

Longitudinal studies on variation by socio-economic position in child conduct, academic outcomes and curricular choice in the Irish context

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Ryan Alberto Ó Giobúin

Under the Supervision of
Prof. Richard Layte

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Student ID: 11330561

Submitted under the Department of Sociology,
School of Social Sciences and Philosophy,
Trinity College Dublin

Declaration

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A handwritten signature in cursive script, reading "Ryan Alberto Ó Giobúin", is written over a horizontal line.

Ryan Alberto Ó Giobúin

29th March, 2022

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Declaration of co-authorship

This signed declaration describes the contribution of the candidate and the co-author(s) to each of the papers/chapters of this thesis in order to identify the candidate's independent contribution to each work.

Name of candidate: Ryan Alberto Ó Giobúin

Title of dissertation: Longitudinal studies on variation by socio-economic position in child conduct, academic outcomes and curricular choice in the Irish context

Paper/Findings Chapter:

- Study 1: When and why do socio-economic differences in student disaffection emerge? A longitudinal study from age 9 to 17/18.

Ryan Alberto Ó Giobúin is the first author of this paper. This paper was co-authored with Professor Richard Layte. Ryan Alberto Ó Giobúin developed the central theoretical framework of the paper and conducted the statistical analyses. Professor Richard Layte contributed to the development of the theoretical framework of the paper, provided feedback and advice on the analyses (in particular the employment of counter-factual analysis), and assisted with the editing of the final drafts.

- Study 2: A fixed effects analysis of the effect of financial strain and parental depression on child behavioural difficulties during the Great Recession in Ireland.

Ryan Alberto Ó Giobúin is the first author of this paper. This paper was co-authored with Professor Richard Layte. Ryan Alberto Ó Giobúin compiled the literature and theoretical framework and conducted the analyses. Professor Richard Layte contributed to the development of the theoretical framework, provided advice and feedback on the fixed effects models employed, and assisted with the editing of the paper.

- Study 3: The effect of school type and ethos on student learning outcomes

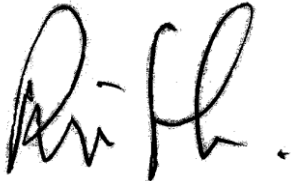
Ryan Alberto Ó Giobúin is the first author of this paper. This paper was co-authored with Professor Richard Layte. Ryan Alberto Ó Giobúin developed the initial theoretical framework, compiled the literature review and conducted the majority of the analysis. Professor Richard Layte contributed to the development of the theoretical model, advised and assisted with the propensity score matching techniques used in the analyses, and assisted with the editing of the paper.

- Study 4: Constrained by choice: social class and subject-level selection in the Irish secondary education system

Ryan Alberto Ó Giobúin is the first author of this paper. This paper was co-authored with Professor Richard Layte. Ryan Alberto Ó Giobúin developed the theoretical framework, literature review and analyses. Professor Richard Layte contributed to the development of the theoretical model, advised on appropriate analytical techniques and the interpretation of findings, and assisted with the editing of the paper.

Statement by the co-author:

I hereby confirm that the doctoral candidate's described contribution to the work where I am listed as co-author is correct, and I consent to including the work in the named dissertation.

Signed: 

Prof. Richard Layte.
Head of Department.

Date: 29th March 2022

Aim

Using unique, nationally representative longitudinal data from Cohort98 of Growing Up in Ireland (N=6,039; 51.2% female; ages 9-17), this thesis evaluates socio-economic inequalities in educational development, decision-making and outcomes among a cohort of young people in Ireland between the ages of 9 and 17/18 in the period immediately prior to, during and after the Great Recession of 2010 to 2016. The thesis approaches the question of inequality in education from a holistic perspective, looking both at the development of inequalities in achievement (primary effects of social origin) and the extent to which decision-making in school differs by family socio-economic position (SEP), net of prior academic performance (secondary effects of social origin).

The research goals have been approached through four distinct studies that link back to the central theme of inequalities by SEP in education, whilst testing a number of important theories. The core research questions of each paper are as follows:

Study I: Social class differentials in conduct and self-esteem: does poor conduct precede poor academic performance or is it a consequence?

Study II: The role of home environment and family processes in emotional and behavioural problems: can class differentials be explained via higher levels of financial strain on lower-class households?

Study III: School type, school ethos and academic performance: does the effect of school type reflect variation in student composition, in teacher-student relations, or in disciplinary climate?

Study IV: *Social class differentials in third-level participation: can relative risk aversion explain class differentials in student curriculum selections?*

Socio-economic differentials in educational performance and outcomes

The twentieth century witnessed a marked expansion of education systems across most affluent nations, with the result that there was a major increase in the average educational attainment of country populations. The early twentieth century saw the development of free universal primary education, with secondary education following suit from the middle of the century. The end of the twentieth century up to the present period has largely continued the trajectory of increasing educational expansion, most noticeably in the ongoing increase in higher education accessibility and participation (Jackson 2013b).

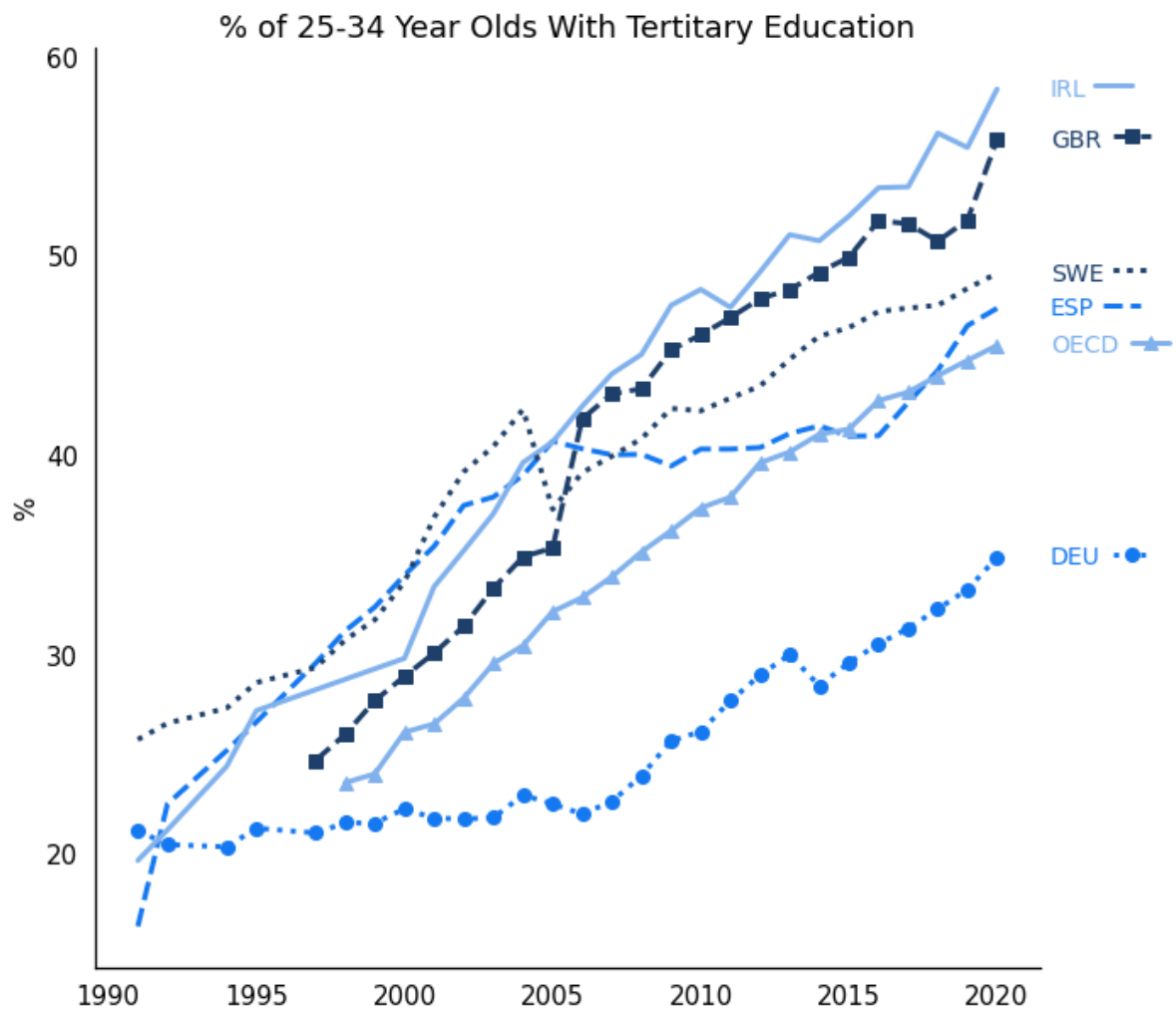
The changes to both the education and policy environment in developed countries have led to the logical expectation that socio-economic inequalities in education should narrow. Many had expected that inequalities by SEP in educational performance would reduce with improved access to earlier education, such as preschool, and improving living conditions (Burger 2010; Heckman 2006). Furthermore, the combination of increasingly accessible higher education, coupled with ceiling effects limiting the potential for ever-increasing educational attainment by higher-SEP students, ought to result in reducing SEP gaps in educational attainment (Goldthorpe 1996; van de Werfhorst and Hofstede 2007).

There is some evidence to indicate that improvements in access to education have weakened the association between SEP and educational performance and attainment (Breen et al. 2009; Jonsson, Mills, and Müller 1996). However, in spite of such changes, educational inequality has remained remarkably stable, even as other inequalities, such as gender, race and ethnicity, have experienced marked improvements (Erikson and Goldthorpe 1992; Jackson 2013b; Shavit and Blossfeld 1993). SEP performance gaps continue to exist, with children from lower-SEP backgrounds having worse performance at every stage of education than their more advantaged peers (Jackson 2013a; Shavit and Blossfeld 1993). Similarly, while barriers to higher education have been lowered, making

the pursuit of prolonged education more accessible to lower-SEP students than was previously the case, SEP differences in the institutes of higher education selected and disciplines pursued contribute to the continuation of SEP differentials in education outcomes (Breen et al. 2009; Lucas 2009).

These inequalities are exhibited to varying degrees across the developed world, and are similarly reflected in the Irish context. The Irish education system has been typified by a fast and comprehensive increase in educational attainment in the second half of the twentieth century. In the mid-1960s, approximately 5% of 18-year-olds proceeded to higher education (Clancy 2015). The expansion of secondary education in response to the *Investment in Education* report of 1965, coupled with the introduction of free post-primary secondary education in 1967, set the framework for increasing educational attainment and the enhanced opportunity of entry into higher education (Walsh et al. 2014). Tertiary enrolment rates increased substantially each decade, with the introduction of free higher education in Ireland in the 1990s leading to a major increase in the enrolment rate in tertiary education, with student enrolment rising 89% from 1989 (81,000) to 1999 (151,000) (Clancy 2015). Spurred on by an academically focused secondary education system, this growth in third-level attainment has helped Ireland reach tertiary education rates that are high even when compared with other economically developed European countries (Figure 1. 1).

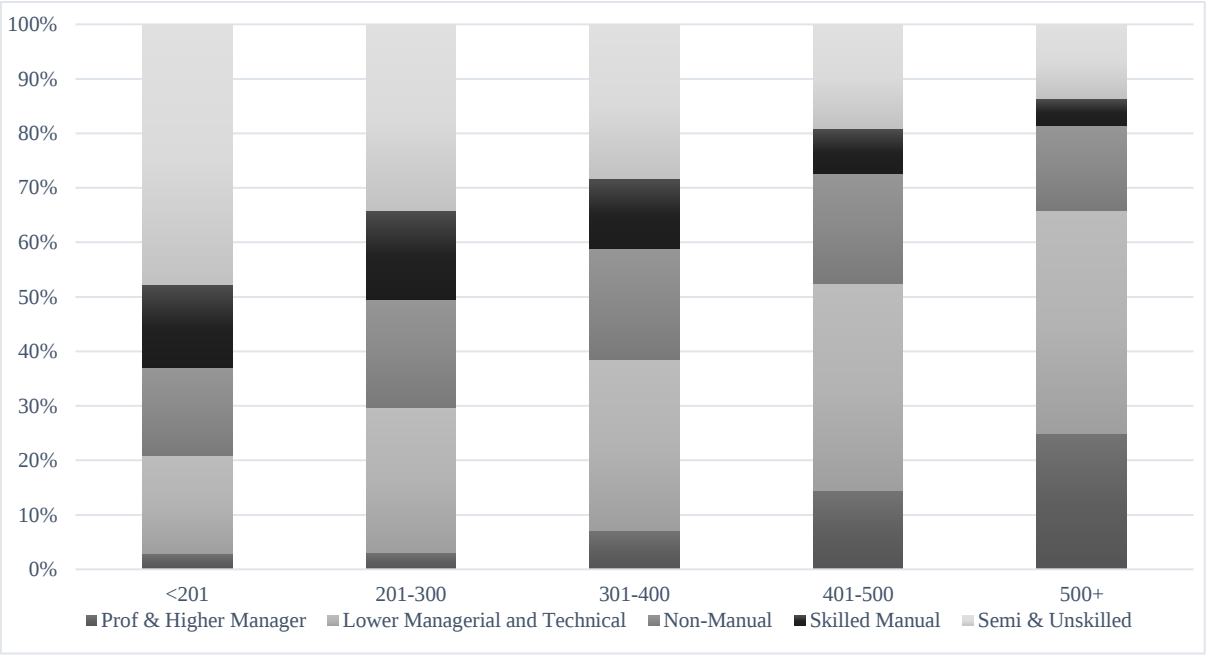
Figure 1. 1: Percentage of 25-34 year olds with tertiary education in selected countries. Source: Eurostat



Tertiary education participation has reached saturation level among high-SEP students (Clancy 2015). However, aggregated data risks masking underlying socio-economic inequalities in both educational performance and attainment. While there has been a marked increase in absolute educational attainment across SEP groups, evidence from the 1970s to 2000 shows no weakening of the association between class and educational attainment (Whelan and Layte 2006). At each educational stage, students from lower-SEP backgrounds continue to underperform relative to their higher-SEP peers and have lower odds of both entering and completing higher education than do students from more advantaged backgrounds (McCoy et al. 2010; McCoy and Smyth 2011; Smyth and McCoy 2011). For instance, while secondary education completion rates are high across socio-

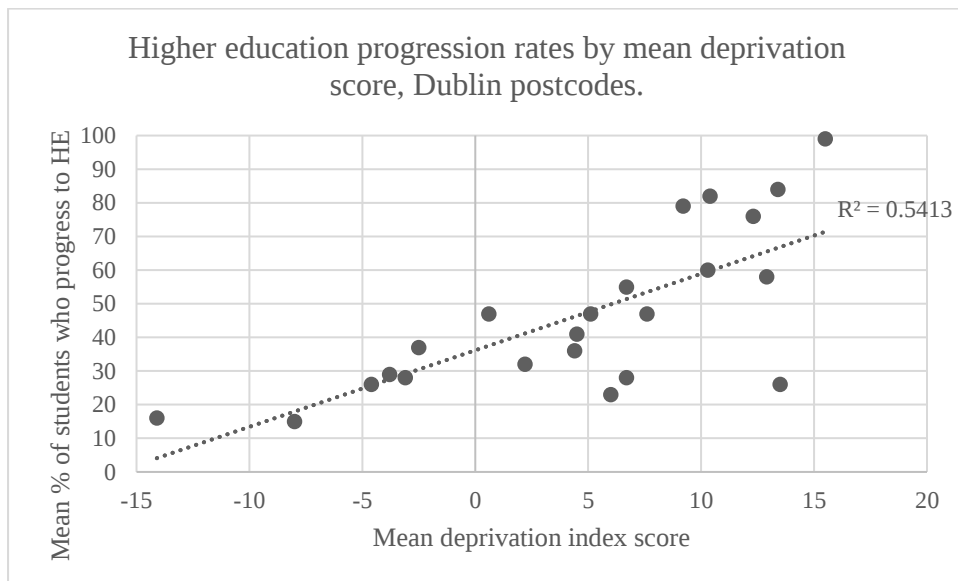
economic backgrounds and have increased over time, differentials in Leaving Certificate (baccalaureate) examination results remain. Higher-SEP students achieve higher examination results on average and are over-represented in the top performing groups as well as under-represented in the worst performing groups (see Figure 1. 2). These socio-economic differentials are also illustrated in the association between local area deprivation measures and higher education progression rates within Dublin. Figure 1. 3 shows a strong positive association between an area’s deprivation score (where higher scores imply lower deprivation) and the percentage of students who enrol in higher education after secondary education.

Figure 1. 2: Social class composition of groups defined by performance in the Leaving Certificate Examinations. Higher performance is indicated by higher 'points'¹.



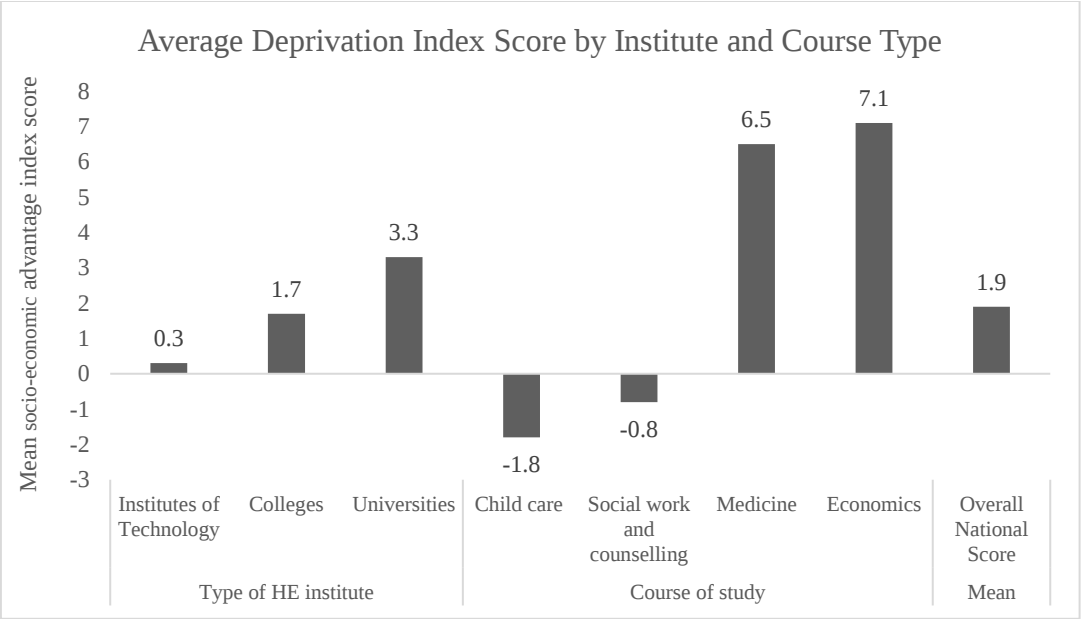
¹ Overall academic performance in the Leaving Certificate is estimated by the points acquired, with points calculated based on the grade obtained in a subject and the difficulty level at which the subject was examined. Subjects are examined at two difficulty levels, *Higher* and *Ordinary*, with mathematics and Irish also examined at a third lower difficulty level, *Foundation*. All subjects, with the exception of mathematics, are graded out of a possible 100 points at *Higher Level*, while the maximum possible points acquisition at *Ordinary Level* is 60. At *Foundation Level* in mathematics and Irish, a maximum of 20 points can be obtained. To encourage students to pursue STEM careers, a further 25 bonus points are added to the *Higher Level* mathematics results, allowing a maximum of 125 points to be obtained. The six best subject points are added, leading to a maximum points tally of 625.

Figure 1. 3: Mean student higher education progression rates of each Dublin postcode, by the mean deprivation score of the postcode. Postcode progression rate data obtained from HEA (2015), postcode deprivation scores obtained from HEA (2019).



Even amongst students who do progress to higher education, socio-economic inequalities continue to manifest themselves in the type of higher education institution attended and disciplines pursued (Cullinan et al. 2013; HEA 2019; Koucký, Bartušek, and Kovařovic 2010). Higher-SEP students are over-represented in the most prestigious higher education institutes (e.g. universities) and disciplines (e.g. medicine and economics), while students from disadvantaged backgrounds are more likely to attend the more vocational-focused Institutes of Technology and to enrol in more practical courses (e.g. child care and social work) compared to their more advantaged peers (Figure 1. 4).

Figure 1. 4: Mean socio-economic advantage index score by institute of higher education type, selected courses of study, and the national mean deprivation score. Source data obtained from HEA (2019).



This indicates that the socio-economic differentials in educational outcomes observed in other developed countries are also present in the Irish educational context. This is despite the Irish education system having a largely undifferentiated primary and secondary education system, and high progression rates to third-level education (Smyth 2016). This makes it an interesting country context in which to analyse the development of educational inequalities, and to test various theoretical explanations for the continuation of educational inequalities. However, to date longitudinal analyses of the development of SEP inequalities in education in Ireland have been limited, with the majority of extant research reliant on cross-sectional data and analysis. This thesis attempts to make a contribution to the international literature on educational inequalities by analysing longitudinal representative data from Ireland, grounded in an interdisciplinary conceptual framework.

Conceptual framework

Common sense leads us to believe that education, learning and academic performance mostly happen within the confines of the classroom and lecture halls of schools and universities. Yet the continued perseverance of socio-economic inequalities in educational performance and achievement, even as educational opportunities have become increasingly accessible, indicates that inequalities do not merely reflect variance in input at the school level, but also factors outside of the education system (Breen et al. 2009; Breen and Jonsson 2005). Students from higher-SEP backgrounds continue to perform better in education than their peers from lower-SEP backgrounds. This has repercussions, not only by directly affecting educational performance and attainment, but also in the associated implications educational inequalities have on other outcomes such as economic well-being (Plenty, Magnusson, and Låftman 2021), physical and mental health (Reiss 2013; Whitfield et al. 2021) and even mortality gradients (Mirowsky and Ross 2003).

While SEP inequalities in education have long been observed in multiple different country contexts, the landmark Coleman Report (1966) was significant in showing that students' social background was extensively associated with their academic performance and outcomes, while school quality and resources, by contrast, showed little association with children's educational attainment. However, over half a century after the release of the Coleman Report, a full understanding of how these inequalities develop and manifest themselves in the first place has not yet been attained, with multiple competing theoretical explanations being suggested across disciplinary backgrounds.

Primary and secondary effects of social origin

Children from lower-SEP backgrounds perform worse, on average, than their higher-SEP peers on standardised tests and formal examinations and are less likely to progress to

higher education even when they have the required results. Boudon (1974) classified such SEP inequalities in educational attainment into distinct ‘primary’ and ‘secondary’ effects of social origin. Primary effects describe the relationship (be it genetic, psychological or socio-cultural) between a child’s SEP and his/her academic performance (Jackson et al. 2007; Shavit and Blossfeld 1993). By contrast, secondary effects reflect the different educational choices taken by students as a function of SEP, given the options their prior academic performance provides them with (i.e. net of primary effects) (Breen and Goldthorpe 1997; van de Werfhorst and Hofstede 2007).

Various theoretical approaches have been applied to primary and secondary effects in an attempt to better explain why these differentials exist. Certain studies, primarily those from psychology and economics, tend to focus on individual differences in motivation, agency and self-esteem when explaining educational outcomes. By contrast, sociological and anthropological research have mostly focused on the role of social groups in shaping outcomes and have a long tradition of proposing cultural explanations for the development and manifestation of SEP inequalities in education.

Individual explanations

The psychological research literature has explored the degree to which engagement with education is a function of individual characteristics, such as students’ goals, achievement, motivation and perceptions of self-efficacy (Eccles 2004; Erikson and Jonsson 1996; Skinner et al. 2008).

