.11: Odds ratios and significance tests for each variable measuring relationship with teacher tested separately at age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
The child is told by a teacher that your work is good	Very often/often – a few times/never	4.501	(2.700, 7.504)	0.000
The child is encouraged to ask questions in class	Very often/often – a few times/never	1.046	(0.719, 1.522)	0.813
The child's teacher praises them for answering a question	Very often/often – a few times/never	2.882	(1.903, 4.366)	0.000
The child is given out to by a teacher because your work is untidy or not done on time	Very often/often – a few times/never	0.404	(0.212, 0.770)	0.006
The child is asked questions in class by the teacher	Very often/often – a few times/never	1.270	(0.840, 1.921)	0.257
The child is given out to by a teacher for misbehaving in class	Very often/often – a few times/never	0.395	(0.210, 0.746)	0.004

Table 4.12: Odds ratios and significance tests for each variable measuring the child's relationship with peers tested separately at age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Feelings of alienation	–	0.854	(0.713, 1.024)	0.088
Feelings of trust	–	1.154	(0.971, 1.372)	0.104
Number of close friends	None or one – 4 or more	0.796	(0.354, 1.789)	0.581
	2 or 3 – 4 or more	1.077	(0.721, 1.611	0.716

Table A4.13: Odds ratios for each variable measuring the child's educational and expectations tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
How well the study child thinks they are doing at school?	Well – average	1.727	(0.929, 3.210)	0.055
	Poor – average	1.219	(0.135, 11.013)	0.958

Table A4.14: Odds ratios and significance tests for each variables measuring attitudes towards school tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Likes school	Always – never	0.614	(0.377, 1.001)	0.050
	Sometimes – never	0.236	(0.091, 0.613)	0.003
Looks forward to school	Always – never	0.342	(0.201, 0.581)	0.000
	Sometimes – never	0.303	(0.143, 0.642)	0.002

Table A4.15: Odds ratios and significance tests for each variable measuring parental involvement in the study child's education tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Attendance at formal meeting with the study child's teacher? (parent report)	Yes-No	0.471	(0.187, 1.187)	0.795
Parents /guardians attendance at parent/teacher meetings? (teacher report)	Yes-No	10.964	(2.637, 45.588)	0.004
How often parents provide help with their homework?	Always – rarely/never	0.295	(0.132, 0.661)	0.005
	Regularly – rarely/never	0.358	(0.146, 0.881)	0.006
	Now and again – rarely/never	0.754	(0.328, 1.735)	0.544

Table A4.16: Odds ratios and significance tests for each variable measuring parental involvement in the study child's education tested separately at age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Parents have attended a formal meeting with the study child's teacher	Yes-No	1.706	(0.931, 3.125)	0.084
Parents have attended a school concert, play or other event	Yes-No	1.708	(1.162, 2.509)	0.006
Parents have met the principal or about child's behaviour or school performance	Yes-No	0.502	(0.324, 0.778)	0.002
Parents have spoken to the principal or on the phone about child's behaviour or school performance	Yes-No	0.466	(0.285, 0.760)	0.002
How often the study child's parents help with their homework	Always – rarely/never	0.136	(0.049, 0.380)	0.000
	Regularly – rarely/never	0.542	(0.302, 0.975)	0.041
	Now and again – rarely/never	0.668	(0.430, 1.038)	0.072

Table A4.17 Odds ratios and significance tests for each variable measuring the study child's lifestyle tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Time spent watching TV/ videos/ DVDs on normal week day	Less than 1 hour – no time	0.982	(0.192, 5.009)	0.840
	More than 1 hour – no time	0.928	(0.194, 4.434)	0.806
Time spent reading for pleasure on normal week day	Less than 1 hour – no time	7.173	(2.737, 18.796)	0.000
	More than 1 hour – no time	20.201	(7.163, 56.972)	0.000
Time spent using a computer on normal week day	Less than 1 hour – no time	1.707	(1.025, 2.844)	0.013
	More than 1 hour – no time	1.735	(0.853, 3.529)	0.076
Time spent playing video games on normal week day	Less than 1 hour – no time	1.551	(0.928, 2.592)	0.664
	More than 1 hour – no time	1.116	(0.598, 2.082)	0.391
Participates in sports/ fitness club	Yes-No	2.454	(1.486, 4.053)	0.000
Participates in cultural activities	Yes-No	2.620	(1.586, 4.329)	0.001
Participates in youth club	Yes-No	0.355	(0.162, 0.775)	0.039
Study child participates in scouts/ guides	Yes-No	2.511	(1.315, 4.795)	0.017
Participates homework club	Yes-No	0.190	(0.080, 0.453)	0.000
Time spent doing things with friends outside of school	Never – Every day	2.030	(0.781, 5.280)	0.095
	Rarely– Every day	5.226	(2.432, 11.233)	0.000
	Some days– Every day	3.135	(1.712, 5.740)	0.023
	Most days– Every day	1.541	(0.762, 3.116)	0.141

Table A4.18: Odds ratios and significance tests for each variable measuring engagement with family tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
How often the study child feels they have a say in what the family does	Always – never	0.236	(0.081, 0.682)	0.010
	Sometimes - never	0.703	(0.281, 1.761)	0.148
Time spent eating with parents in the last week	Yes – no	0.290	(0.079, 1.057)	0.147
Time spent visiting relatives with parents in the last week	Yes – no	1.039	(0.628, 1.719)	0.633
Time spent watching TV with parents in the last week	Yes – no	1.653	(0.790, 3.460)	0.684
Time spent chatting with parents in the last week	Yes – no	1.017	(0.317, 3.258)	0.996
Time spent going to the park with parents in the last week	Yes – no	0.754	(0.434, 1.309)	0.175
Time spent going swimming with parents in the last week	Yes – no	1.516	(0.880, 2.611)	0.261
Time spent playing games at home with parents in the last week	Yes – no	0.831	(0.519, 1.329)	0.822
Time spent playing games outside with parents in the last week	Yes – no	0.932	(0.563, 1.543)	0.984
Time spent reading something with parents in the last week	Yes – no	0.566	(0.317, 1.010)	0.091
Time spent eating with child (parent report)	Every day – < 2 days	2.313	(0.699, 7.654)	0.345
	3-6 days – < 2 days	4.684	(1.265, 17.349)	0.277
Time spent playing games with child (parent report)	Every day – < 2 days	1.185	(0.500, 2.809)	0.719
	3-6 days – < 2 days	1.440	(0.811, 2.556)	0.082
Time spent talking about things with child (parent report)	Every day – < 2 days	4.067	(1.616, 10.239)	0.046
	3-6 days – < 2 days	7.304	(2.594, 20.568)	0.014
Time spent doing household activities with child (parent report)	Every day – < 2 days	1.092	(0.561, 2.128)	0.410
	3-6 days – < 2 days	1.857	(0.908, 3.798)	0.418
Time spent going on outing with child (parent report)	Every day – < 2 days	1.157	(0.527, 2.539)	0.690
	3-6 days – < 2 days	1.162	(0.628, 2.148)	0.753
Time spent with extended family	–	1.040	(0.857, 1.262)	0.213

Table A.19: Odds ratios and significance tests for each variable measuring engagement with school variable tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Number of days during the last school year that the study child was absent from school (parent report)	None – more than 10	2.484	(0.906, 6.809)	0.319
	1-3 days – more than 10	1.834	(0.834, 4.030)	0.616
	4-6 days – more than 10	2.183	(0.964, 4.943)	0.500
	7-10 days – more than 10	1.192	(0.476, 2.982)	0.807
Number of days that the study child was absent from school (teacher report)	–	0.952	(0.918, 0.987)	0.045
How often the study child arrives at school with incomplete homework (teacher report)	Never – occasionally	5.594	(3.175, 9.855)	0.000
	Regularly – occasionally	0.399	(0.153, 1.042)	0.035