Attribution theorists such as Dweck and Leggett have, for instance, hypothesised that student disengagement with education in part reflects how students react to perceived success and failure (Dweck 2002; Dweck and Leggett 1988). If students view poor academic performance as a reflection of low innate inability, this can lead to

disillusionment with and decreased effort in education as they often perceive poor performance as an indication of their ability and assume that this cannot be changed. This disengagement with education further depresses performance, leading to a self-fulfilling cycle of poor educational performance and engagement. In contrast, students who perceive poor performance as something that can be rectified, such as through increased effort, will continue to engage effectively with education and have a higher chance of success in the belief that ability is 'incremental'. These explanations are congruent with psychological work on self-concept, which shows that students who perceive poor performance as a reflection of low innate and therefore unchangeable ability, are more likely to purposely reduce their academic effort in order to explain away poor performance as the product of disinterest as opposed to low inability, thus bolstering their self-esteem (Covington 1992).

Psychological approaches have also highlighted how motivation and the value perceived to be garnered from a task can influence students' engagement with and success in education. Expectancy value theory (Eccles 2004; Eccles, Fredricks, and Baay 2015) hypothesises that motivation is the product of the perceived task value (utility value), the enjoyment the person obtains from performing the task (attainment value), the personal importance of performing the task (intrinsic value) and the negative repercussions of engaging in a task, such as the effort required to succeed and the fear of failure (cost). Applying concepts of achievement motivation to education, a student's engagement and success in education can be evaluated as reflecting, in part, a student's academic motivation. For students who obtain intrinsic utility and attainment value from education, and for whom these values compensate for any perceived costs associated with education, motivation and application to education will be higher. In contrast, for students who perceive education to hold little value either for personal well-being or as a means of realising their goals, amotivation with education can lead to disaffected, ritualistic engagement with education, or early exit from

education (Finn, Pannozzo, and Voelkl 1995; Skinner et al. 2008; Skinner, Kindermann, and Furrer 2009).

Such explanations provide useful mechanisms through which inequalities in educational attainment and performance can be studied. Applying such theories to the framework of primary and secondary effects of social origin, it has been proposed that students from lower socio-economic positions perform worse in education because of disengagement and lower levels of self-efficacy, which in turn dampen students' performance. Similarly, secondary effects could potentially emerge on account of differentials across groups in motivation and perceived task-value by socio-economic background.

Studies have found evidence of socio-economic differentials in student engagement with education and motivation: lower-SEP students, for instance, appear to engage less effectively with education, putting less effort into their studies relative to their higher-SEP peers (Saunders 1995), while also being more likely to hold career ambitions that are less dependent on education (van de Werfhorst and Hofstede 2007). However, by focusing on individual-level mechanisms, theories of self-efficacy and expectancy-value largely fail to address the question of why differences in self-efficacy and motivation vary by social background in the first instance, or why some students are expected to respond in the manners hypothesised. For instance, a student who lacks academic motivation might still acknowledge the value of education and engage effectively with schoolwork. Similarly, students might not respond to poor academic performance with disaffection and resignation, but may instead seek to improve performance through increased effort and engagement. Why these differences should be associated with socio-economic background is, however, not explained in these theories.

Cultural explanations

Sociological and anthropological theorists have proposed alternative explanations that accentuate the role of social and cultural processes in the development of educational inequalities. Primary effects are often explained through the lens of cultural capital theory: lower-SEP students' poor academic performance reflects the disconnect between the knowledge and skills (or cultural capital) that their social background provides them with and the high-brow cultural capital that the education system and schools reward (Bourdieu and Passeron 1977; DiMaggio 1982; Sullivan 2007). Secondary effects in turn are hypothesised to be influenced by socio-cultural dynamics, with the active rejection of education and middle-class values by lower-SEP families and communities leading to lower-SEP students selecting out of education and into manual occupations (Ball 1981; Hargreaves 1967; Willis 1993).

Such approaches rely extensively on the conceptualisation of embodied cultural capital, as presented by Bourdieu and Passeron (1977). Embodied cultural capital reflects knowledge instilled in an individual over time through socialisation, manifesting itself in a person's habitus. Within education, it is suggested that high-brow cultural capital, which is more likely to be held by higher-SEP students, is appreciated within educational environments over the low-brow cultural capital held by lower-SEP students: a process conceptualised as symbolic violence (Bourdieu and Wacquant 1992). This appreciation of certain cultural capitals over others provides higher-SEP students with an academic advantage over their lower-SEP peers (DiMaggio 1982; Sullivan 2007).

The lack of value attributed to working-class cultural capital in educational settings is also suggested by subcultural theorists to be mirrored in a lack of appreciation for education and academic prowess among lower socio-economic families and communities. Various classic studies have explored class-subcultural rejections of, or disconnects with, the

prevailing educational establishments along ethnic and racial lines (Mac an Ghaill 1988; Furlong 1984), gender lines (Connell 1982; McRobbie and Garber 2003; Walker 1988) or both (Fuller 1984). Willis (1993) provides a classic example of class-subcultural disconnect in education among working-class boys in an industrial town in the British midlands. Willis suggests that disaffection with education among the 'lads' (working-class boys) reflects a class-subcultural rejection of middle-class educational values. Conversely, these boys are instead guided by a counterculture that encourages nonconformity with the educational environment and selection out of education at the earliest opportunity, leading to subordinate, manual and low-wage occupations that continue a cycle of class reproduction. Furthermore, Willis observed that this subcultural rejection of education was tolerated and even encouraged by parents, who place little value on formal education and actively discourage conformist behaviour.

Even if not all subcultural explanations of educational inequality assume that lower-SEP families actively reject education, subcultural differentiation in values and approaches to education have been suggested to reflect socio-economic differences in parenting styles and the value this socialisation imbues in the child. Kohn (1977) hypothesised that parents' occupations determine the attitudes and values they cultivate in their child. Lower-SEP parents, working in occupations that provide them with lower levels of autonomy and decision-making responsibility, are more likely to emphasise values of obedience and conformity in their children, reflecting the skills their occupation rewards best. By contrast, higher-SEP parents, who are more likely to work in occupations with greater autonomy and decision-making responsibilities, will instil values of self-direction, communication and autonomy in their children. Parallels with Kohn can also be noticed in the different parenting styles observed in the work of Annette Lareau (2003). She suggests that higher-SEP parents adopt 'concerted cultivation' parenting approaches that instil

children with the skills and confidence to engage effectively with adult figures such as teachers, thereby allowing them to communicate their needs in the educational environment and obtain adequate support and engagement from teachers. By contrast, lower-SEP parents are less likely to contest the authority and evaluations of teachers, she argues, which leads to similar patterns of engagement among their children with important consequences for educational development. Within school settings, this translates into children failing to communicate well with teachers and being less able to contest poor evaluations of their ability, leading to lower performance and frustration. In addition, lower-SEP parents are also more likely to adopt a ‘natural growth’ parenting style that is less likely to develop key skills and competences in their child.

Such subcultural literature seeks to explain socio-economic inequalities in education as a product of a disconnect between the culture of lower-SEP students and their families and that of middle-class educational institutions and teachers. Yet critics have suggested that subcultural explanations rely on socially-deterministic explanations, giving little scope for individual autonomy and decision-making processes (Furlong 1991). For instance, while cultural capital explanations of lower-SEP poor performance argue that this reflects a disconnect between lower-SEP students and educational institutions and teachers, evidence indicates that SEP gaps in performance manifest themselves from early infancy and long before social behaviours emerge (Feinstein 2003; Heckman 2006; Passaretta, Skopek, and van Huizen 2022). Some studies provide evidence that time in education and in school actually stops gaps from growing further (von Hippel and Hamrock 2019; Passaretta and Skopek 2021) or may even reduce them (Downey, von Hippel, and Broh 2004; Raudenbush and Eschmann 2015). Subcultural explanations also fail to account for the fact that the majority of lower-SEP families value education and hold high academic aspirations for their children (Lareau 2003; Smyth and Banks 2012).

Hybrid explanations

The observed manifestation of primary and secondary effects of social origin indicates that purely individual-level explanations fail to account for the effects of social context or adequately explain why socio-economic inequalities emerge. On the other hand, subcultural explanations cannot account for the repeated finding that the majority of lower-SEP children and their parents actually value education and that there is little evidence to support the contention by advocates of cultural capital theory, that symbolic violence plays a significant role in the creation of educational differentials.

Interactionist explanations

Interactionist perspectives accentuate a more dynamic understanding of the relationship between SEP and academic performance: SEP differentials in education are argued not to be the product of social-determinism or individual attributes, but rather a reflection of how SEP influences individual attributes and vice-versa (Conger and Donnellan 2007).

Interactionist perspectives posit that subcultural processes are therefore not the driving force behind observed inequalities, but rather that factors correlated with SEP, such as financial strain, poverty and resources (both material and immaterial), affect processes at the individual and household level. Such processes are hypothesised to be a function of the home environment, but their effects carry through into the school environment, leading to differentials in student performance and attainment.

Access to resources, both material (e.g. income, assets, etc.) and immaterial (e.g. knowledge, status, education, etc.), have been suggested as one of the ways SEP drives inequalities in education. For instance, parental ability to invest in providing their children with a stimulating home learning environment has been observed to enhance children's academic performance (Yeung, Linver, and Brooks-Gunn 2002), while immaterial

resources, such as time dedicated to parent-child activities, have also been suggested to lead to differentials in child vocabulary attainment and cognitive performance (Hart and Risley 1995). Such processes have been conceptualised in the Family Investment Model, where families with more resources are better placed to make significant investments in the development of their children – an option not available to lower-SEP households who are forced to invest in more immediate family needs (Becker and Tomes 1986; Conger and Donnellan 2007; Layte 2017). Such investments can take the form of direct financial interventions, such as providing children with access to suitable home learning environments and specialised tutoring. However, they can also take the form of environmental and contextual investments that facilitate the child's academic progress, such as providing children with a stable and high-standard of living (e.g. quality housing, nurturing food, security) and living in an advantaged neighbourhood with ready access to good schools and neighbourhood facilities that foster child development (Conger and Donnellan 2007).

It could also be argued that SEP differentials in resources not only affect child educational outcomes through direct and indirect investments in the child, but also have an effect on psycho-social processes within families. Such an explanation has been conceptualised in the Family Stress Model advocated by Conger and colleagues to explain the effect of rural recession in the American Midwest on family processes (Conger et al. 1992, 2002). The Family Stress Model suggests that household experiences of financial strain lead to negative psychological and behavioural repercussions in both parents and children. For parents, the financial strain leads to the internalisation of stress in the form of depression and anxiety. This in turn results in a decline in between-parent relationships via increased parental conflict, and poorer quality parenting because of the adoption of less-nurturing, harsher and inconsistent parenting styles (Conger 1994; Simons et al. 1994). This home

environment leads, in turn, to children internalising (e.g. depression, low self-esteem and anxiety) and externalising (e.g. conduct, hyperactivity) behaviours, the development of which affects the child's ability to perform and engage effectively in an educational environment.

Relative Risk Aversion

Various studies have observed support for both Family Investment and Family Stress hypotheses in explaining differentials in student academic performance, indicating that both processes can occur simultaneously and need not be viewed as mutually exclusive (Cooper and Stewart 2021; Layte 2017). Interactionist explanations for the development of secondary effects have also been posited, suggesting that individual decisions reflect evaluations of risk that are themselves influenced by the SEP of the actor making them.

Theories of bounded rationality, for instance, suggest that student decision-making is rational, but that what is perceived by the actor as rational interacts with his/her SEP, with socio-economic differences in the availability of information and the actor's ability to utilise that information in his/her decision-making leading to different decisions being reached, *ceteris paribus*. Breen and Goldthorpe (1997) developed a bounded rationality framework to explain SEP differentials in educational decision-making which they call Relative Risk Aversion (RRA). RRA hypothesises that student decision-making is motivated by an underlying aversion to downward social mobility, with what is perceived as downward social mobility determined by the SEP of the person making the decision. The practical manifestation of this is that higher-SEP students are obliged to make ambitious educational choices (e.g. to attend higher education) net of ability, as failure to do so will lead to downward social mobility (Breen, van de Werfhorst, and Jæger 2014; Breen and Yaish 2006). For lower-SEP students, for whom more ambitious educational

choices are not necessary to maintain social stability, the underlying motivation to make such choices is weaker. Furthermore, the perceived cost of such ambitious choices, such as (in the case of prolonging education beyond compulsory level) earnings forgone, time, risk of failure and direct financial costs incurred, can make this a less attractive option for lower-SEP students. While these costs also exist for higher-SEP students, their greater ability to absorb those costs, coupled with the need to make these ambitious selections to avoid SEP demotion, means these costs are not viewed as prohibitive.

Do schools moderate these mechanisms?

The landmark Coleman Report of 1966 observed that variation in school resources could not explain social patterns in children's educational attainment. Instead, these differences in attainment were predominantly driven by the racial and socio-economic background of young people (Coleman 1966). Subsequent studies have found similar findings, with variation in student social background explaining more of the discrepancy in educational outcomes than disparity between schools. This spawned a body of literature that discounted 'school effects' entirely and assumed instead that children, by and large, attend a 'common school' of roughly the same quality, with variation at the school level predominantly reflecting the socio-economic composition of the student body (Downey et al. 2004). However, even if between-school differences account for little of the disparity in student performance and attainment once students' socio-economic considerations are accounted for, variation within-schools can still potentially moderate the socio-economic association with educational outcomes by influencing the environment in which these mechanisms occur. Quasi-experimental literature from the United States (e.g. Leventhal and Brooks-Gunn 2004; Schwartz 2011) has, for instance, observed that students from lower-SEP backgrounds who are randomly assigned to schools with a more advantaged student body perform better than their matched lower-SEP peers, indicating that schools do

moderate performance net of individual social background. Observational studies (e.g. Dumay and Dupriez 2008; Smyth 1999) have also arrived at a similar conclusion.

Willms and Raudenbush's (1989) distinction between Type A and Type B effects provides a useful framework by which to disentangle the socio-economic characteristics of students from the effect of the schools they attend. Type A effects reflect the average performance of a student in a school relative to the mean across schools, and it can be anticipated to reflect the socio-economic characteristics of the school's student intake. Type B effects, by contrast, reflect how the average student performs in a school relative to other schools with the same student body characteristics, with school practices, and not composition, thereby explaining the difference.

While providing a useful theoretical categorisation by which to distinguish between the effect of school composition and school effects net of composition, Type A and Type B effects have in practice proven difficult to measure, with the clustering of students within schools making it difficult to accurately ascertain where the effects of students' socio-economic background end and school effects begin. Furthermore, while multilevel models can account for student nesting within schools, failing to account for patterns of student selection into schools can lead to inaccurate estimation of school effects on account of ecological correlation (Harker and Tymms 2004). While experimental research, such as randomised control trials, could remove this correlation, the ethical and practical limitations of such an approach in social science make its adoption unfeasible.

Data

The studies in this thesis utilise data from Cohort98 of Growing Up in Ireland, an ongoing and nationally representative longitudinal dataset of children in Ireland. The dataset's initial sample constituted 8,568 nine-year-old students, or approximately one in every

seven nine-year-old children in the Republic of Ireland in 2007, their families, school principals and (in Wave 1) their teachers. The sample declined to 7,525 (88%) in Wave 2 (2011) and 6,216 (73%) in Wave 3 (2015). 70% of the initial sample were present in both Waves 2 and 3, leaving a balanced sample of 6,039. Certain analyses were conducted on data further conditioned to, for instance, only include children who did not switch schools between Waves 2 and 3. The sample size and conditioning approaches for each analysis are described in detail in the analytical strategy section of each study.

A unique aspect of the Growing Up in Ireland dataset is how the data collection period of the first three waves coincides with a period of major economic change in the country. The Great Recession resulted in severe changes to the social and economic landscape of Ireland, turning Ireland from a country of net immigration and a vibrant economy in the period immediately prior to the recession, to one of net emigration, severe economic contraction, 15% unemployment and the state being in receipt of a financial bailout at its height (Eurostat 2021). Furthermore, the recession was notable in that few households were left untouched by its fallout, with observational studies indicating that the majority of households experienced significant negative fallout from the economic contraction (Maître, Russell, and Smyth 2021; Reinhard et al. 2018; Watson et al. 2016), with the average household income dropping 17% during the recession (Layte and McCrory 2018).

The data collection for the Growing Up in Ireland Child cohort took place in the years immediately prior to (2007), during (2011) and after (2015) the Great Recession in Ireland, providing detailed insights into the social and economic fluctuation of the period and its effect on Irish households. Furthermore, while changes in economic and social factors tend to reflect socio-economic differences in periods of stability, the severity and suddenness of the economic contraction led to variation within socio-economic strata, thereby lending itself to the disentangling of effects normally correlated with SEP from SEP itself.

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Study I: When and why do socio-economic differences in student disaffection emerge? A longitudinal study from age 9 to 17/18.

Abstract

It has long been recognised that differentials in student disaffection with schooling are a major contributor to educational inequalities. We propose an explanatory model where social class differences in resources and parenting practices reduces the young person's educational performance with consequences for self-esteem which results in the emergence of disaffection, as measured through conduct. We test this theory using longitudinal analysis of data from Cohort98 of the Growing Up in Ireland study, a nationally representative sample of children from Ireland. Our results indicate that social class differentials are accounted for after adjusting for performance, while disaffection also has a small effect on conduct net of confounders. However, contrary to our hypotheses, change in maths performance is not associated with change in conduct. We discuss possible reasons for this and alternative theories.

When and why do socio-economic differences in student disaffection emerge? A longitudinal study from age 9 to 17/18.

Research on student variation in educational success has increasingly directed attention to the role of student disaffection with education in determining student performance and outcomes (c.f. Fredricks et al., 2004). Such disaffection can express itself internally, such as through emotional disengagement and frustration with education, and externally via behavioural maladaptation to the academic environment and poor conduct (Skinner et al., 2008, 2009). Understanding the processes that lead to the development of both internalised and externalised disaffection forms an important component of research on educational inequalities. Disaffection has been shown to predict poor student performance and educational outcomes net of cognitive ability, family background and sex differences (J. P. Connell et al., 1995; Wentzel, 1993).

While various explanations for the observed trajectories in student disaffection have been offered by psychological, sociological and anthropological researchers, there has largely been a disconnect between psychological explanations that accentuate differences at the individual level, and sociological and anthropological approaches which seek to explain disaffection through group dynamics, culture and norms. Using longitudinal data from Cohort98 of the Growing Up in Ireland study, this paper proposes an alternative hybrid psycho-social model, whereby socio-economic differences in child and adolescent externalised disaffection (measured as misconduct) emerge in response to poor academic performance, mediated by self-esteem.

Literature

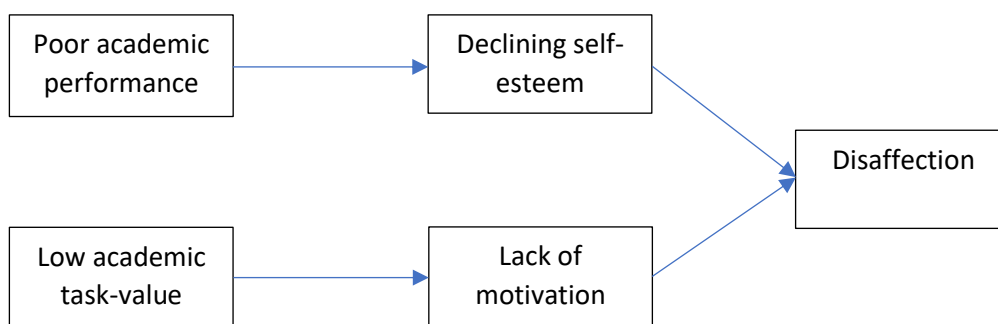
Psychological literature on student disaffection often explores the relationship between student disengagement with education and disaffection (Fredricks et al., 2004; Skinner et

al., 2008, 2009; Symonds et al., 2019). Lack of engagement can arise on account of amotivation, dejection, discouragement and apathy, traits often also associated with student disaffection. Yet disaffection goes beyond mere student disengagement with school, referring rather to how behaviour and emotions reflect a student's maladaptation to education (Skinner et al., 2008, 2009). In contexts where an individual is disengaged from an activity, the normal reaction of the individual is to seek avoidance or exit. However, in situations such as compulsory education where voluntary avoidance is difficult, forced participation can also lead to emotional and behavioural disaffection, manifested via frustration, poor conduct and ritualistic as opposed to engaged participation (Finn, 1989; Finn et al., 1995). Skinner (2008) categorised disaffection as taking both internal and external forms, with the internal referring to the emotional traits of disaffection, such as student boredom, frustration, anxiety and self-blame. These internal dynamics of disaffection can in turn lead to students externalising their disaffection in a more visible manner, through passivity, inattentiveness, unpreparedness, disruptive behaviour and giving up.

Various psychological hypotheses have been posited for the emergence of disaffection, one of which is that disaffection develops among students who lack academic motivation. Amotivation explanations draw largely on the concept of Expectancy-Value theory (Eccles, 2004; Eccles-Parsons et al., 1983), which suggests that motivation arises from the value students gain (or perceive themselves to gain) from a task. For students who perceive school to hold little value for either their personal well-being or as a means for obtaining their long-term goals, education is less likely to motivate them. This lack of motivation can in turn lead to disengagement with education and, in the absence of exit options, the development of disaffection.

Another influential hypothesis posits that student perceptions of self-efficacy determine disaffection (Dweck & Leggett, 1988; Elliot & Dweck, 2005). Self-efficacy reflects students' belief in their ability to act and perform in ways necessary to reach their specific goals (Bandura, 1997). The model put forward by Dweck and colleagues argues that the emergence of disaffection reflects students' self-efficacy, with students who hold greater self-efficacy more likely to engage proactively with education, while conversely students with lower self-efficacy will attempt to avoid challenges or engage with them half-heartedly – aspects of disaffection.

Figure 2. 1 Psychological models of disaffection: Self-efficacy model (top) and Task value model (bottom).



Psychological research has largely addressed differences in student disaffection through the prism of student amotivation and self-efficacy in school as outlined above (Figure 2.1), theorising that students' poor performance can lead to a loss of belief in their self-efficacy (Dweck & Leggett, 1988), while amotivation may arise from a school-led educational focus that differs from that of the student (Eccles, 2004; Symonds et al., 2019). Such models offer important theoretical frameworks through which the development of disaffection can be evaluated, with a wide array of academic literature offering empirical support to the central tenets of this hypothesis (Usher & Pajares, 2008; Wigfield et al., 2006). However, the predominantly individual-focused nature of the mechanisms proposed in the theoretical models risks failing to account for structural differences in how young

people react to amotivation and self-efficacy. For instance, a student who does not enjoy education may still recognise the value of education and engage effectively with aspects of the education system, such as schools and coursework. Similarly, students who perceive themselves to be of lower academic ability need not necessarily develop internalised or externalised traits of disaffection, but may instead focus on improving their performance through increased effort.

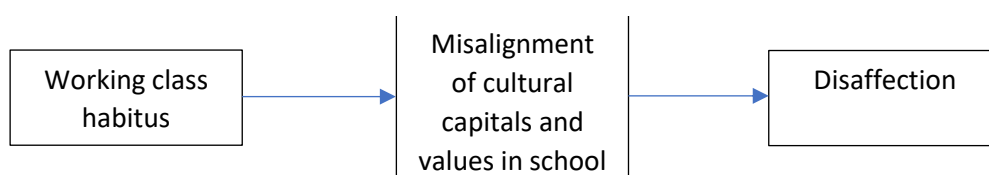
Research on student disaffection has found evidence of pronounced social and demographic variation in disaffection. In particular, studies have indicated that students from lower socio-economic groups (henceforth SEG) and particularly lower-SEG boys, are more likely to be disaffected than their higher-SEG and female peers (c.f. Wigfield et al., 2006). By focusing on the development of disaffection at the individual level, psychological explanations do not clearly explain how observed SEG and sex differences in disaffection emerge.