Table A4.20: Odds ratios and significance tests for each variable measuring the study child's lifestyle tested separately at age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Time spent watching TV/ videos/ DVDs on normal week day	Less than 1 hour – no time	1.377	(0.192, 9.896)	0.047
	More than 1 hour – no time	2.332	(0.471, 11.546)	0.059
Time spent reading for pleasure on normal week day	Less than 1 hour – no time	3.208	(1.740, 5.912)	0.000
	More than 1 hour – no time	2.752	(1.546, 4.899)	0.001
Time spent using a computer on normal week day	Less than 1 hour – no time	2.418	(1.274, 4.586)	0.007
	More than 1 hour – no time	1.035	(0.580, 1.845)	0.908
Time spent playing video games on normal week day	Less than 1 hour – no time	2.491	(1.572, 3.947)	0.000
	More than 1 hour – no time	1.050	(0.703, 1.568)	0.812
Participates in a regular leisure activity	Yes-No	1.652	(0.882, 3.095)	0.117
Plays sports/physical activities without a coach	Yes-No	1.636	(1.067, 2.508)	0.024
Plays sports with a coach or as part of organised team	Yes-No	1.421	(0.918, 2.198)	0.115
Participates in dance, drama or music lessons	Yes-No	1.300	(0.880, 1.920)	0.187
Participates in a homework club	Yes-No	0.421	(0.231, 0.767)	0.005
Participates in clubs, or groups such as Guides or Scouts, youth club, community	Yes-No	0.708	(0.474, 1.059)	0.093

Table A4.21: Odds ratios and significance tests for each variable measuring engagement with family tested separately at age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Time spent eating with child	Every day – < 2 days	0.885	(0.422, 1.857)	0.747
	3-6 days – < 2 days	1.111	(0.503, 2.454)	0.794
Time spent playing games with child	Every day – < 2 days	0.633	(0.180, 2.226)	0.476
	3-6 days – < 2 days	0.827	(0.464, 1.473)	0.519
Time spent talking about things with child	Every day – < 2 days	1.856	(0.948, 3.631)	0.071
	3-6 days – < 2 days	1.470	(0.699, 3.092)	0.310
Time spent doing household activities with child	Every day – < 2 days	0.727	(0.438, 1.207)	0.218
	3-6 days – < 2 days	0.946	(0.592, 1.514)	0.818
Time spent going on outing with child	Every day – < 2 days	0.486	(0.170, 1.391)	0.178
	3-6 days – < 2 days	0.657	(0.362, 1.192)	0.167
Time spent with extended family	–	1.041	(0.855, 1.267)	0.690

Table A4.22. Odds ratios and significance tests for each engagement with school variable tested separately at age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Number of days the study child was absent from school	None – more than 10	1.104	(0.526, 2.318)	0.793
	1-3 days – more than 10	1.334	(0.726, 2.450)	0.353
	4-6 days – more than 10	1.537	(0.844, 2.799)	0.159
	7-10 days – more than 10	0.900	(0.463, 1.751)	0.757
Disengagement from school	–	0.733	(0.625, 0.859)	0.001

Table A4.23 Odds ratios and significance tests for each variable related to the child's self-concept tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Behavioural adjustment	–	2.037	(1.524, 2.721)	0.000
Intellectual and school status	–	1.835	(1.338, 2.517)	0.000
Physical appearance and attributes	–	1.187	(0.935, 1.508)	0.159
Freedom from anxiety	–	2.038	(1.506, 2.760)	0.000
Popularity	–	1.617	(1.232, 2.123)	0.001
Happiness and satisfaction	–	1.484	(1.132, 1.946)	0.004

Table A4.24 Odds ratios and significance tests for each variable related to the child's psychological adjustment and temperament tested separately at age nine