These differing social and demographic patterns of student disaffection have led to sociological and anthropological studies which have sought to explain the effect of the young person's social class in determining the nature of their relationship with teachers and school. Several classic studies have explained poor conduct as a class-subcultural rejection or misalignment between the educational values of teachers and schools and those of young people from lower-SEG backgrounds. This focus on social and cultural factors has been replicated across a number of other cultural dimensions, such as through the development of Black ethnic subcultures in Fuller (1984), Furlong (1984) and Mac an Ghaill (1988) or the gendered subcultures of McRobbie and Gerber (2003), Connell (1982) and Walker (1988). These studies view the cultural background of lower-SEG students as being poorly aligned with the 'cultural capital' the education system expects students to have (Bourdieu & Passeron, 1977; Sullivan, 2007), or else that the class-cultural dynamics

of lower-SEG families leads to an active rejection of education and middle-class educational values (Ball, 1981; Hargreaves, 1967; Willis, 1993).

Perhaps the most renowned class-subcultural argument is put forward in Willis' (1993) classic study of working-class boys' experiences of education, which viewed disaffection as emerging from rejection of education and opposition towards authorities in education. This was characterised by a counterculture which in turn resembled the culture of the industrial workplaces the 'lads' (disaffected and troublesome boys) were destined to end up working in. Such behaviour was tolerated and even encouraged by parents who went through similar experiences themselves, leading to a cycle of working-class reproduction. Similar explanations have been found in other classic sociological texts on the topic such as Hargreaves (1967) and Ball (1981) who looked at the role of ability grouping in schools as a precursor to the development of strong countercultures against school, education and authority among less advantaged students.

Figure 2. 2 Subcultural model of disaffection.



Described by Furlong (1991) as 'Durkheim's children', such sociologists provide cultural explanations for observed phenomena (Figure 2. 2). Student emotional disillusionment with school (i.e. internalised disaffection) and poor conduct (i.e. externalised disaffection) are viewed not as the result of psychological processes, but rather emerge as a normal reaction to the social circumstances the student is dealing with, and a rejection of norms and values that are alien to those of the student's social background. Yet such approaches largely ignore the importance of psychological considerations by attempting to explain

observed phenomena through a purely cultural dimension. Not all lower-SEG students are disaffected with education, indeed, studies suggest that a majority of lower-SEG families value and support their children's education, even if their support takes on different approaches to those of higher-SEG families (Lareau, 2003). Students do not reject school merely on account of hailing from a working-class background (Willis, 1993), being male (Walker, 1988; Willis, 1993) or because of misalignment with the cultural requirements of education (Bourdieu & Passeron, 1977). Instead, the greater prevalence of disaffection among lower-SEG young people may instead reflect events and circumstances outside of the school environment which nonetheless shape their behaviour and motivations within school.

Children from lower-SEG backgrounds have long been found to perform worse academically, on average, than their higher-SEG peers (c.f. Erikson et al., 2005; Jackson et al., 2007) with differentials appearing from early infancy (Feinstein, 2003; Layte, 2017), indicating that the home environment contributes to the development of these differences even before the child enters school and engages with the education system. Such differences therefore cannot be adequately explained as the result of a student's class-cultural rejection of or misalignment with structured education.

While acknowledging that disaffection does not occur in an individualised vacuum without social influences (socio-cultural effects), explanations for the emergence of student disaffection must also account for differences that are missed through a purely cultural explanation. In this study, therefore, we seek to account for the development of differences in externalised student disaffection, measured via conduct, through a hybrid psycho-social 'self-esteem' model that explains the SEG patterning in student disaffection. As students from lower socio-economic backgrounds are more likely to struggle in school relative to their more advantaged peers (primary effects), we anticipate this will negatively affect

their self-esteem. Obligated to partake in an educational system that they struggle to succeed in, lower-SEG students may be more likely to externalise disaffection as a means of maintaining their self-esteem.

Self-Esteem Model

Our proposed alternative, hybrid model seeks to account for both changes in factors within individuals highlighted by psychological models, while also suggesting potential reasons for observed differences by SEG. Central to this proposed model is the role of academic performance, and how poor individual academic performance can lead to the young person becoming disaffected with education, with self-esteem mediating the relationship.

Differences in student disaffection by SEG would likewise be explained in such a model via the well-documented differences in academic performance that occur by SEG. A graphical representation of the model is included in Figure 2. 3.

The pattern of lower educational outcomes among students from more disadvantaged social backgrounds is often presented as resulting from the combination of the primary and secondary effects of family of origin (Boudon, 1974). Family of origin influences student performance in education through a variety of ‘primary effects’ of social background (Layte, 2017; Shavit & Blossfeld, 1993) such as differentials in parental resources and human capital. Family of origin also influences educational attainment through the different choices taken by lower-SEG students in education compared to their higher-SEG peers, net of performance (secondary effects).

Secondary effects can naturally be affected by the student’s conduct and engagement with education, both expressions of student disaffection, with students who struggle within classroom settings more likely to opt for non-school alternatives when the opportunity arises (Breen & Goldthorpe, 1997; Symonds et al., 2019). Similarly, a link could be argued

to exist between primary effects and student conduct. Students from lower socio-economic backgrounds often perform less-well academically compared to their higher-SEG peers (van de Werfhorst & Hofstede, 2007) and research shows that poor conduct in the classroom contributes to this (Wentzel, 1993).

However, it may be that causality travels in the other direction, with worse student performance resulting in poorer student conduct. Theories of self-concept (Covington, 1992) for instance, argue that students who struggle academically in school will attempt to bolster self-esteem by putting less effort into their education, providing themselves with the ability to explain away their poor performance as the result of disinterest as opposed to inability. Attribution theorists such as Dweck (2002) have similarly theorised that students, especially when younger, react to experiences of perceived success and failure and can potentially view education as an entity that is unlikely to improve with increased effort following prior ‘failures’. Where students perceive a combination of effort and failure as implying low ability, the young person will seek to shore up their self-esteem by purposely reducing their effort and engagement with education in order to explain away failure as resulting from lack of interest as opposed to ability (Covington, 1992; Dweck & Leggett, 1988). Pomerantz and Saxon (2001) have argued that student perceptions of low ability can have a negative effect on motivation and performance, although they also observed that such perceptions declined as students grew older. As such, we anticipate that student academic performance will be associated with externalised disaffection as measured by student conduct, leading to our first hypothesis.

H1: Academic performance will be positively associated with conduct, while poor academic performance will be negatively associated with conduct.

A class-dynamic can also present itself in such an explanation, with class differences in student response to ‘failure’ in school existing on account of the different values instilled in the child by their parents and class background. Kohn (1963, 1977) theorised that parental values differed by class on account of the occupations of the parents, with middle-class parents’ values accentuating the importance of self-direction and autonomy, while working-class parents are more likely to instil values of conformity to external proscriptions in their children, placing emphasis on how one’s performance is judged by others. A similar argument has been made by Lareau (2003) and Lareau and Weininger (2003), who observed that students and their parents from a lower-SEG had a propensity to passively accept the recommendations and conclusions of teachers, while higher-SEG parents actively engaged with and contested teacher evaluations of their child’s performance. Students from lower-SEG backgrounds would therefore conceivably be less likely to query teacher and school assessment of their educational performance, viewing it to be an authoritative reflection of their innate ability, while higher-SEG children would be more likely to perceive such assessments of their ability as a temporal reflection of ability and within their own autonomy to change (Davis-Kean, 2005). We therefore hypothesise that the strength of the effect of student performance on conduct will be conditional on the social background of the student:

H2: The positive association between academic performance and conduct will be stronger for working-class students compared to middle-class students.

Dynamics of self-esteem and conduct can therefore reasonably be expected to reflect class-level dynamics as well. For lower-SEG children who attribute their worse performance to lower ability, failure is more debilitating and more likely to lead to internalised low self-esteem. Lower-SEG pupils may respond to this situation by bolstering their self-esteem and standing among peers via visible rejection of education through worse conduct and

behavioural disaffection. For higher-SEG students who are less likely to perceive teacher and school assessments of ability as a definitive reflection of innate ability, students will instead opt for alternative strategies to rectify such failures, such as increased effort in order to improve educational performance.

Following the theory that disaffection arises as a means of maintaining self-esteem, we therefore expect that low self-esteem will mediate the effect of poor student performance on disaffection. Furthermore, we anticipate that self-esteem will be more closely tied to performance for lower-SEG students, who are more likely to view performance as reflective of innate ability, versus higher-SEG students who are more likely to challenge evaluations of their ability. Hypotheses three and four therefore look at the effect of educational performance and self-esteem on conduct, and the moderating effect of SEG on the association of self-esteem on conduct:

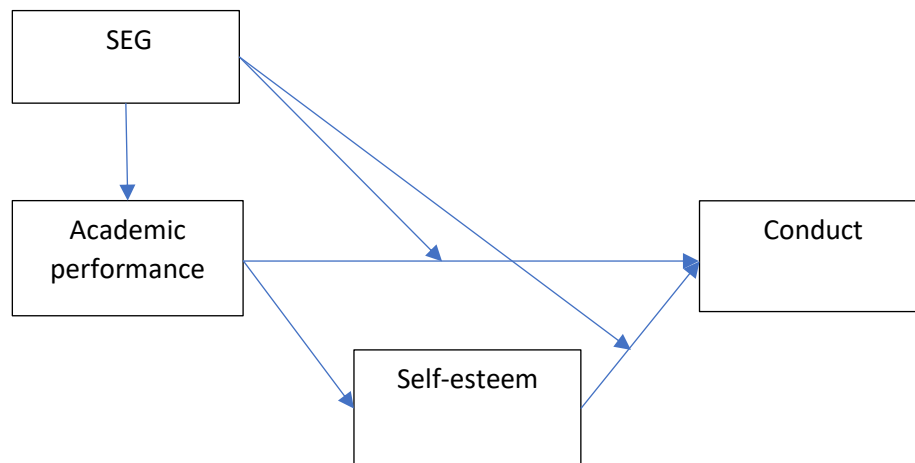
H3: The positive association between student academic performance and student conduct will be partly mediated by student self-esteem.

H4: The association between positive student self-esteem and student conduct will be strongest for lower-SEG students.

Subcultural explanations of SEG differentials in disaffection highlight the incompatibility of working class culture and those of the education system. Instead, we hypothesise that these differences reflect factors correlated with SEG, such as academic performance and self-esteem. We therefore anticipate differences by SEG will be fully accounted for once these factors are adjusted for:

H5: SEG differences in student conduct will be fully explained by academic performance and self-esteem.

Figure 2. 3 Hybrid 'Self-esteem' model of disaffection.



Data and Analysis Strategy

Sample

This paper used data from the first three waves of the Growing Up in Ireland Child Cohort (GUI), an ongoing and nationally representative longitudinal study of children, their parents and their schools in Ireland. The first wave of interviews took place at the end of 2007 and the start of 2008, with participants subsequently re-interviewed in 2011-12 (Wave 2 – age 13) and 2015-16 (Wave 3 – age 17/18). The sample was drawn from a total resident population of approximately 56,500 nine year olds registered in the 2006 census, with the sample size of 8,568 representing approximately 14% or one in every seven nine-year-old children residing in Ireland. Students were selected in a two-stage process: in the first stage schools were selected, while in the second stage students were selected from within schools. With the majority of primary schools in Ireland having fewer than 40 nine-year-old students, increasing larger schools' probability of selection was necessary in order to build a representative sample. In the first selection stage, therefore, primary schools with fewer than 40 nine-year-old students were selected on a systemic stratified basis (by county, disadvantaged status, denominational status, categorical size and gender mix), while schools with more than 40 nine-year-old students were selected on a probability

proportionate to size approach where larger schools had a greater probability of selection. The second stage of the process counterbalanced the increased probability of larger schools being selected, with the selection probability of a student being included in the study being negatively related to the number of students in the school, while all nine-year-old students in schools with less than 40 nine year olds were eligible for selection. Interviews were conducted with study children and their parent(s)/guardian(s) at home, and with teachers (Wave 1 only) and principals in schools. Parent(s)/guardian(s) were self-defined as primary (PCG) and secondary caregivers (SCG) in terms of the level of care provision to the study child, with the primary caregiver in almost all instances being the study child's mother (biological or otherwise), with the secondary caregiver being the spouse/partner of the primary caregiver. Of the 8,568 families included in Wave 1, 7,525 were re-interviewed in 2011-12 for Wave 2 (88%), and 6,216 in Wave 3 (73%). Of the 6,216 respondents in Wave 3, 6,039 were present in all three waves, providing us with our final longitudinal sample.

Dependent variable

Externalised disaffection (Conduct) Student disaffection could be conceptualised as a latent construct, informed by various internalised and externalised dimensions. Skinner (2008) conceptualised disaffection as expressing itself in internalised forms such as disinterest, and behavioural forms such as through poor conduct. As we anticipate that both internalised and externalised forms are realisations of the same underlying construct of disaffection, we seek to predict only externalised disaffection in this study, omitting any measures of internalised disaffection to avoid the risk of collider bias. We utilise conduct as a measure of externalised disaffection, using the conduct problems subscale of the Strengths and Difficulties Questionnaire (Goodman, 1997). The Strengths and Difficulties Questionnaire (SDQ) scale measures the prosocial behaviour and psychopathology of

children through five subscales of five questions; this was completed by the primary caregiver in all waves, and separately by the study child's teacher in Wave 1. The conduct problems subscale consists of five questions measuring student conduct and disruptive behaviour, ranked on a scale of 0 to 10, where higher values indicate greater conduct difficulties.

Mediator variable

Student self-esteem

Student self-esteem was measured in Waves 1 and 2 using the Intellectual subscale of the second edition of the Piers-Harris Children's Self-Concept Scale (Piers & Herzberg, 2002). The intellectual subscale consists of 16 questions that require a yes/no response, with total scores ranging from 0 to 16, where lower scores indicate lower self-esteem. Piers-Harris was not included in Wave 3, with students' self-esteem being measured via the Rosenberg Self-Esteem scale instead. The Rosenberg Self-Esteem scale utilised in GUI Wave 3 comprised of six items rated on a 4-point scale, ranging from 1 (strongly agree) to 4 (strongly disagree). In order to develop a scale by which to measure self-esteem that accounted for two different measures being used, we created self-esteem percentiles for both Piers-Harris and Rosenberg scores, where 100% indicated the highest possible self-esteem ranking and 0% the lowest possible self-esteem ranking.

Independent variables

Household class Household class was derived from the current or, when the respondent was economically inactive, previous occupation of the Primary and Secondary caregiver. Seven categories of occupation were originally derived: *Higher Managerial and Professional, Lower Managerial and Professional, Administrative, Skilled Manual, Semi-skilled, Unskilled, and All others gainfully occupied and unknown*. As the *Semi-skilled*,

Unskilled and *All others gainfully occupied and unknown* categories had low numbers of observations, they were collapsed into a single *Semi and Unskilled* category. Household class was derived using the dominance approach, whereby the higher of the two parents' social class categories (where relevant) is used for determining the household social class.

Sex The biological sex of the student was measured using a dummy variable, where 1 = female and 0 = male.

Academic Performance Student academic performance was measured through performance in standardised maths tests. Maths performance was used as a measure of student academic performance as, unlike language and reading ability tests which measure verbally-mediated cognitive processes (Lohman, 2005), performance in mathematics provides a largely culture-free measure of academic ability.

In Waves 1 and 2, maths performance was measured using the standardised Drumcondra Maths test (Wave 1) and Drumcondra Numerical Ability test (Wave 2), both designed to test the age-relevant maths ability of students in the Irish education system. For Wave 3, where no Drumcondra maths scales were included, we developed a maths score by using student maths performance in the standardised Junior Certificate exams that students take at the end of the third year in Irish secondary schools. In order to construct the scale, we weighted for the different difficulty levels students have the option of sitting their Junior Certificate mathematics exam at, with higher performance at a higher difficulty level being given a higher performance score than a high-performance score at a lower difficulty level. To compare performance across waves, we created a percentile scale in each wave, where 100% indicated the highest possible math performance ranking and 0% the lowest. Owing to the categorical nature of the original measures whereby performance was rounded into performance bands, the mean rank is close to, but not 50%, in most instances.

Teacher-student relationship variables In order to ascertain whether parent-reported child conduct reflected child conduct in the school, the relationship between student conduct and teacher-student relationships were measured. Teacher-student relationships were measured in Waves 2 and 3 using student responses to the question, '*You are told by your teacher that your work is good*', with answers given on a four-point scale ranging from *Never* to *Very often*. The variable is not included in the multivariate models.

Attitudes to School The young person's self-reported liking of school was created by categorising student responses to the question, '*What do you think about school?*' Given the response scale utilised differed in each wave, we collapsed the categories to create a dichotomous variable where strong positive appraisal of school implies the student *always likes school*, while other responses are categorised as the student *not always liking school*. Given this measure could be considered as the internalising element of underlying latent construct of disaffection which conduct is also a part of, this variable is not included in the multivariate models to avoid the risk of overcontrolling the models.

Control variables

Control variables consisted of household type (single/two parent, number of siblings), whether the study child had a chronic illness and the employment status of the primary caregiver.

Treatment of missing values

Missing values ranged from 0.81% of the sample (for SDQ conduct in Wave 3) to 5.28% (for self-esteem in Wave 1). As missing data has the potential to bias results, both dependent and independent variables were imputed using multiple imputation by chained equations (MICE) (M= 20), with model variables and auxiliary variables such as parental education used as predictors. To confirm that the observations were missing at random

(MAR), we estimated models with both multiple imputation and with complete case analysis, with no major differences observed.

Weights

Of the original 8,568 households sampled in Wave 1 of Cohort98, 6,039 were present in each of the subsequent two waves, amounting to 70.5% of the initial sample. This inter-wave attrition was not random in nature, raising issues of potential sample selectivity in our analytical sample. To adjust for non-random attrition, analyses were estimated using population weights developed by the Growing Up in Ireland research team to account for inter-wave attrition and to ensure that the structure of the sample reflected that of the wider population. Weights were computed using background variables: *PCG educational attainment, Family structure, PCG age, PCG and SCG economic status, Family income quintile, PCG and SCG social class, Ethnicity and Child's sex.*

Methods

Fixed effects would allow us to control for all observed and unobserved time-invariant heterogeneity through differencing, with the use of only within-individual change effectively treating the respondent as his/her own control. However, the advantage of fixed effects in controlling for all between-individual differences, also limits its usefulness in estimating the effect of time-constant factors on the dependent variable. This makes a fixed effects estimator incompatible with this analysis, as SEG – a key variable of interest – is time-invariant. While the adoption of a random effects model would allow for the estimation of a model with both time-variant and invariant variables, estimation is only accurate if there is no correlation between the unexplained time-invariant heterogeneity and time-variant predictors – the random effects assumption. To test whether the random effects assumption held, we ran a Hausman test, with the resultant rejection of the null

hypothesis indicating that the assumption was violated and that a random effects estimator would yield biased results.

These limitations were overcome through the adoption of the hybrid, or between-within, model which allows for accurate model estimation with both time-variant and invariant variables through the inclusion of cluster (i.e. within-individual) means of time-variant predictor variables which accounts for the correlation between predictors and unexplained time-invariant heterogeneity (Allison, 2009). Our model was therefore specified as following:

$$y_{it} = \alpha + \beta_1 \ddot{x}_{it} + \beta_2 z_i + \beta_3 \bar{x}_i + \mu_i + \varepsilon_{it} \quad (1)$$

$$\text{where } \ddot{x}_{it} \equiv x_{it} - \bar{x}_i$$

where y_{it} specifies the SDQ conduct score for child i at time t , $\ddot{x}_{it}$ is the vector of cluster de-meaned time-variant predictors that vary within and between individuals, z_i is the vector of time-invariant variables that vary only between individuals, $\bar{x}_i$ is the mean of time-variant variables within individuals (i.e. cluster mean), μ_i is the unexplained between-individual heterogeneity, and ε_{it} is the idiosyncratic error. The inclusion of cluster means ($\bar{x}_i$) picks up the correlation between the unexplained time-invariant heterogeneity μ_i , and the vector of time-variant predictors x_{it} . By de-meaning time-variant predictors ($\ddot{x}_{it}$) and thereby ensuring that the cluster means of all time-variant predictor variables are zero, we can also accurately estimate all between-cluster differences (Allison, 2009; Antonakis et al., 2021).

We run five models in a sequential step-wise approach:

Model 1: Year + Household class + Sex + Employment + Household type + Chronic illness

Model 2: Model 1 + Maths performance

Model 3: Model 2 + Maths performance X Household class interaction

Model 4: Model 3 + Self-esteem

Model 5: Model 4 + Self-esteem X Household class interaction

Model 1 is the starting confounder-only model, evaluating the effect of household class and sex on child conduct, net of confounders. Model 2 adjusts Model 1 for math performance to ascertain the direct effect of maths performance on student disaffection, testing H1. The subsequent model includes an interaction between maths performance and class, in order to test H2. Adding self-esteem as the mediator in Model 4 allows us to test H3 by assessing whether the effect of academic performance on conduct is mediated by self-esteem, while the inclusion of an interaction between self-esteem and household class in Model 5 tests whether the effect of self-esteem on child conduct varies by SEG (H4). Lastly, the adoption of hybrid models further allows us to evaluate the extent to which class differences in student conduct remain after adjusting for maths performance and self-esteem (H5).

Results

Descriptive results

Table 2. 1 provides the summary statistics of the sample. Sex is nearly evenly split between boys and girls, while over half of the students in the sample come from two-parent families with three or more children. The *Lower Managerial and Professional* class is the dominant class (41%), whilst the *Semi and Unskilled* class is the least prevalent (13%). The remaining sample is largely evenly distributed across the *Higher Managerial and Professional*, *Administrative* and *Skilled Manual* classes.

Table 2. 1 Summary statistics of model variables. Note: data unweighted and unimputed.

	Min.	Max.	n	Wave 1 Mean/Prop.	SD	n	Wave 2 Mean/Prop.	SD	n	Wave 3 Mean/Prop.	SD
SDQ Conduct	0	10	6030	1.21	1.41	6038	1.05	1.35	5990	0.95	1.26
Female	0	1	6039	0.51							
Household type			6039			6039			5993		
Single parent, 1 or 2 children	0	1		0.07			0.08			0.12	
Single parent, 3 or more children				0.03			0.04			0.03	
	0	1									
Couple 1 or 2 children	0	1		0.38			0.46			0.58	
Couple 3 or more children	0	1		0.53			0.42			0.27	
Household class			6039								
Higher managerial and professional	0	1		0.15							
Lower managerial and professional	0	1		0.41							
Administrative	0	1		0.19							
Skilled manual	0	1		0.13							
Semi and unskilled	0	1		0.12							
PCG employment status			6039			6039			6039		
Working	0	1		0.59			0.64			0.70	
Education	0	1		0.01			0.01			0.01	
Unemployed	0	1		0.01			0.03			0.02	
Home duties/retired	0	1		0.37			0.30			0.22	
Other	0	1		0.01			0.02			0.05	
PCG education			6039								
None to lower secondary	0	1		0.15							
Upper secondary	0	1		0.31							
Non degree	0	1		0.26							
Primary degree	0	1		0.18							
Postgraduate degree	0	1		0.11							
Math performance, percentiles	1	100	5977	51.09	28.57	5790	48.95	28.78	5835	41.91	26.23
Self-esteem, percentiles	1	100	5720	45.26	27.01	5961	45.43	26.66	5955	46.48	28.56
Chronic illness	0	1	6039	0.10		6037	0.10		5992	0.17	
Student always likes school	0	1	6017	0.25		5943	0.66		6029	0.79	
Student told work is good	1	4				5986	2.00	0.76	6033	2.05	0.70

Table 2. 2 provides the average SDQ conduct scores at each wave for key grouping variables with their confidence intervals. For all grouping variables, mean SDQ conduct scores decrease from Wave 1 to Wave 3, indicating that conduct improves with time. Average conduct scores are higher (worse) among children in lower classes, albeit the differences across classes are small with all classes reporting low SDQ conduct scores on average. Children from single-parent families have poorer SDQ conduct scores on average than two-parent families. In addition, smaller families with less than three children have better mean conduct scores than larger families. Children whose primary caregiver was in employment or in education in Wave 1 had the lowest mean SDQ conduct score in all waves, while similarly students with higher-educated primary caregivers exhibited better conduct in all waves than their peers with lower-educated primary caregivers.

Table 2. 2 Mean SDQ Conduct scores and confidence intervals for key demographic variables. Note: data weighted and imputed.