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Emotional symptoms (SDQ parent)	–	0.557	(0.432, 0.719)	0.000
Conduct problems (SDQ parent)	–	0.534	(0.418, 0.682)	0.000
Hyperactivity (SDQ parent)	–	0.547	(0.425, 0.704)	0.000
Peer relations (SDQ parent)	–	0.754	(0.604, 0.941)	0.012
Pro social (SDQ parent)	–	0.928	(0.757, 1.137)	0.471
Shyness (EAS)	–	0.867	(0.704, 1.069)	0.182
Emotionality (EAS)	–	0.652	(0.528, 0.806)	0.000
Activity scale (EAS)	–	1.066	(0.843, 1.348)	0.594
Sociability scale (EAS)	–	0.846	(0.688, 1.041)	0.113
Emotional symptoms (SDQ teacher)	–	0.562	(0.439, 0.720)	0.000
Conduct problems (SDQ teacher)	–	0.589	(0.471, 0.736)	0.000
Hyperactivity (SDQ teacher)	–	0.291	(0.203, 0.418)	0.000
Peer relations (SDQ teacher)	–	0.611	(0.493, 0.759)	0.000
Pro social (SDQ teacher)	–	1.326	(1.059, 1.662)	0.014

Table A4.25: Odds ratios and significance tests for each variable related to the child's self-concept tested separately at age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
Behavioural adjustment	–	1.510	(1.202, 1.896)	0.000
Intellectual and school status	–	2.023	(1.616, 2.533)	0.000
Physical appearance and attributes	–	1.112	(0.926, 1.334)	0.255
Freedom from anxiety	–	1.174	(0.983, 1.401)	0.076
Popularity	–	0.897	(0.761, 1.058)	0.196
Happiness and satisfaction	–	0.981	(0.815, 1.181)	0.841

Table A4.26: Odds ratios and significance tests for each variable related to the child's psychological adjustment and temperament tested separately at age 13

Variable	Comparison	Odds ratio	95% CI of odds ratio	*p*
SDQ – emotional	–	0.570	(0.478, 0.680)	0.000
SDQ – conduct problems	–	0.654	(0.555, 0.771)	0.000
SDQ – hyperactivity	–	0.415	(0.339, 0.507)	0.000
SDQ – peer relations	–	0.851	(0.731, 0.992)	0.039
SDQ – pro social	–	1.100	(0.938, 1.290)	0.235
TIPI – extravert	–	1.109	(0.944, 1.304)	0.208
TIPI – agreeable	–	1.088	(0.929, 1.274)	0.297
TIPI – conscientious	–	1.411	(1.193, 1.669)	0.000
TIPI – emotional	–	1.389	(1.174, 1.644)	0.001
TIPI – openness	–	1.327	(1.118, 1.575)	0.001
Depression	–	0.844	(0.719, 0.992)	0.039

Appendix C: Ancillary tables for Chapter 5

Table A5.1: Percentage of missing cases for each variable to be included in the model of academic resilience, by resilience status (age nine)

	Resilient	Other
Time spent reading for pleasure	0.0	0.2
Member of a sports club	0.0	0.2
Engages in cultural activities	0.0	0.3
Takes part in homework club	0.0	0.4
Frequency parent helps with homework	0.5	0.4
Time spent with friends	0.0	0.1
How far parent expects child to go in education	0.0	0.5
Frequency parent talks to child	0.0	0.2
Highest level of parental education	0.0	0.0
Child likes school	0.0	1.1
Positive relationship with siblings	14.2	15.3
Has a say in family decisions	2.6	5.6
Behavioural adjustment	5.3	5.7
Freedom from anxiety	4.7	5.0
SDQ emotional symptoms (primary caregiver)	2.1	0.2
SDQ hyperactivity (teacher report)	1.6	3.3
Conflict with primary caregiver	0.0	0.8
Dependent on primary caregiver	0.5	0.4
Social class	18.9	23.7
Frequency homework not complete	2.1	4.2
Parents attend parent-teacher meetings	11.6	12.6
Child talks to their dad about their problems	0.5	5.2
Child talks to their friends about their problems	1.1	5.5
Mother’s responsiveness	6.8	6.0
Teacher rating of school performance	3.7	5.4