	Wave 1			Wave 2			Wave 3		
	<i>Mean</i>	<i>Lower CI</i>	<i>Upper CI</i>	<i>Mean</i>	<i>Lower CI</i>	<i>Upper CI</i>	<i>Mean</i>	<i>Lower CI</i>	<i>Upper CI</i>
Female	1.260	1.208	1.311	1.155	1.105	1.205	1.045	0.999	1.091
Male	1.411	1.356	1.467	1.217	1.163	1.272	1.054	1.005	1.104
Household type									
<i>Single parent, 1 or 2 children</i>	1.583	1.422	1.743	1.339	1.199	1.479	1.233	1.130	1.336
<i>Single parent, 3 or more children</i>	1.922	1.649	2.195	1.699	1.456	1.941	1.829	1.516	2.142
<i>Couple 1 or 2 children</i>	1.203	1.146	1.260	1.063	1.012	1.113	0.905	0.867	0.943
<i>Couple 3 or more children</i>	1.299	1.247	1.350	1.195	1.139	1.252	1.114	1.045	1.183
Household class									
<i>Higher managerial and professional</i>	1.583	1.422	1.743	1.339	1.199	1.479	1.233	1.130	1.336
<i>Lower managerial and professional</i>	1.922	1.649	2.195	1.699	1.456	1.941	1.829	1.516	2.142
<i>Administrative</i>	1.203	1.146	1.260	1.063	1.012	1.113	0.905	0.867	0.943
<i>Skilled manual</i>	1.299	1.247	1.350	1.195	1.139	1.252	1.114	1.045	1.183
<i>Semi and unskilled</i>	1.583	1.422	1.743	1.339	1.199	1.479	1.233	1.130	1.336
PCG employment status									
<i>Working</i>	1.583	1.422	1.743	1.339	1.199	1.479	1.233	1.130	1.336
<i>Education</i>	1.922	1.649	2.195	1.699	1.456	1.941	1.829	1.516	2.142
<i>Unemployed</i>	1.203	1.146	1.260	1.063	1.012	1.113	0.905	0.867	0.943
<i>Home duties/retired</i>	1.299	1.247	1.350	1.195	1.139	1.252	1.114	1.045	1.183
<i>Other</i>	1.583	1.422	1.743	1.339	1.199	1.479	1.233	1.130	1.336

Parent-reported SDQ conduct scores were used as a measure for externalised disaffection. Using child conduct as reported by a parent to measure externalised student disaffection in school raises the concern that student conduct outside of school (as reported by the parent) could be independent of student conduct in school. In order to ascertain whether parent-reported SDQ scores reflected the students' conduct in school, we measured how change in parent-reported SDQ scores matched change in student-teacher engagement as measured through student response to the question, '*You are told by your teacher that your work is good*', on a four-point scale ranging from *Never* to *Very often*. As teacher praise was only measured in Waves 2 and 3, we utilised a change score from Waves 2 to 3, where positive teacher praise change scores imply increased praise for work from Waves 2 to 3, while negative scores imply less praise. Figure 2. 4 shows a linear, albeit weak, relationship between change in SDQ conduct and change in teacher praising the student's work, providing some support for the hypothesis that parent-reported change in SDQ reflects not only students' behaviour in the home, but also their engagement with the teacher in the classroom. This relationship is statistically significant for boys, yet is not so for girls at $p < 0.05$.

Figure 2. 4 Mean change in SDQ conduct scores from Wave 2 to 3, by change in teacher praise for students' work. Pairwise correlation statistics reported, with * indicating statistical significant at $p < 0.05$. Note: data weighted and imputed.

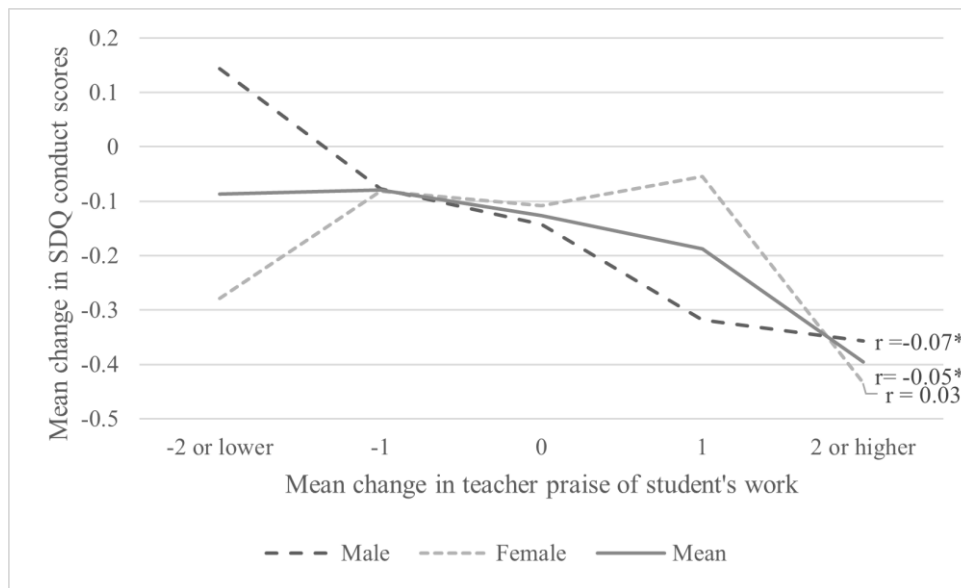


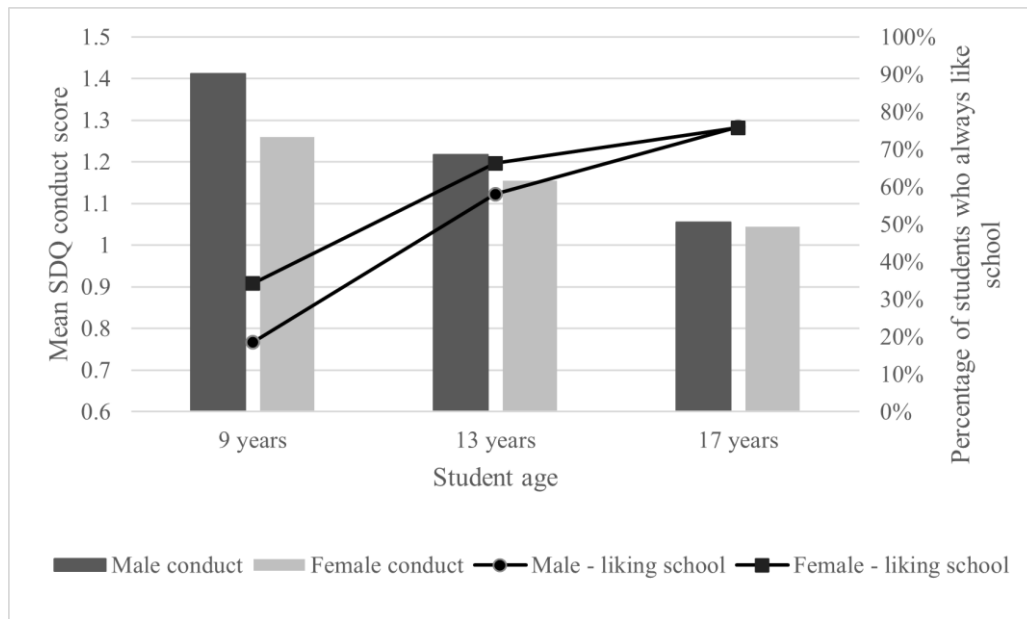
Figure 2. 5 tracks the proportion of students from each household class that indicate they liked school all the time. Children from all classes are less enthusiastic of school at age 9, with higher-SEG students indicating lower satisfaction with school than their lower-SEG peers. While the percentage of students indicating that they liked school increases for all classes at age 13, higher-SEG students on average were now more likely to indicate that they liked school than their lower-SEG peers – a reversal of the order at age 9. This pattern continued into age 17, where students from lower-SEG backgrounds were less likely to indicate that they like school, although 74% of students from semi-skilled and skilled-manual classes still indicated that they did.

Figure 2. 5 Changes in student liking of school from ages 9 to 17, by parental class. Note: data weighted and imputed.



Following our belief that student disaffection is a construct constituting both internalised and externalised dimensions, we anticipate that externalised disaffection as measured by student conduct will be associated with internalised dimensions of student disaffection, such as disengagement with and dislike of school. We therefore anticipate that children indicating that they dislike school will have higher levels of conduct difficulties. Figure 2. 6 shows changes in both conduct scores and liking of school by sex from ages 9 to 17. Boys on average like school less than girls do at ages 9 and 13, and they also exhibit more conduct difficulties on average, at each wave, although the sex gap in conduct narrows as they grow older. Following a similar pattern, the proportion of both boys and girls indicating that they like school increases with age, with the mean difference by sex closing by age 17.

Figure 2. 6 Student conduct and liking of school from 9 to 17, by sex. Note: data weighted and imputed.



If our theoretical model is correct, we should see a positive change in math performance having a direct, positive effect on student conduct. Self-esteem, as a mediator, should likewise have a positive direct effect on student conduct. Figure 2. 7 shows the pooled change in maths performance, binned into quintiles for ease of interpretation, by pooled mean change in SDQ conduct scores for Waves 1 to 3. Contrary to expectations, a positive/negative change in maths performance over time does not lead to a respective positive/negative change in conduct of either boys or girls, although the charts do not account for potential confounders. Figure 2. 8 shows pooled change in self-esteem, again binned into quintiles, by pooled mean change in SDQ for Waves 1 to 3. While there appears to be a clearer relationship between positive change in self-esteem quintile and positive mean change in SDQ conduct, the relationship is not strong.

Figure 2. 7 Change in maths performance quintile by mean change in SDQ, pooled waves 1-3. Note: data weighted and imputed.

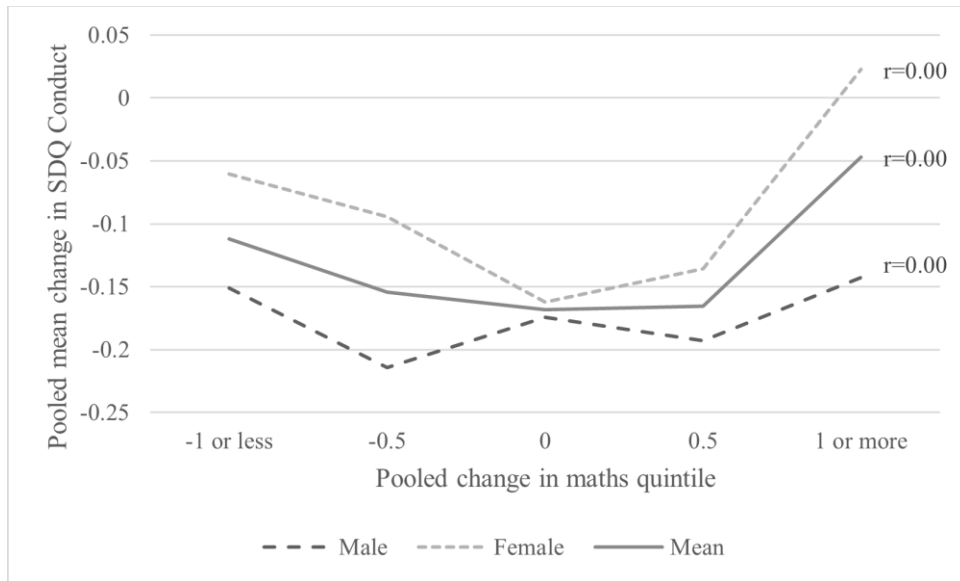
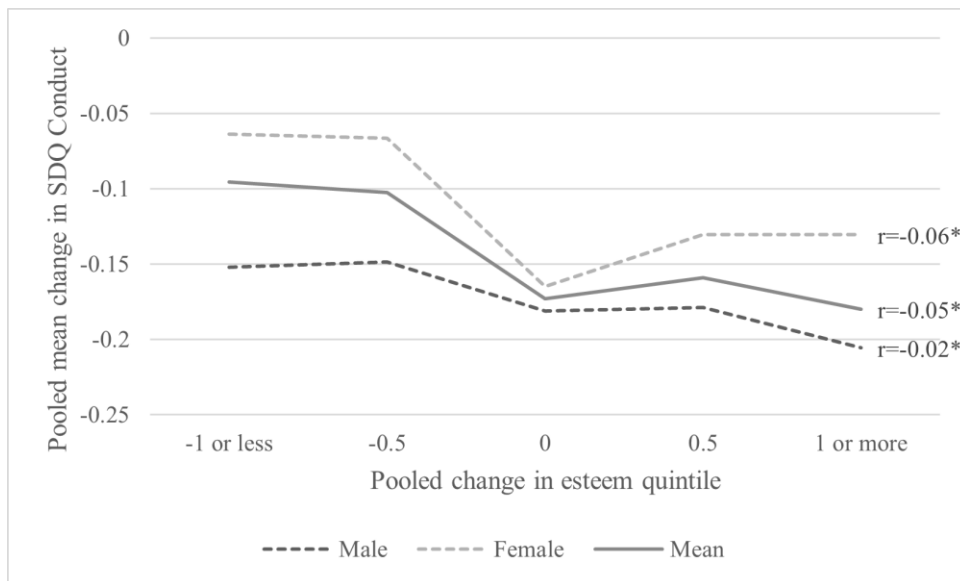


Figure 2. 8 Change in esteem quintiles by mean change in SDQ, pooled waves 1-3. Note: data weighted and imputed.



Multivariate models

Table 2. 3 Hybrid model predicting child conduct. Note: data weighted and imputed.

	I		II		III		IV		V	
	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE
Wave (Baseline 1)										
Wave 2	-0.143***	(0.019)	-0.144***	(0.019)	-0.144***	(0.019)	-0.144***	(0.019)	-0.144***	(0.019)
Wave 3	-0.271***	(0.021)	-0.277***	(0.022)	-0.277***	(0.022)	-0.269***	(0.022)	-0.268***	(0.022)
Time constant variables										
Household class (Baseline: Higher managerial and professional)										
Lower managerial and professional	0.010	(0.047)	-0.061	(0.046)	0.037	(0.126)	0.042	(0.125)	0.021	(0.153)
Administrative	0.106*	(0.053)	-0.034	(0.053)	0.163	(0.132)	0.167	(0.131)	0.201	(0.164)
Skilled manual	0.179**	(0.057)	-0.020	(0.057)	0.135	(0.135)	0.135	(0.134)	0.181	(0.171)
Semi and unskilled	0.161**	(0.061)	-0.039	(0.061)	0.184	(0.136)	0.191	(0.135)	0.198	(0.172)
Female	-0.069*	(0.029)	-0.121***	(0.029)	-0.120***	(0.028)	-0.158***	(0.029)	-0.159***	(0.029)
Deviation from child-specific means										
Chronic illness	0.078*	(0.031)	0.078*	(0.031)	0.078*	(0.031)	0.074*	(0.031)	0.075*	(0.031)
Employment (Baseline employed)										
Education	-0.090	(0.069)	-0.091	(0.069)	-0.093	(0.069)	-0.094	(0.069)	-0.092	(0.069)
Unemployed	0.010	(0.056)	0.012	(0.056)	0.004	(0.056)	0.001	(0.056)	0.002	(0.056)
Home duties/retired	0.007	(0.031)	0.007	(0.031)	0.002	(0.031)	0.005	(0.030)	0.005	(0.030)
Other	-0.166*	(0.068)	-0.164*	(0.068)	-0.163*	(0.068)	-0.159*	(0.067)	-0.158*	(0.067)
Household type (Baseline: Single parent, one or two children)										
Single parent, three or more children	0.114	(0.063)	0.116	(0.063)	0.116	(0.063)	0.134*	(0.063)	0.135*	(0.063)
Couple, one or two children	-0.005	(0.051)	-0.004	(0.051)	-0.006	(0.051)	-0.003	(0.051)	-0.003	(0.051)
Couple three or more children	0.054	(0.055)	0.055	(0.055)	0.053	(0.055)	0.058	(0.055)	0.059	(0.055)
Maths performance			-0.001	(0.001)	0.001	(0.002)	0.001	(0.002)	0.001	(0.002)
Maths X Class (Baseline: Higher managerial and professional)										
Maths X Lower managerial and professional					-0.002	(0.002)	-0.002	(0.002)	-0.002	(0.002)
Maths X Administrative					-0.004	(0.002)	-0.004	(0.002)	-0.003	(0.002)
Maths X Skilled manual					0.001	(0.002)	0.000	(0.002)	0.001	(0.002)
Maths X Semi and unskilled					-0.002	(0.002)	-0.002	(0.002)	-0.002	(0.002)
Esteem							-0.002***	(0.000)	0.000	(0.001)
Esteem X Class (Baseline: Higher managerial and professional)										
Esteem X Lower managerial and professional									-0.003	(0.001)
Esteem X Administrative									-0.004*	(0.002)
Esteem X Skilled manual									-0.002	(0.002)
Esteem X Semi and unskilled									-0.001	(0.002)
Child-specific means										
Chronic illness	0.645***	(0.067)	0.566***	(0.066)	0.563***	(0.066)	0.537***	(0.065)	0.539***	(0.065)
Employment (Baseline employed)										

<i>Education</i>	-0.057	(0.211)	-0.035	(0.205)	-0.025	(0.205)	-0.057	(0.203)	-0.057	(0.204)
<i>Unemployed</i>	0.377*	(0.155)	0.223	(0.151)	0.214	(0.151)	0.238	(0.150)	0.235	(0.150)
<i>Home duties/retired</i>	0.067	(0.042)	0.045	(0.041)	0.044	(0.041)	0.056	(0.041)	0.057	(0.041)
<i>Other</i>	-0.036	(0.145)	-0.086	(0.142)	-0.082	(0.142)	-0.050	(0.141)	-0.046	(0.141)
Household type (Baseline: Single parent, one or two children)										
<i>Single parent, three or more children</i>	0.412***	(0.115)	0.364**	(0.112)	0.359**	(0.112)	0.374***	(0.111)	0.377***	(0.111)
<i>Couple, one or two children</i>	-0.315***	(0.061)	-0.246***	(0.060)	-0.242***	(0.060)	-0.217***	(0.060)	-0.215***	(0.060)
<i>Couple three or more children</i>	-0.169**	(0.063)	-0.081	(0.061)	-0.080	(0.061)	-0.057	(0.061)	-0.056	(0.061)
<i>Maths performance</i>			-0.011***	(0.001)	-0.008***	(0.002)	-0.007***	(0.002)	-0.007***	(0.002)
MathsXClass (Baseline: Higher managerial and professional)										
<i>MathsXLower managerial and professional</i>					-0.002	(0.002)	-0.002	(0.002)	-0.002	(0.002)
<i>MathsXAdministrative</i>					-0.004	(0.002)	-0.004	(0.002)	-0.004	(0.002)
<i>MathsXSkilled manual</i>					-0.003	(0.003)	-0.003	(0.002)	-0.003	(0.003)
<i>MathsXSemi and unskilled</i>					-0.005	(0.003)	-0.005	(0.003)	-0.005	(0.003)
<i>Esteem</i>							-0.008***	(0.001)	-0.008***	(0.002)
EsteemXClass (Baseline: Higher managerial and professional)										
<i>EsteemXLower managerial and professional</i>									0.001	(0.002)
<i>EsteemXAdministrative</i>									-0.001	(0.003)
<i>EsteemXSkilled manual</i>									-0.001	(0.003)
<i>EsteemXSemi and unskilled</i>									-0.000	(0.003)
Constant	1.291***	(0.072)	1.883***	(0.079)	1.739***	(0.127)	2.006***	(0.130)	1.999***	(0.148)
lns1_1_1	-0.132***	(0.014)	-0.167***	(0.014)	-0.167***	(0.014)	-0.178***	(0.014)	-0.178***	(0.014)
lnsig_e	0.008	(0.006)	0.007	(0.006)	0.007	(0.006)	0.005	(0.006)	0.005	(0.006)
Observations	18,117		18,117		18,117		18,117		18,117	
Number of groups	6,039		6,039		6,039		6,039		6,039	

Legend: *p<.05; **p<.01; ***p<.001

Table 2. 3 provides the results of hybrid model. Model 1 provides the starting confounder-only model. Conduct difficulties decrease over time, relative to Wave 1 when respondents were nine years old. Children from *Administrative*, *Skilled manual* and *Semi and unskilled* households both higher conduct difficulties than the *Higher managerial and professional* baseline. In the deviation variables, children whose households' main caregiver described their employment status as *Other* have lower conduct difficulties relative to the *Employment* baseline, while there is no statistically significant effect for change in household type. Being female is also associated with lower conduct difficulties. Time-averaged differences are observed in employment, where *Unemployed* households exhibited higher conduct difficulties relative to the *Employed* baseline, while children in *single parents with three or more children* households also exhibit more conduct difficulties, with children in households with two parents conversely having less conduct difficulties.

The second model attempts to test our hypothesis that poor academic performance is associated with the development of conduct difficulties. After adjusting for maths performance, no class differences remain, while the female coefficient increases. Differences over time in employment status remain stable, while the effect of time-averaged household type declines slightly relative to the confounder only model. While change in maths performance has no effect on child conduct, higher time-averaged maths performance is negatively associated with conduct difficulties.

Our second hypothesis posits that change in maths performance and resultant effect on child conduct would be stronger for children from lower-SEG households. Model 3 tests for this by including an interaction between class and maths performance. Contrary to our hypothesis, there is no significant association between change in maths performance among lower-SEG students and resultant change in conduct, with the interaction

statistically insignificant for all classes. Similarly, there is no statistically significant interaction between time-averaged maths performance and class.

Our third hypothesis anticipated that student self-esteem would explain part of any observed association between student performance and conduct, as students who had lower self-esteem on account of worse academic performance would seek to restore their social standing through active rejection of education via poor conduct. Increase in self-esteem has a statistically significant negative, but small, association with worsening conduct, while higher time-averaged self-esteem is likewise associated with lower levels of conduct difficulties. However, there is only a small decrease in the effect of time-averaged maths performance on conduct after adjusting for self-esteem.

Our final model tested whether there is an association between self-esteem and class, on the assumption that lower self-esteem among lower-SEG students would be more strongly associated with conduct difficulties than for higher-SEG students. There is a statistically significant but small interaction between self-esteem and *Administrative* class, with improving self-esteem in children in *Administrative* households associated with a small decrease in conduct difficulties. However, no such interaction is observed at a statistically significant level for *Skilled manual* and *Semi and unskilled* households.

Discussion

Previous research on student disaffection has often focused on individual traits such as self-efficacy or academic motivation in explaining disaffection, and has ignored the fact that self-efficacy, motivation and disaffection all vary significantly with the social class of the young person. Sociologists and anthropologists have sought to explain this association with social class and have put forward class subcultural explanations that argue that disaffection emerges from class culture, values and beliefs. We have argued that

subcultural explanations of disaffection are socially deterministic and ignore the fact that most working-class families value education and want their child to do well.

In this study, we have sought to test an alternative model that accounts for both between-group differences as accentuated by subcultural explanations, and individual mechanisms posited by psychological ones: social class differences in conduct actually emerge as a result of the effect of worse academic performance on the self-esteem of the young person.

Empirical support for such a model was mixed. Contrary to expectations, change in maths performance had no statistically significant association with change in child conduct.

Increasing self-esteem, however, was associated with declining conduct difficulties - offering some support for our hypotheses. Similarly, the statistically significant interaction between self-esteem and *Administrative* class was in line with our expectation that the effect of the interaction between SEG and self-esteem on conduct is stronger for children from lower-SEG households. However, while change in self-esteem is associated with change in conduct, the size of the effect itself was small, with a standard deviation increase in self-esteem in Model 4 associated with between 3.8% and 4.5% of a standard deviation decrease in conduct difficulties. As such, while an association is observed, variation in conduct cannot be adequately explained by variation in self-esteem.

Furthermore, while self-esteem had a small effect on conduct, this was not on account of educational performance, contrary to our expectation that self-esteem would mediate the relationship of performance on conduct. This could potentially indicate that factors from the home as opposed to the educational environment are influencing self-esteem.

Resource-based explanations of differentials in young people's conduct, such as the Family Stress Model, accentuate the role stressors in the home environment play in affecting the conduct of a child, via parent-relations and parenting warmth (Conger et al.,

1992). Following such a theoretical approach, it could be that self-esteem reflects factors in the home environment such as stress, which affects both the young person's self-esteem and conduct.

The adoption of a hybrid model also allowed for the examination of class differences in child conduct. While the baseline model confirmed the existence of class differences, adjusting for maths performance accounted for all between class differences. This would support the understanding that class differences in conduct do not reflect subcultural aversion to education that is being expressed in poor conduct, but rather that factors correlated with class, such as academic performance, account for the association.

However, our model was not able to account for differences by sex, with differences actually increasing as the model was developed. This could indicate that our model more readily explains the emergence of conduct difficulties for girls than for boys, potentially reflecting gendered differences in how maths performance and self-esteem are associated with conduct. It is possible, for instance, that these inequalities could reflect differences in gendered socialisation patterns, with girls being socialised into placing more importance on their academic performance than boys. This may then lead to girls' self-esteem being more closely intertwined with academic performance and motivation than for boys (Polavieja & Platt, 2014).

A potential explanation for the inability of our model to successfully predict conduct difficulties is the way we specified the self-esteem model, which failed to account for potential differences in how students evaluate poor performance. Dweck (2002) distinguished between students holding perceptions of ability as taking either an entity (innate and incapable of change from increased effort) or incremental (capable of improvement from increased effort) form. Students who felt they could improve their performance with increased effort (incremental perspective) may be less likely to have

poor self-esteem or externalise their disaffection through poor conduct. While psychological research, often availing of primary data, has more readily distinguished between student conceptualisations of ability as being innate or incremental (e.g. Dweck, 2002; Pomerantz & Saxon, 2001), information on such distinctions is often lacking from the secondary data utilised in sociological research. Unfortunately, the Growing Up in Ireland dataset does not contain any measure for whether students perceive ability as innate or incremental, thereby not allowing us to adjust for such perceptions. However, our results suggest that if true, this variation in beliefs is not correlated with social class differences as we would expect from previous literature, with there being no statistically significant interaction between maths performance and class.

Our theoretical model's inability to provide an effective explanation for variation in conduct leaves open the question as to what other factors could explain such differences. One potential explanation could be that factors correlated with household class, such as poverty, strain and resources, are also driving differences in student disaffection in school. An alternative explanation could be that SEG differences in student disaffection reflect school-level differences, with schools that lower-SEG students attend being less-engaging and academically fulfilling than the schools attended by higher-SEG students, thereby leading to greater levels of disaffection among lower-SEG students. While such explanations were not in the remit of this study to test, exploring such mechanisms could provide a clearer insight into the development of student disaffection.

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Study II: A fixed effects analysis of the effect of financial strain and parental depression on child behavioural difficulties during the Great Recession in Ireland

Abstract

Research has long identified class differences in the development of child behavioural difficulties; however, adjudicating between competing sub-cultural and resource-based explanations has been problematic because of the difficulty in separating causal mechanisms from pre-existing risk factors. This paper uses hybrid models to disentangle the effects of financial strain from existing class differences in determining child behavioural difficulties, using longitudinal data from Cohort98 of the Growing Up in Ireland study (N = 6,039; 51.2% female; ages 9-17) compiled before, during and after the Great Recession in Ireland. Analysis indicates that class differences in child behavioural difficulties are largely accounted for after adjusting for financial strain and parental depression. The discussion considers the implications of the findings and avenues for future research.

A fixed effects analysis of the effect of financial strain and parental depression on child behavioural difficulties during the Great Recession in Ireland

Research has long recognised the existence of social class differentials in child psychological adjustment (Bradley & Corwyn, 2002; Elder, 1974), with working-class children more likely to exhibit worse adjustment compared with their more socio-economically advantaged peers.

Different explanations for this socio-economic variation have been offered within the sociological literature, where there is a long-standing interest in the role of social class differences in parenting, family values, and social expectations. One thread argues that class patterns in child psychology reflect the values and parenting styles of different classes forged through their experience in the workplace (Kohn, 1977), and the disconnect between this and broader societal processes and values (Connell et al., 1995; Willis, 1993).

A second sociological literature argues that observed socio-economic variation in child behavioural difficulties actually reflects the contrasting experiences of financial strain and its effect on family processes (Conger et al., 1994, 2002). However, adjudicating between these two explanations has proven problematic because most studies are based on cross-sectional data where it is difficult to separate the causal effect of socio-economic pressure from pre-existing risk factors such as class culture. What is required is variation in the experience of socio-economic strain over time within families, thus enabling class and financial strain effects to be disentangled.

The Great Recession in the Republic of Ireland (hereafter Ireland) provided such a major, society-wide economic contraction, with the unemployment rate increasing from 4% in 2007 to 15% in 2011, coupled with decreasing incomes and increased prevalence of

relative financial strain across socio-economic classes (Eurostat, 2021; Layte & McCrory, 2018; Reinhard et al., 2018). The severity and suddenness of the economic contraction provide researchers with a unique opportunity to answer the question of why working-class students tend to have worse psychological adjustment than their more advantaged peers. This paper uses data from Cohort98 of the Growing Up in Ireland Child Cohort study, which provides longitudinal data on children and their families before (Wave 1: 2007-8), during (Wave 2: 2011-12), and after (Wave 3: 2015-16) the Great Recession in Ireland, to explore the mechanisms behind the class patterns in behavioural difficulties.

Sub-cultural explanations

Previous research has repeatedly observed that children and young people from lower socio-economic groups (hereafter SEG) are more likely to exhibit challenging personal behaviours and emotional problems than their higher-SEG peers (Flouri et al., 2015; Schonberg & Shaw, 2007). For instance, lower-SEG children are more likely to engage in risk-taking and delinquent behaviour (Tittle & Meier, 1990), to become disaffected with school (Furlong, 1991; Skinner et al., 2008), and to develop behavioural difficulties (Kaiser et al., 2017; Mazza et al., 2017).

In the sociological literature, this widespread pattern has often been attributed to differences in how working and professional class children are socialised by parents, family and communities, and the different values these social environments instil in children. Willis' (1993) classic ethnographic study of working-class boys in England, for instance, theorised that problematic behaviour among boys reflected a sub-cultural rejection of middle-class educational values which were perceived as alien to the values held by their families and communities. For the working-class boys that were the subject of Willis' research, rejecting education was part of a 'lad' culture encouraged by the

families and communities the children came from, one that placed greater merit in working-class manual and unskilled labour, over the white-collar, middle-class occupations that valued education.

A key dimension of such sub-cultural explanations has been the role parenting plays both in child value socialisation and the disciplinary practices adopted to deal with such behaviour. Kohn (1963, 1977), for instance, offered the explanation that parenting styles emerged in response to the occupations the parents hold and their experience of authority and control in the workplace. For lower-SEG parents who are more likely to work in environments with less control and autonomy, parenting places emphasis on child obedience to parental wishes. In contrast, higher-SEG parents are more likely to value independence and judgement in their children and so are less likely to adopt didactic forms of parenting, employing parenting styles that develop communication skills, self-direction and autonomy instead. Lareau (2000, 2003) distinguishes between engaged, ‘concerted cultivation’ parenting styles, predominantly adopted by higher-SEG parents, and the ‘natural growth’ approaches that lower-SEG parents were more likely to adopt. While concerted cultivation imbues children with both the skills and confidence to actively engage and communicate with adult figures such as schoolteachers and coaches, a more natural growth approach leaves working-class children less equipped to engage effectively with adults and school bodies, leading to both underperformance and frustration. Chan and Koo (2011), building on the different parenting typologies developed by Baumrind (1991), similarly identified class dynamics in the adoption of the various parenting styles, with lax ‘permissive’ forms of parenting more prevalent among lower-SEG families, while higher-SEG parents were more likely to adopt engaged, ‘authoritative’ parenting styles. The didactic, lax, and inconsistent forms of parenting, more commonly adopted by lower-SEG families, are more likely to be associated with problematic child behaviours and

disciplinary difficulties (Deater-Deckard & Dodge, 1997; Kiernan & Huerta, 2008) and worse child outcomes in later life (Simons et al., 1994).

Resource-based explanations

Sub-cultural explanations that stipulate the development of parenting style as the product of class values and outlooks risk overlooking the role played by other factors – such as poverty, deprivation, and education – that could provide an alternative explanation for class differences in the development of child psychological adjustment. Working-class families are more likely to experience a lack of resources, to live in high-risk and high-crime neighbourhoods, and to suffer income poverty, all of which may have an influence on parenting practices (Conger & Conger, 2002; Leventhal & Brooks-Gunn, 2004).

Similarly, poverty has long been associated with harsher and more inconsistent parenting (Flouri et al., 2015; Kiernan & Huerta, 2008), and there is evidence of an inverse association between parenting quality and financial stress (Reiss, 2013).

A theoretical mechanism explaining the relationship between financial strain and child psychological adjustment was put forward by Conger and colleagues, in the form of the Family Stress Model (Conger et al., 1992; Conger & Conger, 2002). Initially conceptualised to explain the effect of the economic recession in rural Iowa on family processes (Conger et al., 1992, 1994; Conger & Conger, 2002), the Family Stress Model (FSM) proposes that difficulties in making ends meet and economic strain indirectly affect a child's conduct in school via the effects of psychological distress on parenting behaviours. Here, parental experience of financial hardship increases their risk of emotional distress and the likelihood of depression (Berkowitz, 1989; Conger et al., 2002). This emotional distress can have a negative impact on the relationship between marital partners in the household through increased conflict and the withdrawal of supportive

behaviours, with the conflict between partners and poor parental mental health potentially resulting in the adoption of harsher and inconsistent parenting styles and less effective involvement in the child's discipline and monitoring. These types of parenting behaviours can lead to child internalising (e.g. anxiety and depression) and externalising (e.g. poor conduct and hyperactivity) conditions with implications for later child outcomes.

The Great Recession in Ireland

Most of the seminal studies exploring the effect of changing economic circumstances on family processes and child behaviour have been produced following periods of economic recession. Elder's (1974) pioneering life course study, *Children of the Great Depression*, shed light on the long-lasting psychological and social effects of the Great Depression on families and their children, many years after the economic impact of the Depression itself had subsided. Similar long-term effects of financial strain have been identified by researchers following other periods of recession, such as the Farm Belt Depression of the 1980s (Conger et al., 1994; Elder & Conger, 2000), Finland in the early 1990s (Solantaus et al., 2004), or the effects of the Great Recession of 2009-11 (Layte & McCrory, 2018; Leininger & Kalil, 2014).

This paper examines the effect of financial strain on family processes in Ireland using data from before (2007), during (2011), and after (2015) the Great Recession. The wide-ranging and significant effect of the Great Recession on Irish society provides us with a unique opportunity to study the effect of meaningful variation in financial strain within families, allowing us to examine how changes in financial strain is associated with parent child-dynamics and how strain-induced changes affect the development of child internalising and externalising symptoms. The adoption of multilevel modelling approaches further

allows us to examine whether class differences in child psychological adjustment are a function of differential exposure to economic strain.

Hypotheses

We have outlined two competing theories which offer an explanation of socio-economic differences in child psychological adjustment. While subcultural explanations accentuate the role of class values, norms, and aspirations in explaining SEG differences, resource-based theories such as the Family Stress Model hypothesise that these differences emerge as a direct result of socio-economic confounders, such as financial strain. Our first hypothesis therefore addresses whether financial strain predicts the development of internalising and externalising conditions:

H1: *Increased financial strain is positively associated with the prevalence of internalising and externalising symptoms.*

The Family Stress Model stipulates the effect of financial strain on child-behavioural outcomes is mediated through its effect on parent mental health, the decline of which damages parent-child and inter-parent relationships. As such, we anticipate that a substantial proportion of the initial effect of financial strain will be accounted for by change in parent mental health.

H2: *Increasing parental depression will mediate the total effect of financial strain on child internalising and externalising conditions.*

Lastly, should both hypotheses 1 and 2 be correct, we further anticipate that these differences in financial strain and maternal depression will account for class differences in child internalising and externalising conditions. This would be in contrast with a sub-cultural explanation, where differentials in child behavioural symptoms are posited to reflect class-informed values and goals, and therefore be independent of factors such as

financial strain and maternal depression. We hypothesise that adjusting for financial strain and maternal depression will account for class differentials, in contrast to a sub-cultural expectation that differences in child behavioural symptoms will remain stable:

H3: *Adjusting for financial strain and parental depression, class differences in child behavioural conditions will be fully accounted for.*

Method

Sample

This paper makes use of the first three waves of Cohort98 of the Growing Up in Ireland Child Cohort study, a nationally representative longitudinal study of children, their parents, and their schools in the Republic of Ireland. The first three waves of data coincide with the period immediately prior to, during, and after the Great Recession in Ireland. Wave 1 interviews took place between the end of 2007 and the start of 2008, a period directly before the economic downturn, when study children were nine years old. Wave 2 interviews took place from late 2011 to early 2012, during the height of the Great Recession in Ireland, with study children aged 13. Wave 3 (2015-16) coincided with a recovering economic climate, when study children were between 17 and 18 years old. A sample of 8,568 nine year olds and their families, or approximately one in every seven nine-years-old children registered in the 2006 census, were included in Wave 1, of which 7,525 remained in Wave 2 (88%) and 6,216 in Wave 3 (73%). 6,039 of which were present in all three waves, constituting the size of our analytical sample.

Study children were sampled using a two-stage process, with schools sampled in stage one and students sampled within schools in stage two. To ensure adequate representation of key school variables, schools were systematically stratified by disadvantaged status,

denomination, size, sex-mix, and geographic location. In the second stage of sample selection, up to 40 students were randomly selected in each school.

Both parents or guardians (where relevant) of the study child were interviewed at home, while the study child's teachers (Wave 1 only) and school principal were interviewed in schools. Parent(s) or guardian(s) were self-defined as either primary (PCG) or secondary (SCG) caregivers, with mothers being self-defined as PCG in almost all instances.

Dependent variable

Behavioural symptoms Our outcome variables were internalising and externalising symptoms in children. We constructed these two measures from the subscales of the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997), by summing responses to the *Emotional symptoms* and *Peer relationship problems* subscales as a measure of internalised behavioural difficulties, and summing responses to the *Conduct problems* and *Hyperactivity/Inattention* subscales to measure externalised behavioural difficulties. These measures were reported by the study child's primary caregiver (PCG), which in nearly all instances (99%) was the study child's mother. Both scales were reverse coded, so that 0 indicated no behavioural symptoms and 20 indicated the greatest possible behavioural symptoms.

Independent variables

Strain Financial strain was measured using PCG responses to the question, '*With which degree of ease or difficulty is the household able to make ends meet?*', with responses given on a six-point scale where 1 = with great difficulty, and 6 = with no difficulty. The scale was reverse coded, so that higher values indicated increased financial strain.

Maternal depression Parental depression was measured through PCG responses to the 8-item short version of the Centre for Epidemiological Studies Depression Scale (CES-D), a

self-reported measure developed as a screening instrument for depression in the general population (Radloff, 1977). As in almost all cases the PCG is the study child's mother, the measure is reported as maternal depression.

Household class A measure for social class was developed using the details provided by the primary and secondary caregivers (where appropriate) on their present occupation in Wave 1 or, where PCG or SCG were economically inactive, prior occupation. Household class was derived using a dominance criterion, where the highest social-class category of either parent in the household (as appropriate) was taken as the overall household class. Originally categorised into seven different categories, the three smallest categories – *Semi-skilled*, *Unskilled* and *All others gainfully occupied and unknown* – had a combined size smaller than the next smallest category and were therefore collapsed together. The resulting five class categories used in the analysis consisted of *Higher Managerial and Professional*, *Lower Managerial and Professional*, *Administrative*, *Skilled Manual* and *Semi and Unskilled*.

Sex The biological sex of the study child was measured using a dichotomous male or female variable.

Control variables Models controlled for household type (single or two parent, number of siblings), whether the study child has a long-standing illness or condition, whether the study child has learning difficulties and the employment status of the PCG (employed, unemployed, in education, home duties).

Treatment of missing values

Non-response to independent variables was generally low, reaching a maximum of 6.5% missing for Maternal Depression in Wave 1. Despite this, the effect of missing data on analysis can affect both the precision of estimation and statistical power (Sterne et al., 2009). As such, all missing dependent and independent variables were imputed (20

iterations) using multiple imputation by chained equations (MICE) in Stata 15. The imputation model included all model variables used in the analyses, as well as parental education. As a sensitivity check, results obtained using multiple imputation estimation were compared with complete case analysis, with no major differences observed.

Weights

In order to account for inter-wave attrition and to maintain a sample that reflected population characteristics, data was reweighted using weights developed by the Growing Up in Ireland Study team. The weights use a minimum information algorithm to fit population marginals in a regression framework to adjust the sample estimates so that they match the population parameters using sixteen dimensions drawn from national census data.

Analysis plan

The adoption of a random effects model would allow us to estimate both within and between-household effects. This is illustrated in the equation (1) below

$$y_{it} = \beta_0 + \beta_1 x_{it} + \beta_2 z_i + \alpha_i + \varepsilon_{it} \quad (1)$$

where subscript i denotes level 2 (time-constant) and t denotes level 1 (time-variant), x_{it} is a vector of variables that varies between- and within-households, z_i is a vector of time-constant variables, β_0 is the random intercept that may differ in each time period, α_i is the unobserved time-invariant heterogeneity and ε_{it} is the unexplained level 1 variance (idiosyncratic error) (Allison, 2009). However, accurate estimation using random effects rests on the assumption that unobserved time-invariant heterogeneity α is uncorrelated with the regressors. Where this assumption is violated, endogeneity will lead to the inaccurate estimation of level 1 coefficients (Antonakis et al., 2021). Fixed effects models hold an advantage over random effects models when analysing longitudinal data, in that

they are able to control for all level 2 characteristics (between-household effects) that can bias the true effect of level 1 time-variant characteristics (within-household effects), thereby removing all unobserved time-invariant heterogeneity (Allison, 2009; Schunck, 2013). This is done by subtracting the between model from the random effects model (1), leaving a fixed effects model (2) without the random intercept, allowing the unbiased estimation of level 1 coefficients.

$$(y_{it} - \bar{y}_i) = \beta_1(x_{it} - \bar{x}_i) + (\varepsilon_{it} - \bar{\varepsilon}_i) \quad (2)$$

However, by controlling for all time-invariant characteristics, a fixed effects model has the drawback that time-invariant characteristics cannot be included. Hybrid models (also known as the between-within method) (3) (Allison, 2009) allow us to circumvent this limitation while also accurately estimating both within- and between-effects in a random effects model through the inclusion of cluster de-meaned level 1 variables (i.e. group mean centring) and level 1 variable cluster means that pick up any correlation between level 2 error and level 1 variables.

$$y_{it} = \beta_0 + \beta_1(x_{it} - \bar{x}_i) + \beta_2z_i + \beta_3\bar{x}_i + \alpha_i + \varepsilon_{it} \quad (3)$$

If x_i is correlated with α_i , the inclusion of the variable cluster mean $\bar{x}_i$ picks up the correlation, making x_i and μ independent of each other and providing identical level 1 variable coefficients as would be estimated using a fixed effects model (Wooldridge, 2019). The inclusion of cluster de-meaned level 1 variables also allows for the estimation of average between-cluster differences, enabling us to also estimate between-effects that is not possible in a fixed effects model (Allison, 2009). We therefore adopt a hybrid model to estimate both the within-family effects of economic strain and parental depression on child psychological adjustment (level 1 variables) and the level 2 (household class) between-family effects.

Following a sequential approach, the covariates for each model are displayed below:

Model 1 (Confounder-only model): Year + control variables + household class

Model 2 (Strain model): Model 1 + PCG Financial Strain

Model 3 (Strain + Depression model): Model 2 + PCG Depression

Model 1 provides a baseline, confounder-only model, adjusting for the effect of possible confounders on internalising and externalising symptoms and differences by household class. Financial strain is added in Model 2 in order to ascertain the total effect of financial strain on the behavioural symptoms exhibited by the study child, and the extent to which their inclusion explains class differences. Model 3 adds parental depression allowing us to determine the extent to which the total effect of financial strain on child behavioural symptoms is explained by parental depression.

Previous studies have identified differences in internalising and externalising conditions by sex, with girls more likely to internalise and boys more likely to externalise behavioural symptoms (Achenbach et al., 2002; Conger, 1994). A recent report using Cohort98 Growing Up in Ireland data has likewise found marked differences by sex in internalising and externalising symptoms (Smyth & Darmody, 2021). In order to better evaluate the mechanisms explaining internalising and externalising symptoms for both sexes, all models were run separately for boys and girls.

Results

Table 3. 1 provides descriptive summary statistics of the analytical sample used at each wave for time-varying variables. Values for time-invariant variables are provided for Wave 1 only. Our two dependent variables, internalising and externalising symptoms, decrease from Wave 1 to Wave 2, indicating improvement on average with age. However,

while externalising symptoms declined further in Wave 3, internalising symptoms increased to their highest level in Wave 3.

Our primary predictor, financial strain, increased strongly from Wave 1 to 2, reflecting the deteriorating economic situation in Ireland from 2007 to 2011. Financial strain declines somewhat in Wave 3 as the economy emerged from the Great Recession. The mean of our secondary predictor, parental depression, increases at each time point.

Table 3. 1: Summary statistics of analytical sample. Note: data unweighted and unimputed.

			Wave 1			Wave 2			Wave 3		
	Min	Max	N	Mean	SD	N	Mean	SD	N	Mean	SD
Internalised symptoms	0	20	6021	3.107	2.820	6038	2.823	2.796	5990	3.284	2.973
Externalised symptoms	0	20	6021	4.131	3.230	6038	3.553	3.169	5990	3.167	2.962
Financial strain	1	6	6035	2.774	1.056	6036	3.592	1.152	5987	3.364	1.205
Maternal depression	0	24	5645	1.969	3.157	5994	2.332	3.278	5893	2.650	3.507
Household type			6039			6039			5993		
Single Parent 1 or 2 children	0	1		0.067			0.082			0.118	
Single Parent 3 or more children	0	1		0.031			0.038			0.029	
Couple 1 or 2 children	0	1		0.377			0.456			0.584	
Couple 3 or more children	0	1		0.526			0.424			0.269	
Employment status, PCG			6034			6039			5992		
Working				0.593			0.638			0.695	
Education				0.012			0.013			0.012	
Unemployed				0.014			0.032			0.023	
Home duties/retired				0.381			0.317			0.269	
Chronic illness	0	1	6039	0.098		6037	0.098		5992	0.172	
Learning Difficulty	0	1	6036	0.083		6032	0.169		6037	0.057	
Household class			6039								
Higher Managerial and Professional	0	1		0.153							
Lower Managerial and Professional	0	1		0.410							
Administrative	0	1		0.188							
Skilled Manual	0	1		0.131							
Semi and Unskilled	0	1		0.118							
Female	0	1	6039	0.512							

Table 3. 2 shows the mean internalising and externalising symptom scores, the mean financial strain values and the mean primary caregiver depression scores by household class and child sex at each wave. While all classes follow the behaviour patterns outlined in Table 1, class differences are present for both internalising and externalising symptoms at each time point: the *Higher Managerial and Professional* class exhibit the least

difficulties, and there is a hierarchical increase in difficulties until the *Semi and Unskilled* class. Differences are also observed by child sex, with girls exhibiting higher average internalising symptoms and boys higher average externalising symptoms.

Table 3. 2: Mean values and standard deviations for internalising symptoms (0-20), externalising symptoms (0-20), financial strain (1-6) and maternal depression (0-24). Note: data weighted and imputed.