Table A5.2: Sequence of removal of non-significant relationships in the final model, age nine

Relationship	*p*
Parental educational expectations ON social class	.885
Parents help with homework ON child talks to their father about their problems	.497
Parents help with homework ON parents talk with child	.507
Parents help with homework ON the child has a say in family activities	.449
Parents help with homework ON the child gets along with siblings	.331
Parents help with homework ON mother's responsiveness	.572
Parents help with homework ON conflict with primary caregiver	.601
Parents help with homework WITH frequency child has incomplete homework	.136
Child likes school ON child talks with friends about their problems	.361
Frequency child has incomplete homework ON child talks with friends about their problems	.989
Frequency child has incomplete homework ON child always likes school	.063
Frequency child has incomplete homework ON time spent with friends	.051
Piers-Harris freedom from anxiety ON time spent with friends	.403
Piers-Harris behavioural problems ON time spent with friends	.333
Teacher reports of hyperactivity ON time spent with friends	.296
Piers-Harris freedom from anxiety ON child talks to their friends about their problems	.058
Piers-Harris behavioural problems ON child talks to their friends about their problems	.107
Parent reports of emotional symptoms ON child talks to their friends about their problems	.121
Teacher reports of hyperactivity ON child talks to their friends about their problems	.669
Piers-Harris freedom from anxiety ON frequency child has incomplete homework	.676
Piers-Harris behavioural problems ON frequency child has incomplete homework	.066
Piers-Harris behavioural problems ON child is a member of a sports club	.989
Teacher reports of hyperactivity ON child is a member of a sports club	.840
Parent reports of emotional symptoms ON child is a member of a sports club	.257
Piers-Harris freedom from anxiety ON child engages in cultural activities	.525
Piers-Harris behavioural problems ON child engages in cultural activities	.463
Parent reports of emotional symptoms ON child engages in cultural activities	.644
Piers-Harris freedom from anxiety ON child attends a homework club	.103
Piers-Harris behavioural problems ON child attends a homework club	.307
Parent reports of emotional symptoms ON child attends a homework club	.904
Piers-Harris freedom from anxiety ON frequency child reads for pleasure	.443
Parent reports of emotional symptoms ON frequency child reads for pleasure	.590
Parent reports of emotional symptoms ON gets along with siblings	.168
Teacher reports of hyperactivity ON gets along with siblings	.209
Piers-Harris behavioural problems ON gets along with siblings	.266
Piers-Harris freedom from anxiety ON gets along with siblings	.084
Piers-Harris freedom from anxiety ON child talks to their father about their problems	.174
Piers-Harris behavioural problems ON child talks to their father about their problems	.952
Parent reports of emotional symptoms ON child talks to their father about their problems	.364
Teacher reports of hyperactivity ON child talks to their father about their problems	.400
Piers-Harris freedom from anxiety ON parents talk with child	.967
Piers-Harris behavioural problems ON parents talk with child	.141
Parent reports of emotional symptoms ON parents talk with child	.758
Piers-Harris freedom from anxiety ON the child has a say in family activities	.984
Piers-Harris behavioural problems ON the child has a say in family activities	.221
Parent reports of emotional symptoms ON the child has a say in family activities	.224
Parent reports of hyperactivity ON the child has a say in family activities	.065
Piers-Harris freedom from anxiety ON dependence on primary caregiver	.391
Piers-Harris behavioural problems ON dependence on primary caregiver	.751
Teacher reports of hyperactivity ON dependence on primary caregiver	.570
Piers-Harris freedom from anxiety ON conflict with primary caregiver	.552
Teacher reports of hyperactivity ON mother's responsiveness	.420
Parent reports of emotional symptoms ON mother's responsiveness	.090
Piers-Harris freedom from anxiety ON teachers' reports of hyperactivity	.146
Piers-Harris behavioural problems ON parents' reports of emotional symptoms	.679
Resilience ON Piers-Harris freedom from anxiety	.871
Resilience ON Piers-Harris behavioural problems	.908
Resilience ON teachers' reports of hyperactivity	.150