	Mean (SD) internalising symptoms			Mean (SD) externalising symptoms			Mean (SD) financial strain			Mean (SD) maternal depression		
	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
Household class												
<i>Higher Managerial and Professional</i>	2.58 (2.57)	2.32 (2.52)	2.82 (2.74)	3.68 (3.05)	3.08 (2.9)	2.83 (2.75)	2.37 (1.02)	3.15 (1.26)	2.96 (1.14)	1.59 (2.53)	2.01 (2.82)	2.26 (2.89)
<i>Lower Managerial and Professional</i>	2.97 (2.72)	2.61 (2.66)	3.04 (2.78)	4.02 (3.04)	3.44 (2.99)	3.13 (2.93)	2.67 (1)	3.44 (1.07)	3.26 (1.16)	1.83 (3.02)	2.02 (2.84)	2.42 (3.26)
<i>Administrative</i>	3.4 (2.9)	3.02 (2.81)	3.47 (2.98)	4.78 (3.57)	4.08 (3.43)	3.48 (3)	2.98 (1.03)	3.81 (1.08)	3.52 (1.18)	2.22 (3.5)	2.49 (3.56)	2.92 (3.74)
<i>Skilled Manual</i>	3.54 (3.09)	3.53 (3.22)	3.54 (2.93)	4.74 (3.44)	4.45 (3.49)	3.51 (3.13)	3.05 (1.02)	4.08 (1.04)	3.62 (1.1)	2.16 (3.6)	2.79 (3.78)	2.72 (3.71)
<i>Semi and Unskilled</i>	4.05 (3.25)	3.84 (3.24)	4.01 (3.29)	5.18 (3.53)	4.83 (3.94)	3.97 (3.44)	3.62 (1.11)	4.32 (1.11)	3.99 (1.23)	3.01 (4.19)	3.54 (4.67)	3.52 (4.52)
Child sex												
<i>Male</i>	3.23 (3)	2.94 (2.96)	2.92 (2.77)	4.89 (3.48)	4.34 (3.52)	3.72 (3.23)	2.93 (1.09)	3.71 (1.17)	3.5 (1.24)	2.12 (3.38)	2.54 (3.62)	2.86 (3.84)
<i>Female</i>	3.52 (2.99)	3.19 (2.93)	3.97 (3.16)	4.17 (3.28)	3.6 (3.27)	3.18 (2.98)	3 (1.12)	3.82 (1.17)	3.57 (1.21)	2.25 (3.56)	2.55 (3.61)	2.82 (3.72)

All household class groups exhibit an increase in strain on average from Wave 1 to Wave 2, reflecting the changing economic environment as the country moved from a period of economic prosperity to severe economic contraction. Average reported levels of financial strain decreased in Wave 3 relative to Wave 2 as the economic recovery took place, albeit still at a higher level than reported prior to the recession. Class hierarchical differences remained at all time points, with lower socio-economic classes consistently reporting higher financial strain. Maternal depression increases with time for all class groups except for *Skilled Manual* and *Semi and Unskilled*, who report slightly lower depression scores at

Wave 3 relative to Wave 2. However, maternal depression similarly follows a similar hierarchical pattern to behavioural symptoms and strain, with *Higher Managerial and Professional* reporting the lowest depression scores at each time point, while *Semi and unskilled* conversely reported the highest depression scores at each wave.

Hybrid models

Tables 3. 3 and 3. 4 provide results for hybrid models of internalising (Table 3. 3) and externalising (Table 3. 4) symptoms by sex.

Internalising Symptoms

Table 3. 3, Model 1 indicates different trajectories for internalising symptoms by sex, with both sexes having improved internalising symptoms at age 13 (Wave 2) relative to age 9 (Wave 1, baseline), but girls having a statistically significant increase in internalising symptoms at age 17 (Wave 3). By contrast, age is associated with lower internalising symptoms among boys at age 17. Differences by household class are also in evidence, with both boys and girls from *Skilled Manual* and *Semi and Unskilled* classes and girls from *Administrative* class having higher internalising symptoms relative to the *Higher Managerial and Professional* baseline.

Model 2 includes financial strain as a predictor of internalising symptoms. Within-household change in financial strain has a similarly sized and statistically significant effect on internalising symptoms for both boys and girls, while higher between-household (averaged) differences in strain are also associated with higher internalising symptoms for both boys (0.392, $p < 0.001$) and girls (0.491, $p < 0.001$). Furthermore, the inclusion of between-household strain appears to account for the class effect, with household class no longer associated with behavioural symptoms of either boys or girls.

Maternal depression is added in Model 3. Both within- and between-household depression is associated with internalising symptoms for boys and girls, accounting for some of the effect of financial strain, albeit the association of financial strain with internalising symptoms remains. Curiously, the inclusion of between-household maternal depression restores part of the class effect for girls, with girls in *Administrative* class households exhibiting greater internalising symptoms relative to *Higher Managerial and Professional* class girls, adjusted for financial strain and maternal depression.

Externalised Symptoms

Table 3. 4, Model 1 shows that externalising symptoms decrease with age for both sexes. As with internalising symptoms, young people in manual social classes are more likely to have higher externalising symptoms relative to the *Higher Managerial and Professional* baseline. Adjusting for financial strain in Model 2 accounts for class differences among girls, with between-household (averaged) differences in strain strongly associated with externalising symptoms for both boys and girls, while a one unit increase in within-household strain is associated with a 0.134 and 0.108 increase in externalising symptoms in boys and girls respectively ($p < 0.001$). However, while the size of class differences in symptoms in boys is reduced after adjusting for financial strain, some class differences remain with boys in manual households exhibiting more externalising symptoms relative to those in *Higher managerial and Professional* households.

Adding maternal depression to Model 3 has little effect on class differences for either boys or girls, with the exception that girls from *Administrative* class backgrounds exhibit more externalising symptoms relative to the baseline after adjustment for average maternal depression. Between-household differences in maternal depression are statistically significant predictors of externalising symptoms, as are within-household changes in

maternal depression, with a one unit increase in maternal depression associated with a 0.076 and 0.107 increase in externalising symptoms for boys and girls respectively ($p < 0.001$). The inclusion of maternal depression also accounts for some of the within- and between-household financial strain effect on externalising symptoms.

Table 3. 3: Internalising symptoms. Note: data weighted and imputed.

	Boys						Girls					
	I		II		III		I		II		III	
Time (Baseline: Wave 1)												
Wave 2	-0.350***	(0.052)	-0.428***	(0.057)	-0.428***	(0.057)	-0.410***	(0.058)	-0.494***	(0.065)	-0.485***	(0.065)
Wave 3	-0.342***	(0.056)	-0.397***	(0.058)	-0.410***	(0.059)	0.386***	(0.063)	0.325***	(0.066)	0.318***	(0.067)
Financial strain			0.100**	(0.030)	0.086**	(0.031)			0.102**	(0.035)	0.080*	(0.035)
Maternal depression					0.036**	(0.011)					0.065***	(0.010)
Chronic illness	0.235**	(0.083)	0.220**	(0.083)	0.199*	(0.083)	0.385***	(0.095)	0.384***	(0.094)	0.357***	(0.094)
Learning difficulties	0.344***	(0.102)	0.338***	(0.102)	0.345***	(0.101)	0.725***	(0.126)	0.717***	(0.126)	0.719***	(0.125)
PCG Employment (Baseline: employed)												
In education	0.132	(0.185)	0.093	(0.185)	0.118	(0.185)	-0.039	(0.202)	-0.083	(0.202)	-0.068	(0.202)
Unemployed	0.290	(0.149)	0.270	(0.149)	0.268	(0.148)	0.209	(0.177)	0.177	(0.177)	0.188	(0.176)
Home duties/retired/other	0.082	(0.086)	0.067	(0.086)	0.057	(0.086)	-0.228**	(0.088)	-0.242**	(0.088)	-0.248**	(0.088)
Household type (Baseline: Single parent, one or two children)												
Single parent, three or more children	-0.067	(0.183)	-0.043	(0.183)	-0.033	(0.182)	-0.609***	(0.183)	-0.634***	(0.183)	-0.659***	(0.183)
Two parents, one or two children	0.566***	(0.139)	0.608***	(0.140)	0.646***	(0.140)	-0.518***	(0.156)	-0.494**	(0.156)	-0.488**	(0.155)
Two parents, three or more children	0.249	(0.148)	0.297*	(0.149)	0.335*	(0.149)	-0.415*	(0.167)	-0.391*	(0.167)	-0.370*	(0.166)
Strain, mean			0.392***	(0.047)	0.236***	(0.047)			0.491***	(0.049)	0.342***	(0.049)
Maternal depression, mean					0.203***	(0.017)					0.229***	(0.017)
Chronic illness, mean	1.899***	(0.185)	1.749***	(0.184)	1.394***	(0.180)	1.930***	(0.205)	1.722***	(0.203)	1.368***	(0.199)
Learning difficulties, mean	2.368***	(0.165)	2.355***	(0.163)	2.244***	(0.158)	2.100***	(0.199)	1.967***	(0.196)	1.798***	(0.191)
PCG Employment (Baseline: mean employed)												
Mean In education	0.776	(0.583)	0.614	(0.575)	0.711	(0.556)	1.019	(0.555)	0.553	(0.547)	0.433	(0.530)
Mean Unemployed	0.716	(0.415)	0.265	(0.413)	0.202	(0.400)	1.185*	(0.466)	0.633	(0.462)	0.421	(0.449)
Mean Home duties/retired/other	0.426***	(0.111)	0.370***	(0.110)	0.253*	(0.107)	0.405***	(0.120)	0.320**	(0.118)	0.247*	(0.115)
Household type (Baseline: mean Single parent, one or two children)												
Mean Single parent, three or more children	0.209	(0.329)	0.134	(0.324)	0.182	(0.315)	-0.090	(0.321)	-0.284	(0.316)	-0.292	(0.306)
Mean Two parents, one or two children	-0.780***	(0.171)	-0.549**	(0.171)	-0.320	(0.167)	-0.602***	(0.176)	-0.333	(0.175)	-0.079	(0.171)
Mean Two parents, three or more children	-1.040***	(0.174)	-0.901***	(0.173)	-0.574***	(0.170)	-0.917***	(0.179)	-0.745***	(0.177)	-0.453**	(0.173)
Class (baseline: Higher managerial and professional)												
Lower Managerial and Professional	0.134	(0.124)	0.026	(0.124)	0.021	(0.121)	0.198	(0.145)	0.060	(0.143)	0.106	(0.140)
Administrative	0.199	(0.141)	-0.013	(0.142)	-0.010	(0.138)	0.510**	(0.162)	0.280	(0.161)	0.367*	(0.157)
Skilled Manual	0.330*	(0.154)	0.091	(0.155)	0.137	(0.150)	0.350*	(0.170)	0.029	(0.170)	0.075	(0.166)
Semi and Unskilled	0.515**	(0.168)	0.246	(0.169)	0.279	(0.165)	0.428*	(0.179)	0.062	(0.180)	0.098	(0.175)
Constant	2.949***	(0.195)	1.755***	(0.243)	1.629***	(0.236)	3.163***	(0.210)	1.685***	(0.258)	1.436***	(0.252)
Sqrt. Variance: Level 2	0.519***	(0.019)	0.501***	(0.020)	0.458***	(0.020)	0.575***	(0.020)	0.552***	(0.020)	0.507***	(0.021)
Sqrt. Variance: Level 1	0.680***	(0.009)	0.679***	(0.009)	0.676***	(0.009)	0.766***	(0.009)	0.765***	(0.009)	0.759***	(0.009)
Observations	2,947		2,947		2,947		3,092		3,092		3,092	

Standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05

Table 3. 4: Externalising symptoms. Note: data weighted and imputed.

	Boys						Girls					
	I		II		III		I		II		III	
Time (Baseline: Wave 1)												
Wave 2	-0.654***	(0.055)	-0.758***	(0.060)	-0.758***	(0.060)	-0.603***	(0.054)	-0.692***	(0.060)	-0.687***	(0.060)
Wave 3	-1.171***	(0.058)	-1.245***	(0.061)	-1.275***	(0.061)	-0.952***	(0.059)	-1.016***	(0.061)	-1.019***	(0.062)
Financial strain			0.134***	(0.032)	0.107***	(0.032)			0.108***	(0.033)	0.095**	(0.033)
Maternal depression					0.076***	(0.011)					0.037***	(0.010)
Chronic illness	0.345***	(0.087)	0.324***	(0.087)	0.284**	(0.087)	-0.027	(0.088)	-0.027	(0.088)	-0.042	(0.088)
Learning difficulties	0.681***	(0.105)	0.673***	(0.105)	0.683***	(0.105)	0.463***	(0.121)	0.455***	(0.120)	0.457***	(0.120)
PCG Employment (Baseline: employed)												
In education	-0.909***	(0.193)	-0.961***	(0.193)	-0.904***	(0.192)	0.412*	(0.193)	0.366	(0.194)	0.374	(0.194)
Unemployed	0.277	(0.157)	0.250	(0.157)	0.242	(0.156)	-0.181	(0.164)	-0.215	(0.165)	-0.207	(0.164)
Home duties/retired/other	-0.042	(0.089)	-0.061	(0.089)	-0.076	(0.088)	0.070	(0.083)	0.055	(0.083)	0.050	(0.083)
Household type (Baseline: Single parent, one or two children)												
Single parent, three or more children	0.365	(0.191)	0.397*	(0.191)	0.425*	(0.189)	0.357*	(0.170)	0.329	(0.170)	0.312	(0.170)
Two parents, one or two children	0.105	(0.146)	0.161	(0.146)	0.233	(0.145)	-0.144	(0.145)	-0.119	(0.145)	-0.117	(0.145)
Two parents, three or more children	0.064	(0.156)	0.127	(0.156)	0.197	(0.156)	-0.211	(0.156)	-0.186	(0.156)	-0.176	(0.156)
Strain, mean			0.333***	(0.058)	0.214***	(0.059)			0.395***	(0.052)	0.272***	(0.052)
Maternal depression, mean					0.158***	(0.021)					0.191***	(0.019)
Chronic illness, mean	1.099***	(0.231)	0.969***	(0.231)	0.691**	(0.230)	0.861***	(0.214)	0.692**	(0.213)	0.398	(0.211)
Learning difficulties, mean	3.767***	(0.203)	3.754***	(0.202)	3.668***	(0.200)	3.471***	(0.209)	3.363***	(0.208)	3.224***	(0.205)
PCG Employment (Baseline: mean employed)												
Mean In education	-1.157	(0.730)	-1.297	(0.726)	-1.231	(0.717)	1.301*	(0.589)	0.926	(0.585)	0.808	(0.573)
Mean Unemployed	-0.206	(0.516)	-0.583	(0.517)	-0.642	(0.511)	1.503**	(0.488)	1.057*	(0.487)	0.871	(0.478)
Mean Home duties/retired/other	0.026	(0.136)	-0.018	(0.136)	-0.108	(0.135)	0.137	(0.125)	0.072	(0.124)	0.011	(0.122)
Household type (Baseline: mean Single parent, one or two children)												
Mean Single parent, three or more children	-0.217	(0.411)	-0.283	(0.409)	-0.255	(0.404)	0.370	(0.340)	0.214	(0.337)	0.211	(0.330)
Mean Two parents, one or two children	-1.191***	(0.211)	-0.993***	(0.213)	-0.816***	(0.212)	-0.739***	(0.185)	-0.523**	(0.186)	-0.307	(0.183)
Mean Two parents, three or more children	-0.998***	(0.215)	-0.876***	(0.215)	-0.624**	(0.215)	-0.864***	(0.188)	-0.725***	(0.187)	-0.478**	(0.185)
Class (baseline: Higher managerial and professional)												
Lower Managerial and Professional	0.073	(0.150)	-0.019	(0.150)	-0.022	(0.148)	0.129	(0.148)	0.019	(0.148)	0.057	(0.145)
Administrative	0.519**	(0.170)	0.338*	(0.172)	0.341*	(0.170)	0.466**	(0.167)	0.281	(0.167)	0.354*	(0.164)
Skilled Manual	0.647***	(0.188)	0.443*	(0.190)	0.479*	(0.188)	0.429*	(0.176)	0.170	(0.177)	0.207	(0.174)
Semi and Unskilled	0.662**	(0.206)	0.432*	(0.209)	0.459*	(0.207)	0.344	(0.186)	0.049	(0.188)	0.078	(0.185)
Constant	4.709***	(0.238)	3.713***	(0.299)	3.619***	(0.296)	3.795***	(0.218)	2.619***	(0.269)	2.404***	(0.266)
Sqrt. Variance: Level 2	0.793***	(0.018)	0.786***	(0.018)	0.772***	(0.018)	0.678***	(0.018)	0.665***	(0.018)	0.638***	(0.018)
Sqrt. Variance: Level 1	0.725***	(0.009)	0.723***	(0.009)	0.718***	(0.009)	0.695***	(0.009)	0.694***	(0.009)	0.691***	(0.009)
Observations	2,947		2,947		2,947		3,092		3,092		3,092	

Standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05

Discussion

Socio-economic variation in child and adolescent psychological adjustment has long been identified in academic research and two main sociological explanations have been put forward to explain this. The class sub-cultures approach argues that class differences reflect differences in parenting styles, values, and aspirations that parents develop as a consequence of their experiences in the workplace. Conversely, resource-based theories such as the Family Stress Model focus on the role of financial strain in shaping family processes which in turn can influence the development of child and adolescent behavioural difficulties.

We tested these competing explanations by evaluating the degree to which class differences remained (as might be expected in a sub-cultural explanation) after adjusting for between-household financial strain and maternal depression. Furthermore, Cohort98 of the Growing Up in Ireland dataset provided us with a unique longitudinal dataset, collected during a period of severe economic fluctuation, through which we could also directly test whether changes in financial strain within-households influenced the development of child and adolescent behavioural symptoms via its impact on maternal mental health.

Our results largely support a resource-based explanation, with class differences in child behavioural difficulties becoming statistically insignificant for boys' and girls' internalising symptoms and girls' externalising difficulties, once financial strain is adjusted for. Furthermore, between-household financial strain and maternal depression are strong, positive predictors of increased behavioural symptoms in both boys and girls net of household class, while within-household change in financial strain and maternal depression predict increased internalising and externalising symptoms for both boys and girls.

Sub-cultural explanations – namely that socio-economic variation in child behavioural symptoms reflected differences in class-instilled values – could not be directly tested owing to the absence of appropriate measures of values. However, we were able to indirectly test such explanations via examining the degree to which class differences remained after adjusting for financial strain and maternal depression. Given sub-cultural explanations posit that differences reflect values independent of financial strain, should such explanations be true, class effects should remain even after adjusting for financial strain. However, between-household differences in financial strain largely accounted for the original class effect. Furthermore, within-household change in financial strain and maternal depression were predictive of the development of both internalising and externalising behavioural symptoms in boys and girls. This would support an argument that differences in financial strain and maternal depression are what drive the underlying class differentials.

The inclusion of maternal depression in our models reduces the size of the effect of financial strain, while having limited effect on the remaining class effect, indicating that it primarily mediates the effect of financial strain on child behavioural difficulties. A curious outcome is that once maternal depression is adjusted for, statistically significant differences in internalising and externalising symptoms among girls from *Administrative* class households relative to the *Higher Managerial and Professional* baseline are restored. This is despite the fact that mean maternal depression is higher in *Administrative* class than in the baseline. This would appear to indicate that maternal depression does not fully mediate the class differences in *Administrative* households. A potential explanation for this could be that variables that were unaccounted for in our models, such as inter-parental conflict and parent-child relationship quality, mediate the relationship between financial strain and child behaviour for girls in *Administrative* classes, while maternal depression

does not. Unfortunately, our dataset does not contain measures of either inter-parental conflict or parent-child relationship quality in all waves to allow us to test whether this is the case.

Lastly, while class differences are accounted for in internalising symptoms for both boys and girls and externalising symptoms for girls, class effects, while reduced in size, remain for boys. This indicates that while financial strain and maternal depression do account for some of the class differences, some class differences remain unaccounted for. This could potentially be explained by other level 2 variables correlated with household class but independent of financial strain that we fail to adjust for in our analyses. For instance, it may also be that class differentials are shaped by factors independent of financial strain and family processes but correlated with class, such as peer bullying, which could mediate some of the relationship between class and behavioural symptoms. This has the implication that schools that predominantly draw their student intake from disadvantaged communities, which were more likely to experience financial strain, may experience more behavioural difficulties in children, net of family financial strain and maternal depression. Conversely, children whose families were experiencing financial strain and depression but who attended more socio-economically diverse schools could conceivably have developed fewer behavioural symptoms owing to the stabilising effect of the school environment. While this could not be tested in this study owing the absence of appropriate school-level measures and small sample sizes within schools, further research on whether school and neighbourhood effects moderate the effect of financial strain and maternal depression on child behavioural outcomes could provide greater insight into how ecological factors affect behavioural development.

Limitations

While the results of our study would appear to support out hypotheses that increased financial strain is predictive of increased behavioural symptoms in boys and girls (H1) and that maternal depression mediates this relationship (H2), our study holds limitations which need to be considered when interpreting the results. While our models sought to test many of mechanisms put forward by the Family Stress Model, variable quality and the absence of key variables precluded us from testing other possible pathways through which financial strain could affect child behavioural symptoms. For example, our analyses relied on screening instruments to measure maternal depression that may have inaccurately measured depression, while the absence of consistent measures of inter-parental and parent-child relationships did not allow us to test further pathways by which financial strain affected child behaviour. However, despite these limitations, the ability of the study to account for the majority of between class differences in child behavioural difficulties, coupled with the unique within-household longitudinal variability of Cohort98 data allowing us to identify causal effects of financial strain and maternal depression on child behavioural symptoms, provides further support for the positing of family resource informed explanations of the development of child behavioural symptoms.

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Study III: The effect of school type and ethos on student learning outcomes

Abstract

International research has long identified socio-economic differentials in educational performance and attainment, with students from lower socio-economic backgrounds, on average, performing worse than their higher socio-economic peers. Schools could conceivably moderate this effect, with attributes that differ between schools (such as resources, socio-economic composition, disciplinary practices and school ethos) having the potential to independently and/or collectively affect students' academic performance. However, identifying and measuring the effect of school-level attributes has been methodologically problematic, as students are usually not randomly allocated to schools, making it difficult to disentangle a school's effect from that of the students' socio-economic background. Using data from Cohort98 of the Growing Up in Ireland longitudinal study (N = 5336), in this paper we tackle this issue by adopting propensity stratification techniques that allow us to statistically disentangle the school effect from the attributes of the students who attend the schools, providing us with an accurate estimation of the effect that school attributes have in moderating student performance. Our analyses indicate that while school disciplinary practice do not have a statistically significant effect on student academic performance, both school type and school ethos hold substantial and statistically significant effects on student performance.

The effect of school type and ethos on student learning outcomes

Socio-economic differentials in educational outcomes remain despite increasing educational attainment across all social groups (Breen & Jonsson, 2005), giving rise to a substantial literature that has attempted to explain the mechanisms behind the development and the maintenance of differentials in educational attainment (Boudon, 1974; Gambetta, 1987; Jackson, 2013).

Sociological research has offered three main explanations for why these gaps exist and are maintained. Some studies approach the topic from a sub-cultural perspective, interpreting student disengagement with education as both the product of class-cultural norms and expectations (Ball, 1981; Connell et al., 1995; Willis, 1993), and the shortcomings between the low-brow cultural capital held by working-class children and the high-brow cultural expectations of the education system (Bourdieu & Passeron, 1977; DiMaggio, 1982). Other sociological approaches have focused on psycho-social processes within families and how these are influenced by the extent of economic strain experienced. Lower socio-economic position (SEP) households are more likely to experience financial stress, which in turn affects the quality of inter-parent and parent-child relationships, the repercussions of which are expressed by children in the form of worse psychological adjustment (Conger et al., 1992, 2002; Elder & Conger, 2000). These psychological difficulties have been shown to directly affect children's cognitive development (Kiernan & Huerta, 2008) and to hold long-term implications for children's educational development (Simons et al., 1994), appearing to explain at least part of the observed socio-economic inequalities in education (Layte, 2017, 2021).

There is also a well-developed literature on the role that schools play in shaping inequalities in educational outcomes across socio-economic groups. This research has

produced diverse results, with some studies finding that schools play an equalising role by reducing inequalities (Domina et al., 2017; Downey et al., 2004; Raudenbush & Eschmann, 2015), whilst others find that they foster inequalities (Sørensen & Hallinan, 1977; Stanovich, 1986), and still others observe that they play a largely neutral role which neither exacerbates nor narrows pre-existing social background inequalities (Passaretta & Skopek, 2021; von Hippel & Hamrock, 2019). Advocates of the position that schools serve as an equaliser argue that even allowing for unequal school quality, children largely attend the same ‘common school’ in practice, since variation between schools is smaller than the variation in the non-school environment children would otherwise be exposed to (Cremin, 1951; Downey et al., 2004).

Yet, while school-level differences may indeed be smaller than those between children from different socio-economic backgrounds, it could still be argued that school environment and characteristics play a role in generating educational differentials, with certain schools increasing or decreasing the inequalities created by social origin. Schools are themselves influenced by the societies, school organisations, teachers, neighbourhoods and students that shape them (Harker & Tymms, 2004). Furthermore, school characteristics can themselves foster the development of what Coleman (1971) termed an ‘adolescent society’, exposure to which is likely to affect students in a similar manner to social background characteristics.

A good example of how schools and the education system can shape inequalities in attainment is in school tracking. Tracked schools, by virtue of different curricula foci and pathways offered, inherently influence the academic options and outcomes of students. Indeed, tracking has been noted as one of the potential factors behind Germany’s high educational inequality relative to other industrialised countries, with only students who complete the academic track (Gymnasium) eligible for entry into tertiary education

(Jonsson et al., 1996; Neugebauer et al., 2013). Such systems risk accentuating what Boudon (1974) termed as the *primary* and *secondary* effects of social origin. As selection into academic or vocational tracks is heavily influenced by academic performance, the strong socio-economic association between academic performance and a student's socio-economic background (primary effects) affects the track in which a student is enrolled. School tracks further constrain the opportunities available to students by routing students into distinct academic or vocational tracks, affecting student choice and thereby the secondary effects (educational choices made net of primary effects) of social origin (Hanushek & Wößmann, 2006; Neugebauer et al., 2013). School tracking systems are also utilised in the Netherlands (Büchner & Velden, 2013) and Italy (Lievore & Triventi, 2021), with similar socio-economic differentials observed in selection into academic tracks.

In contrast to the tracking systems employed by Germany, the Netherlands and Italy, the Irish education system is largely standardised and undifferentiated in nature, with no consequential differentiation in curricular or academic foci between secondary schools (Smyth, 2016; Smyth & Banks, 2012). While entry into tertiary education is determined by a *numerus clausus* system whereby students are offered entry based on their performance in standardised *Leaving Certificate* matriculation exams at the end of secondary education, the Leaving Certificate curriculum and examinations are offered by all secondary level schools. This means that, in theory, all students who complete secondary level education and sit the Leaving Certificate examinations are eligible to proceed to tertiary education.

However, while all secondary schools offer the Leaving Certificate curriculum, certain schools catering for socio-economically disadvantaged communities obtain additional supports specifically aimed at increasing the performance and retention rate of their students. Schools partaking in the *Delivering Equality of Opportunity in Schools* scheme

(commonly and hereafter referred to by its acronym DEIS) receive additional resources, including targeted support to tackle literacy and numeracy problems, enhanced guidance counselling, and measures intended to improve attendance, progression, retention and attainment (Weir et al., 2018).

The additional resources afforded to DEIS schools does not however eradicate performance differentials between students in DEIS schools and their contemporaries in non-DEIS schools, with average student performance in DEIS schools substantially below the national mean (Smyth et al., 2015; Weir & Kavanagh, 2018). This is to be expected, given DEIS schools cater disproportionately for lower-SEP communities, with inequalities thereby reflecting the primary effects of the communities they serve. However, while direct comparison of mean performance in DEIS versus non-DEIS schools is not insightful in determining the effectiveness of the DEIS programme, neither can it fully assuage the fear of DEIS schools potentially compounding the effect of socio-economic disadvantage. Inequalities in performance might, for instance, be increased by the over-representation of disadvantaged students in DEIS schools. Quasi-experimental research has identified school composition effects, with lower-SEP students who attend schools catering for predominantly socio-economically advantaged students exhibiting study behaviour and performance closer to that of their classmates than shown by their lower-SEP peers in schools with high concentrations of lower-SEP students (Leventhal & Brooks-Gunn, 2004; Schwartz, 2011). This indicates that schools with a high concentration of students from more advantageous/disadvantageous socio-economic backgrounds create a positive/negative social-origin effects for students attending the schools, net of individual students' own social background. Similar findings have also been ascertained in observational studies in different country settings (Dumay & Dupriez, 2008; Opdenakker & Van Damme, 2001; Smyth, 1999).

If compositional effects exist, it could therefore be argued that students attending a DEIS school will perform worse compared to their performance in a counterfactual situation where they attended a non-DEIS school. Such a composition effect could reflect differences in peer-effects and norms between school types, with the higher performance of a lower-SEP child in a higher-SEP school potentially reflecting the high aspirations, strong academic standards and better academic performance set by their advantaged peers, motivating lower-SEP students in that school environment to attempt to match their peers' goals and academic standards (Saunders, 1995; Sokatch, 2006; Wilkinson, 2002; Wilkinson et al., 1999; Zimmer & Toma, 2000). This 'adolescent society' of students can, in turn, create a normative environment, conformity with which is respected and where deviance is rejected (Dumay & Dupriez, 2008). In a socio-economically advantaged environment where academic performance and ambition may be norms to be aspired to, students are encouraged to conform to these goals leading to greater academic performance net of students' own individual background characteristics. Conversely, in a school catering for a largely socio-economically disadvantaged student body where non-conformity to academic goals might be more common, conformity processes may induce students towards lower academic performance standards even after adjusting for their individual characteristics. In line with peer-effect explanations, we hypothesise that DEIS schools will negatively affect student performance net of students' individual social background characteristics:

H1: *Students attending DEIS schools will have a lower educational performance adjusting for individual characteristics.*

School ethos

Our first hypothesis argues that students who attend DEIS schools will have worse performance net of social background, owing to differing norms and conformity pressures set by the student body (peer effects). However, such a peer effect could also reflect school-level differences that correlate with school composition, such as the school ethos (e.g. learning environment as fostered by teacher-student relationship quality) and disciplinary practices (e.g. strictness and frequency of disciplinary actions), and how students engage with them. There is an established literature about how children from different socio-economic backgrounds engage with school. One of the most influential theories of social stratification in education, the cultural capital and reproduction argument of Bourdieu and Passeron (1977), hypothesises that children from professional class backgrounds hold an inherent advantage in school because the cultural capital they have been endowed with is appreciated in the education system. In contrast, children from lower socio-economic backgrounds are at a disadvantage in the education system because their cultural capital does not match the high-brow expectations of middle-class schools and teachers (DiMaggio, 1982).

The ability of cultural capital to determine child educational outcomes has been contested, both on account of the difficulty in conceptualising what Bourdieu meant by cultural capital in the first instance (Jæger & Breen, 2016; Lareau & Weininger, 2003; Sullivan, 2007), and by the fact that gaps in ability emerge even before children enter school (Fernald et al., 2013; Heckman, 2006; Layte, 2017; Passaretta et al., 2022), long before what Bourdieu calls “symbolic violence” (Bourdieu & Wacquant, 1992) in the education system can affect results. Yet, while differentials in cultural capital may fail to adequately explain the existence of SEP gaps in education performance, school attributes could conceivably still play a role in moderating student performance and outcomes, with school composition affecting the ‘culture’ adopted by the school.

A way of conceptualising this would be to adopt Willms and Raudenbush's (1989) framework to understand school-level differences, distinguishing between Type A school effects that reflect the expected average student performance in a school relative to the national mean, and Type B effects that account for the performance of the school compared to other schools with similar circumstances (e.g. student intake, contextual effects, etc). Within this framework, the anticipated lower average performance of a student in a DEIS school could be conceived as representing a Type A effect, as they disproportionately accept lower-SEP students who might be expected to perform worse academically relative to the national mean. Type B effects, in contrast, reflect how schools perform given their circumstances relative to other schools with the same characteristics, with within-school practices such as schools' ethos and disciplinary practices determining the difference (Cameron, 2006; Kim, 2005).

However, while Type A effects could reflect the characteristics of the school student body, they could also reflect other, unobserved differences in school characteristics that correlate with school intake. DEIS schools that disproportionately enrol lower-SEP students may, for instance, report greater behavioural difficulties among their student body, reflecting the average higher levels of externalising behavioural difficulties exhibited by lower-SEP children (Reiss, 2013). Such behavioural difficulties may prompt DEIS schools to more readily adopt school-level practices intended to deal with such disruption, such as a strict disciplinary climate, and didactic or less individually-tailored teaching approaches, the implementation of which creates a school environment that leads to worse academic performance (Smyth, 1999). While conclusions on the effect of teaching styles and disciplinary practices on student performance has been inconsistent, a body of research has indicated that constructivist teaching methods can be more beneficial for academic achievement than didactic approaches (Kim, 2005; Wilkinson et al., 1999). A previous

Irish study identified that non-DEIS primary schools were more likely to experience more active teaching methods than DEIS primary schools, with the authors suggesting that such differences in teaching methods might reflect engagement and conduct differences in student bodies (McCoy et al., 2012). If such a relationship between teaching style and DEIS schools carries through to secondary education, performance differentials attributed to differences in student intake might also readily reflect the teaching processes and disciplinary practices teachers employ in such schools.

Furthermore, Type B effects may also reflect the disciplinary practices and school ethos within schools – certain schools, net of Type A effects, will adopt schooling practices that are less conducive to academic performance compared to schools with the same characteristics. If true, Bourdieu may have been right in attributing some difference in performance to school culture, if not quite the dimensions of culture he envisioned.

Disadvantage or school ethos?

Cultural explanations such as those posited by Bourdieu would attribute socio-economic differentials in academic performance to a disconnect between the cultural capital of the education system and that of lower-SEP students. However, it may also be that performance differentials reflect factors correlated with social background, such as access to economic resources, and their effect on educational outcomes. For example, the Family Stress Model (FSM) asserts that differentials in academic performance may have their roots in the higher financial strain experienced by lower-SEP households, and the effect this strain has on family relationships (Conger & Donnellan, 2007). According to the FSM model, poor relationships in the family can lead to externalising behaviours on the part of the child with consequences for their behaviour in school. Children from lower-SEP households are therefore more likely to exhibit conduct and behavioural difficulties in

response to their family difficulties, negatively affecting their school outcomes (Kiernan & Huerta, 2008). Given that DEIS schools disproportionately draw on students from socio-economically disadvantaged communities, we anticipate that principal reported behavioural difficulties among the student body will be higher in DEIS schools than in non-DEIS schools:

H2: *DEIS schools will have a greater proportion of students with behavioural difficulties.*

We anticipate that the performance disadvantage experienced by DEIS schools reflects both the characteristics of their disproportionately socio-economically disadvantaged intake (Type A effects), and also school-level ethe and disciplinary practices, net of Type A effects, that exacerbate those disadvantages (Type B effects). We therefore expect that there will be a correlation between student characteristics and the ethos and disciplinary practices employed by a school, with ethos and disciplinary practices reflecting the prevalence of behavioural difficulties in the student population. As such, we anticipate that schools with behavioural difficulties will adopt more punitive disciplinary policies (higher use of suspension and expulsion) and less positive school ethe (less collegiate relationships between teachers and pupils) owing to the more adversarial nature of the relationship between teachers and students:

H3: *Schools with greater proportion of students with behavioural difficulties will adopt more punitive disciplinary policies and less positive school ethe.*

Furthermore, since we hypothesise that the negative effect of DEIS schools on academic performance (net of student characteristics) will be explained by the more punitive school disciplinary practices and less positive ethe of these schools.

H4: *Adjusting for DEIS status, school ethos and disciplinary practices will be associated with student academic performance.*

Disentangling effects

DEIS school status is anticipated to be negatively associated with academic performance. But does this reflect a peer effect that drives better or worse performance, or is it that non-DEIS schools with a more advantaged student intake are more likely to adopt school ethos and disciplinary practices that are conducive to better academic performance, with the opposite true for DEIS schools? In order to ascertain whether differences between DEIS and non-DEIS schools are driven by variations in student characteristics, or whether school disciplinary practices and ethos determine discrepancies net of student factors, it is important to disentangle school composition effects from school attributes.

However, separating the effect of school ethos from school composition is not simple if the proportion of disadvantaged students in a school is associated with a less positive school ethos and more punitive disciplinary practices. Furthermore, students do not randomly select into schools with a higher composition of lower-SEP students. If lower-SEP students or those with behavioural difficulties select into schools with stricter disciplinary approaches, this too would confound the relationship, making it difficult to disentangle the effect of school ethos from the effect of school composition.

Indeed arguments have been put forward that the observed Type B effect, namely the effectiveness of the school, may not actually reflect the school attributes such as ethos and disciplinary practices, but rather indirectly measure school composition (Thrupp, 1999). Further questions have been raised as to whether composition effects exist at all, with concerns raised that it could reflect a ‘phantom effect’ that emerges on account of variance at the second level and ecological correlation (Harker & Tymms, 2004; Robinson, 1950).

Given the ethical and practical challenges of an experimental design where students are randomly assigned schools with varying composition and ethos (Garrido et al., 2014), we

can instead side-step the selection issue by adopting a quasi-experimental approach using observational data: statistically stratifying individuals on covariates that predict selection into treatment (in this case, DEIS school attendance) and then comparing outcomes for those who were ‘treated’ compared to those who remained ‘untreated’ who nonetheless had the same propensity to attend a DEIS school. This can be achieved using propensity stratification techniques which allow us to statistically adjust for a child’s propensity to select into treatment (i.e. DEIS schools), enabling us to isolate the effect of the treatment net of other possible predictors.

Data and Methods

Sample

Data from the first three waves of the Child Cohort of the Growing Up in Ireland (GUI98) longitudinal study were used in the analyses. GUI98 is a nationally representative observational dataset of children born in 1998, their parents, and their schools in the Republic of Ireland. Wave 1 interviews took place from late 2007 and the start of 2008, when children were nine years old and in primary education. Wave 2 interviews, conducted from the end of 2011 to the start of 2012, took place when children were thirteen years old and after they had transitioned into secondary school. Wave 3 data was collected between 2015 and 2016, when children were in the senior cycle of secondary education, having completed their Junior Certificate examinations that marked the end of the junior cycle of secondary school.

Approximately one in every seven nine-year-old children in the Republic of Ireland were included in the initial sample of 8,568 children, with selection following a two-stage process where primary schools were selected first, and then students sampled from within schools. To ensure accurate representation of key school characteristics, schools were

systemically stratified by a range of variables, including disadvantaged status, religious denomination, gender mix and location. Up to forty students were subsequently selected at random from each school.

The initial sample of 8,568 nine-year-old students and their families dropped to 7,525 (88%) in Wave 2 and 6,216 in Wave 3 (73%). Of this number, 70% of initial respondents were present in all three waves, giving a balanced sample of 6,039. In order to identify whether school characteristics in Wave 2 affected academic performance (measured in Wave 3), the sample was further conditioned to exclude students who switched schools from Wave 2 and Wave 3, leaving a final analysis sample of 5,336 (62%)². Retaining only students who remained in the same school from Wave 2 to Wave 3 also excludes any students who did not remain in school into the senior cycle. While senior cycle student retention levels are high in DEIS schools, with over 80% of students in DEIS schools continuing to senior cycle, this is lower than the greater than 90% of students in non-DEIS schools who continue into senior cycle (Weir & Kavanagh, 2018). This uneven selection into senior cycle raises issues of selectivity in our conditioning of the sample. However, if such selection affects were to affect our analysis, we would anticipate that it would minimise the ‘treatment’ effect, as it can be expected that the DEIS students who opted against proceeding to the senior cycle were more likely to be disengaged with education or disinterested in academic goals. As such, the selective attrition of these lower-achieving students should raise the performance averages of the schools, thereby reducing the achievement gaps between DEIS and non-DEIS schools.

² All analyses were also run on the balanced sample of 6,039 students for robustness checks.

Irish context

Secondary education in Ireland is highly centralised, with students taking state-level standardised examinations at the end of their third year (Junior Certificate) and sixth year (Leaving Certificate), the latter exams determining entry into higher education. However, within this highly standardised system, schools are provided with a large degree of autonomy in their approach to discipline, teacher-student engagement and the academic climate (Smyth, 1999, 2016).

Dependent variable

Academic performance: Academic performance was measured using student performance in the Junior Certificate examinations, a set of standardised examinations taken by students at the end of the junior cycle of secondary education at about age 15. Students typically sit between 9 and 13 subjects, taking exams at two possible difficulty levels – Higher and Ordinary. Two compulsory subjects, namely mathematics and Irish, can also be taken at a lower, Foundation level. These exams mirror the structure of the Leaving Certificate examinations taken at the end of the senior cycle that are used to determine entry into higher education and specific courses, whereby ‘points’ are calculated through a combination of performance in the Leaving Certificate examinations and the level at which subjects were examined at. We replicate the points scheme using Junior Certificate results, assigning 70 to 100 points to students on the basis of their grade (D to A) in a subject taken at Higher Level, 40 to 70 points if a student sits a subject at Ordinary Level, and 10 to 40 points for subjects sat at Foundation Level, providing a scale ranging from 20 to 1190.

Treatment variable

DEIS school status: Our treatment variable is whether or not a student attends a DEIS

school. Secondary schools are selected for the DEIS programme on the basis of the proportion of enrolled students eligible for free health care (qualification for which is determined by household income), Junior Certificate retention rates, Junior Certificate performance and Leaving Certificate retention rates. Treatment is measured using a dichotomous measure, where attending a DEIS school is 1, and attending a non-DEIS school is 0.

Independent variables

Ethos: We define ethos as the school's pedagogical environment as developed by the teacher-student relationship and engagement. School ethos was evaluated by combining measures of teacher-student relationship as reported by students in Wave 2. Students responded to the questions:

- You are told by a teacher that your work is good
- You are encouraged to ask questions in class
- A teacher praises you for answering a question
- You are asked a question in class by the teacher.

All responses were coded in a four-point propensity scale, where 1 implies never and 4 implies very often. A confirmatory factor analysis was conducted to examine whether the observed items loaded onto the corresponding ethos latent variable. All factor loadings were statistically significant, with standardised coefficients ranging from 0.36 for *You are asked a question in class by the teacher*, to 0.72 for *You are told by your teacher that your work is good* (CFI = 0.967, RMSEA = 0.076, SRMR = 0.641).

A scale was created by summing the four different scales into a single measure of ethos and dividing by 4, giving a scale of 1 to 4.

Disciplinary Practices: Our measure for disciplinary practices is developed from principal-reported responses to ten different measures of disciplinary practices schools might employ, and whether they are used often/occasionally or rarely/never: *suspension, expulsion, extra class homework, extra homework, writing lines, detention, exclusion from sports, verbal report to parents, written report to parents, warning card*. We used prevalence weighting to apply greater weight to measures that were less commonly used (e.g. expulsion) and lower weights to commonly used disciplinary practices (e.g. verbal report to parents), summing the prevalence weights to create a continuous measure, centred on 0. Further details on how the scale was created are available in the appendix.

Problem behaviours in school: This was evaluated using principal-reported prevalence of student behavioural difficulties in the school at age 13. Four categories of problem behaviour were given: none; less than 10% of students; 10 to 25% of students; more than 25% of students. Few schools reported either ‘none’ or ‘over 25% of students’, thus categories were collapsed to create a dichotomous scale of ‘less than 10% of students’ and ‘more than 10% of students’.

School religious denomination: School denomination was reported as Catholic; Church of Ireland (Anglican); multi-denominational; interdenominational; other. As approximately two-thirds of the sample attended a Catholic school, we collapsed values of all other religious denominations non-Catholic to create a Catholic dummy variable.

Treatment of missing values

Missing values have the potential to bias estimates. Furthermore, the cumulative impact of missing values in several variables can lead to the exclusion of a significant segment of the original sample, to the loss of statistical precision and power (Sterne et al., 2009). Missing values in both independent and dependent variables, in line with recommended practice

(Lang & Little, 2016), were therefore dealt with through multiple imputation (20 iterations) using chained equations (MICE) in Stata 15. To ensure that missingness was random, models were estimated using both listwise deleted and imputed samples, with no major differences observed between results.

Weighting

Data is reweighted using weights developed by the Growing Up in Ireland Study team to reflect population characteristics and account for inter-wave attrition. Weights use a minimum information algorithm to fit population attributes in a regression framework to adjust the sample estimates so that they match population characteristics using sixteen dimensions adopted from census data.

Analytical strategy

Our treatment variable, namely whether or not a child attends a DEIS school, is not independent of confounders such as the child's own socio-economic background, whether the child attended a low-income primary school, and whether the child comes from a deprived neighbourhood. The most rigorous approach to ascertain whether attending a DEIS school has an effect independent of confounders would be to conduct a randomised control trial, with children randomly assigned to DEIS or non-DEIS schools. However, given the ethical and practical barriers to such an approach, we instead adopt propensity stratifying techniques that statistically adjust for a child's propensity to select into treatment. Such an approach allows us to compare the treatment effect between children who had an equal probability of being selected into treatment based on their observed characteristics at baseline, thereby more accurately isolating the net treatment effect (Rosenbaum & Rubin, 1983). Propensity scores were calculated using thirteen variables from Wave 1 when the student was still in primary school, that literature indicated were predictive of selection into DEIS secondary schools: primary school composition, mother's

age, chronic illness, household income, neighbourhood deprivation status, household type, parents' education, child maths performance, child reading performance, child conduct problems, child hyperactivity/inattention, child peer relationship problems and child emotional symptoms. Adopting the approach taken by Layte (2021), propensity scores were stratified into ten strata, allowing school composition effects to be compared within strata of observations sharing the same propensity to select into DEIS schools.

In order to control for all between-strata differences that could bias the estimates, fixed effects models predicting academic performance were run within strata. The fixed effects model is defined as:

$$y_{ij} - \bar{y}_j = \beta_0 + \beta(x_{ij} - \bar{x}_j) + \varepsilon_{ij} \quad (2)$$

where y_{ij} is the points achieved by student i in strata j , $\bar{y}_j$ is the mean points within a strata, x_{ij} is a vector of independent variables and $\bar{x}_j$ is the strata mean of those variables, and ε_{ij} is the idiosyncratic error.

Six models were specified:

1. Baseline model: DEIS status
2. Model 2: DEIS status + school disciplinary practices + religious denomination
3. Model 3: Model 2 + school ethos
4. Model 4: Model 3 + school problem behaviour
5. Model 5: Model 4 + interaction between DEIS status and school disciplinary practices, DEIS status and problem behaviour, and problem behaviour and school disciplinary practices
6. Model 6: Model 5 + interaction between DEIS status, school disciplinary practices and school problem behaviour

Model 1 provides the raw estimates in performance between matched students attending DEIS and non-DEIS schools, indicating the total effect of DEIS status. Model 2 seeks to explain the extent to which differences between DEIS and non-DEIS schools reflects disciplinary practices, adjusting also for school denomination as potential confounder. Model 3 evaluates how much of the raw differential in performance is accounted for when adjusting for school ethos, as well as providing an estimate of the effect of school ethos itself. Model 4 further adjusts for whether the school has a high proportion of students with behavioural difficulties, which may explain the adoption of disciplinary practices and ethe. Model 5 includes a range of interactions: DEIS status interacts with school disciplinary practices in order to ascertain if the effect of punitive school disciplinary practices on student performance is conditional on school status; DEIS status interacts with problem behaviours to ascertain if the effect of problem behaviours on child performance is heightened in DEIS schools; school disciplinary practices interacts with school problem behaviour, to ascertain if the effect of disciplinary practices on student performance is affected by the existence of problem behaviours in the school. Model 6 includes a three-way interaction (between DEIS status, school disciplinary practices and behavioural difficulties) to evaluate if the relationship between school behavioural difficulties and punitive disciplinary practices are stronger in DEIS schools versus non-DEIS schools.