Note: ON refers to regression and WITH refers to correlation

Table 5.3: Sequence of removal of non-significant relationships in the nested model, age nine

Relationship	*p*
Resilience ON engagement in school	0.229
Resilience ON Piers-Harris behavioural problems	0.957
Resilience ON Piers-Harris freedom from anxiety	0.062

Table A5.4: Percentage of missing cases for each variable to be included in the model of academic resilience, by resilience status, age 13

Variable	Resilient	Vulerable
Gender	0.0	0.0
Parental education level	0.0	0.1
Proportion of income from welfare	1.5	0.7
Mother's demandingness	5.1	4.6
Mother's responsiveness	4.5	4.3
Conflict with secondary caregiver	42.9	45.2
Disclosure to primary caregiver	0.0	0.3
Frequency told by teacher that work is good	0.5	0.2
Frequency praised by teacher	0.5	0.3
Parental educational expectations	2.0	2.5
Child's educational expectations	2.0	1.3
How much child likes school	0.5	0.1
Frequency parents help with homework	0.5	0.3
Parent has attended a school concert, play or other event	1.0	0.4
Parent has met with principal about the child's behavior or performance	1.0	0.4
Frequency child reads for pleasure	0.5	0.5
Frequency child plays video games	1.0	0.5
Child takes part in sports	0.5	0.3
Child takes part in homework club	0.5	0.4
Child was late for school	0.5	0.2
Child got in trouble for not following rules	0.5	0.3
Child skipped classes	0.5	0.2
Child messed in class	0.5	0.2
Child had to do extra work as punishment	0.5	0.2
Child had to do detention	0.5	0.2
Child was suspended from school	0.5	0.3
Child's level of emotional symptoms (parental report)	0.0	0.0
Child's level of hyperactivity (parental report)	0.0	0.0
Child's intellectual self-concept	0.5	1.0

Table A5.5: Sequence of removal of non-significant relationships in the final model, age 13

Relationship	*p*
Frequency parent helps with homework ON parents have attended school event	0.418
Child likes school ON teacher has praised the child	0.320
Parents have attended school event ON parental education level	0.217
Parents have seen principal about child's behaviour or performance ON parental education level	0.947
Frequency parents help with homework ON mother's demandingness	0.546
Frequency parents help with homework ON mother's responsiveness	0.354
Frequency parents help with homework ON disclosure to primary caregiver	0.892
Child expectations ON teacher has praised the child	0.542
Disengagement ON teacher has praised the child	0.070
Intellectual self-concept ON teacher has praised the child	0.511
Child expectations ON Frequency parents help with homework	0.193
Emotional symptoms ON child takes part in homework club	0.704
Intellectual self-concept ON child takes part in homework club	0.196
Emotional symptoms ON time spent reading for pleasure	0.559
Emotional symptoms ON time spent playing video games	0.058
Hyperactivity ON time spent reading for pleasure	0.317
Hyperactivity ON participation in sport	0.437
Emotional symptoms ON disclosure to primary caregiver	0.148
Intellectual self-concept ON disclosure to primary caregiver	0.377
Emotional symptoms ON mum's level of demandingness	0.417
Hyperactivity ON mum's level of demandingness	0.196
Emotional symptoms ON mum's level of responsiveness	0.183
Hyperactivity ON mum's level of responsiveness	0.381
Disengagement ON child's expectations	0.070
Emotional symptoms ON disengagement	0.428
Hyperactivity ON gender	0.296
Resilience ON disengagement	0.315

Note: ON refers to regression and WITH refers to correlation

Table A5.6: Sequence of removal of non-significant relationships in the nested model, age 13

Relationship	*p*
Emotional symptoms ON disengagement from school	0.467
Resilience ON disengagement from school	0.671