Results

Descriptive results

Table 4. 1: Summary statistics. Note: Data unweighted and unimputed.

Variable	N	Mean (SD)	Min	Max
Points (Wave 3)	5,274	752.24 (149.5)	20	1190
Sex	5,336			
Male		0.49	0	1
Female		0.51	0	1
School status	4,930			
Non-DEIS		0.87	0	1
DEIS		0.13	0	1
School denomination	5,114			
Catholic		0.66	0	1
Other		0.34	0	1
School discipline	5,336	0 (0.19)	-0.31	0.58
School ethos	5,287	2.78(0.55)	1	4
Proportion of students attending school where:	5,075			
less than 10% of student have behavioural difficulties		0.79	0	1
greater than 10% of student have behavioural difficulties		0.21	0	1
Household class	5,336			
Professional and higher managerial		0.17	0	1
Lower managerial and technical		0.41	0	1
Non-manual		0.18	0	1
Skilled manual		0.11	0	1
Semi and Unskilled		0.12	0	1

Table 4. 2: Mean points acquisition by category. Note: Data weighted and imputed

Variable	Mean points	Confidence Intervals	Mean points (DEIS)	Confidence Intervals	Mean points (Non-DEIS)	Confidence Intervals
Population Mean	714.19	709.73, 718.64	606.72	592.40, 621.03	737.34	733.03, 741.66
Sex						
<i>Male</i>	702.85	696.55, 709.14	608.57	589.37, 627.77	724.01	717.76, 730.26
<i>Female</i>	726.28	720.01, 732.54	604.60	583.11, 626.09	751.35	745.45, 757.25
School denomination						
<i>Catholic</i>	728.83	723.59, 734.08	625.74	600.01, 651.47	738.19	732.99, 743.39
<i>Other</i>	689.52	681.48, 697.57	598.78	581.57, 616.0	735.38	727.65, 743.11
Proportion of students attending school where:						
<i>less than 10% of student have behavioural difficulties</i>	731.91	727.24, 736.59	657.90	638.57, 677.23	741.55	736.90, 746.20
<i>greater than 10% of student have behavioural difficulties</i>	654.24	643.32, 665.15	555.26	535.47, 575.05	716.81	705.61, 728.02
Household class						
<i>Professional and higher managerial</i>	805.12	797.50, 812.74	785.35	752.47, 818.23	807.14	799.33, 814.96
<i>Lower managerial and technical</i>	757.40	751.14, 763.67	681.79	654.01, 709.58	764.57	758.31, 770.84
<i>Non-manual</i>	723.72	714.62, 732.81	641.69	606.0, 677.38	736.38	727.6, 745.16
<i>Skilled manual</i>	645.05	631.39, 658.70	583.50	557.15, 609.86	673.54	658.24, 688.83
<i>Semi and Unskilled</i>	634.00	620.50, 647.51	546.65	518.87, 574.44	673.97	659.95, 687.99

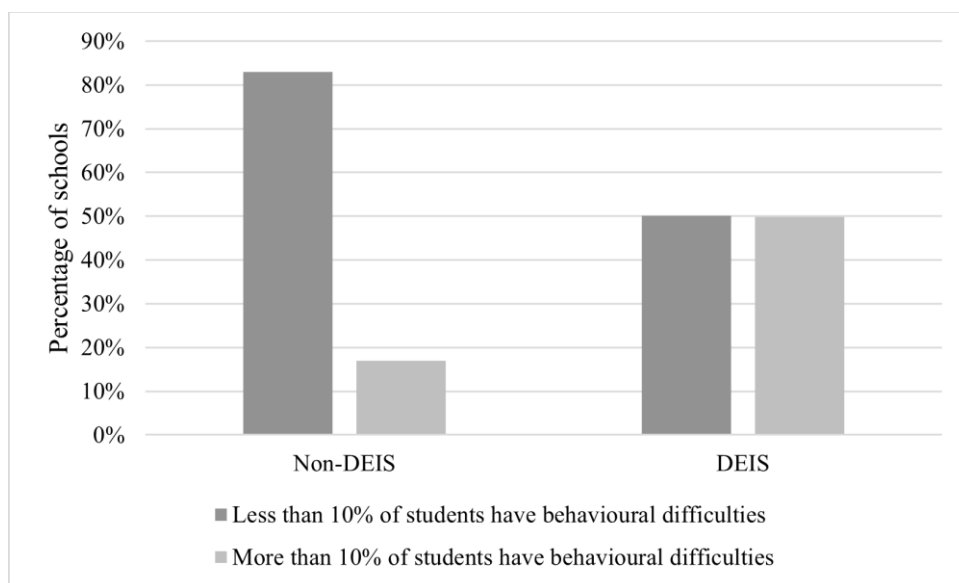
Table 4. 1 provides summary statistics of the analytical sample, using unweighted and unimputed data. Points had a distribution of 20 to 1190 points, with the sample nearly evenly split between boys (49%) and girls (51%). 13% of students attend DEIS schools,

while two-thirds of the sample attend Catholic denomination schools. The vast majority of students attended schools where principals reported less than 10% of students had behavioural difficulties, while the majority of the students in the sample hailed from *Professional and higher managerial* or *Lower managerial and technical households*.

Table 4. 2 provides mean points (Junior Certificate performance) obtained by students, broken down by categories, using multiple imputation and population weights. Overall children from *Professional and higher managerial* class backgrounds attending non-DEIS schools attained the highest mean points (807.14), while children from *Semi and Unskilled* backgrounds who attended DEIS schools having on average the lowest mean points (546.65). Across both DEIS and non-DEIS schools, Catholic denomination schools outperform non-Catholic schools, while schools with a lower proportion of students with behavioural difficulties also achieve higher average points. This pattern is largely replicated when looking at performance within DEIS and non-DEIS schools. In line with Hypothesis 1, mean student performance is worse across all categories in DEIS schools versus non-DEIS schools, although it should be noted that these figures show raw gaps and do not adjust for potential confounders. Within DEIS schools, mean performance by boys is slightly higher than for girls, while within non-DEIS schools students from the lowest *Semi- and Unskilled* and *Skilled Manual* household classes attain the same performance.

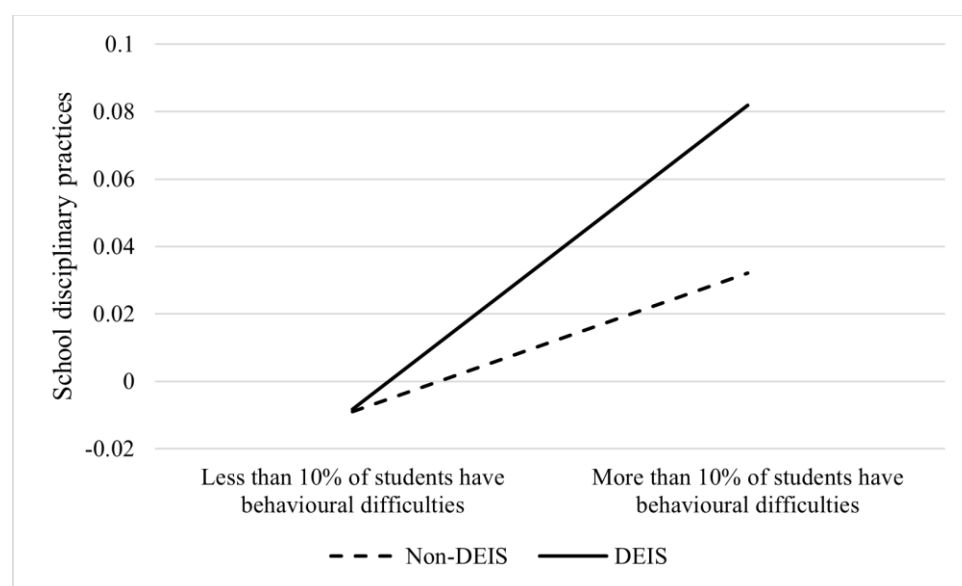
We hypothesised that schools with a high proportion of students from lower-SEP backgrounds will report that a greater proportion of their student body experiences behavioural difficulties. Figure 4. 1 provides support for this hypothesis, with over 80% of non-DEIS schools reporting low behavioural difficulties (i.e. less than 10% of students having behavioural difficulties), while only half of DEIS schools reported low levels of behavioural difficulties.

Figure 4. 1: Proportion of schools with student behavioural difficulties, by school type. Note: Data weighted and imputed.



It is therefore possible that DEIS/non-DEIS differences in disciplinary climates reflect DEIS schools' disproportionately high intake of students with behavioural difficulties, which may lead to the school adopting stricter disciplinary practices. Figure 4. 2 shows the relationship between school disciplinary practices (centred) and behavioural difficulties, by school DEIS status. While disciplinary practices appear relatively similar in both DEIS and non-DEIS schools when principals report that they have lower levels of behavioural difficulties (i.e. under 10% of students exhibit behavioural difficulties), in schools with higher behavioural difficulties (i.e. more than 10% of students exhibit behavioural difficulties), disciplinary climate is substantially stricter in DEIS schools than in non-DEIS schools.

Figure 4. 2: School disciplinary practices by school type and reported school behavioural difficulties. Note: Data weighted and imputed.



To further ascertain how school disciplinary practices interact with school ethos in non-DEIS and DEIS schools respectively, we divide ethos into three quantiles, providing a scale of least, medium and most responsive ethe. These three quantiles of school ethe are plotted against three quantiles of school disciplinary practices, labelled as least punitive, moderately punitive and most punitive, with mean points acquisition by ethos and disciplinary practice quantiles shown in Figure 4. 3 for non-DEIS schools, and Figure 4. 4 for DEIS schools. Overall patterns indicate that students in stricter schools perform worse than students in less strict schools. For non-DEIS schools, students who experience more responsive school ethos perform better than students that experience a less responsive school ethos irrespective of school disciplinary practices except in the most punitive environments, where medium responsiveness is slightly higher, with the highest points acquisition being for students in a least-punitive school with the best school ethos. The highest points acquisition in DEIS schools is observed in schools with a medium responsive school ethos and medium punitive disciplinary practices. However, in DEIS schools with stricter disciplinary practices, having the most responsive ethos appears to yield higher points.

Figure 4. 3: Mean points acquisition by school disciplinary practices and ethe, Non-DEIS schools. Note: Data weighted and imputed.

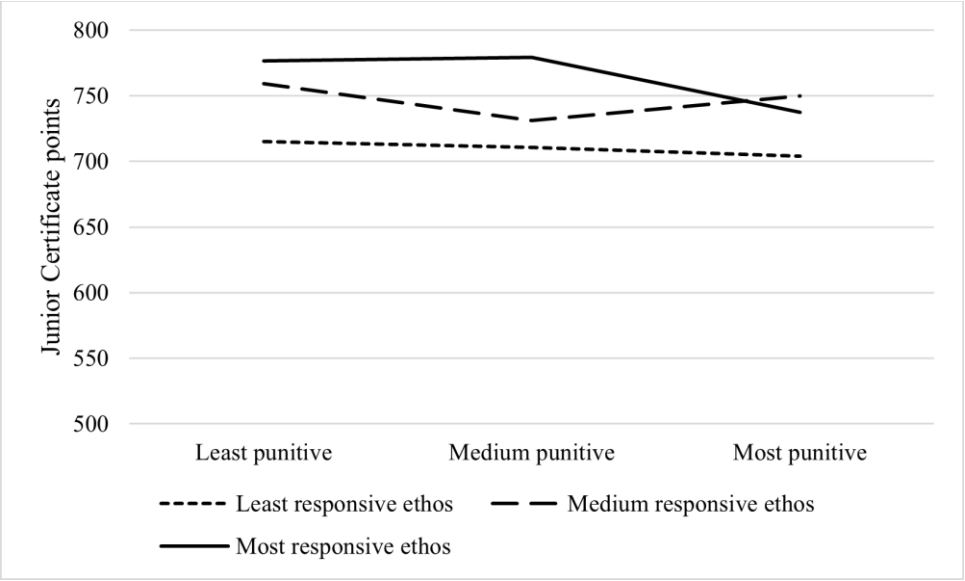


Figure 4. 4: Mean points acquisition by school disciplinary practices and ethe, DEIS schools. Note: Data weighted and imputed.

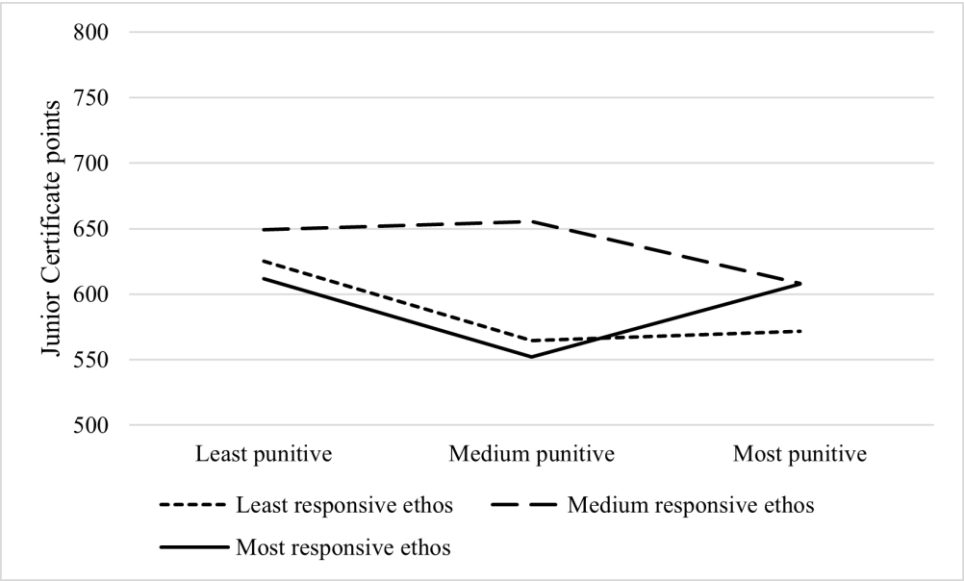
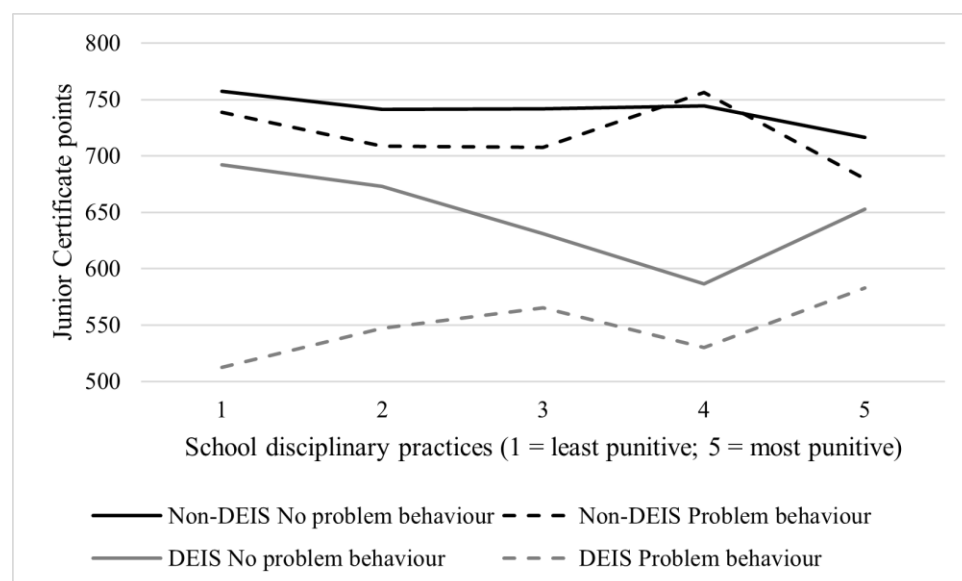


Figure 4. 5 further examines the relationship between school disciplinary practices (broken down into quintiles) by DEIS and non-DEIS schools and between schools reporting high levels of behavioural difficulties in a school (over 10% of students) versus low levels of

behavioural difficulties (under 10% of students), with mean points for each combination indicated on the vertical axis. Gaps in academic performance emerge between DEIS and non-DEIS schools net of the behavioural difficulties of the students. Furthermore, within DEIS/non-DEIS schools, schools with a greater proportion of students exhibiting behavioural difficulties perform worse than those with under 10% of students holding behavioural difficulties. However, while school disciplinary practices do appear to have a slight negative association with academic performance in non-DEIS schools and DEIS schools that have low behavioural difficulties, in DEIS schools with a high level of behavioural difficulties, more punitive disciplinary practices appear to have a positive effect on points acquisition. This finding suggests that the less punitive school disciplinary practices that appear to be associated with higher performance in other schools have no meaningful effect on performance in DEIS schools with high levels of behavioural difficulties, albeit as these figures provide comparisons without controls, issues of endogeneity could be affecting the comparisons.

Figure 4. 5: Points acquisition by school composition, disciplinary practices and behavioural difficulties (Under 10% of student body has behavioural difficulties = No problem behaviour; Over 10% of student body has behavioural difficulties = Problem behaviour). Note: Data weighted and imputed.



Propensity score matching

The balance of propensity scores across treatment and comparison groups can be seen in Table 4. 3. The association between pre-treatment variables and selection in DEIS schools are substantially reduced between control and treatment groups. Furthermore, after propensity score matching, all observed biases are statistically insignificant at the 5% level, indicating that the non-random probability of selecting into DEIS schools are successfully adjusted for. Figure 4. 6 graphically illustrates the bias before and after propensity matching.

Table 4. 3: Balance of propensity scores. T-tests are for equality of the means in the two samples, based on a regression of the variable on a treatment indicator. $V(T)/V(C)$ shows the variance ratio (for continuous covariates) of treated over non-treated. This ratio should equal 1 if there is perfect balance.

Variable	Unmatched/ Matched	Treated	Mean Control	%bias	% bias reduced	t-test t	p>t	V(T)/ V(C)
DEIS Primary school (Baseline: DEIS primary school - urban band 1)								
DEIS primary school - urban band 2	U	0.08563	0.04476	16.6		4.6	0	.
	M	0.08576	0.09977	-5.7	65.7	-0.9	0.371	.
DEIS primary school – rural	U	0.08273	0.02496	25.8		8.04	0	.
	M	0.08285	0.05927	10.5	59.2	1.7	0.089	.
Non-DEIS primary school	U	0.67489	0.90058	-57.4		-16.95	0	.
	M	0.67587	0.69425	-4.7	91.9	-0.73	0.463	.
Class (Baseline: Professional and higher managerial)								
Lower managerial and technical	U	0.28447	0.43125	-31		-7.34	0	.
	M	0.28488	0.2822	0.6	98.2	0.11	0.912	.
Non-manual	U	0.2148	0.18464	7.5		1.89	0.059	.
	M	0.21512	0.18989	6.3	16.4	1.16	0.245	.
Skilled manual	U	0.18578	0.12309	17.4		4.56	0	.
	M	0.18605	0.19417	-2.3	87	-0.38	0.701	.
Semi and unskilled	U	0.23803	0.09684	38.5		10.96	0	.
	M	0.23692	0.22683	2.7	92.9	0.44	0.658	.
Mother's age	U	38.176	40.612	-46		-11.88	0	1.31*
	M	38.185	38.763	-10.9	76.3	-1.93	0.054	1.05
Chronic illness	U	0.11466	0.09232	7.3		1.86	0.062	.
	M	0.11483	0.11088	1.3	82.3	0.23	0.817	.
Log income	U	9.6034	9.8993	-60.3		-14.43	0	0.88
	M	9.6041	9.6306	-5.4	91.1	-0.98	0.325	0.83*
Haase neighbourhood deprivation (Baseline: Haase neighbourhood deprivation band 1)								
Haase neighbourhood deprivation band 2	U	0.13208	0.16355	-8.9		-2.11	0.035	.
	M	0.13227	0.14149	-2.6	70.7	-0.5	0.619	.
Haase neighbourhood deprivation band 3	U	0.19158	0.1289	17.1		4.47	0	.
	M	0.19186	0.21345	-5.9	65.6	-1	0.319	.
Haase neighbourhood deprivation band 4	U	0.19448	0.14095	14.4		3.7	0	.
	M	0.19477	0.16598	7.7	46.2	1.39	0.165	.
Haase neighbourhood deprivation band 5	U	0.27866	0.10566	45		12.88	0	.
	M	0.27762	0.25381	6.2	86.2	1	0.318	.

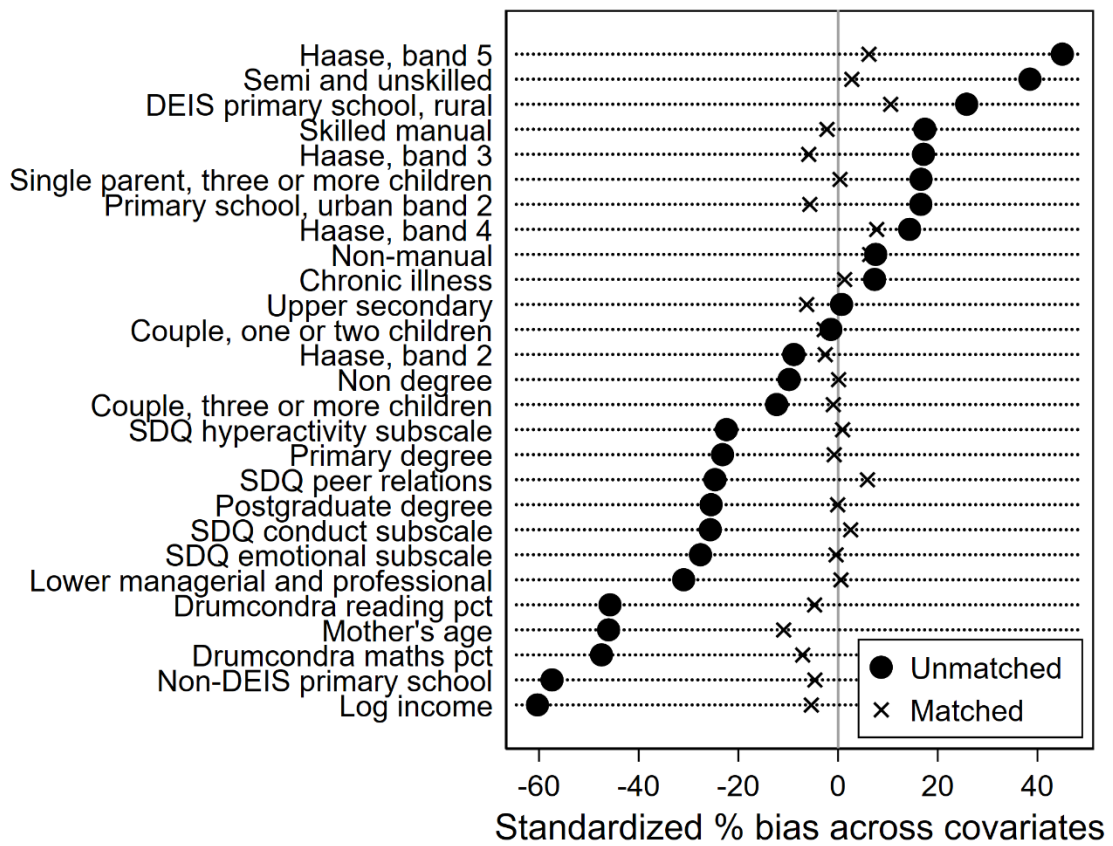
Family type (Baseline: Single parent, one or two children)

Single parent, three or more children	U	0.05806	0.02496	16.6		4.82	0	.
	M	0.05814	0.05739	0.4	97.7	0.06	0.953	.
Couple, one or two children	U	0.37155	0.37852	-1.4		-0.35	0.725	.
	M	0.37064	0.38423	-2.8	-95	-0.52	0.603	.
Couple, three or more children	U	0.47605	0.53755	-12.3		-3.02	0.003	.
	M	0.47674	0.48168	-1	92	-0.18	0.855	.

Parental education (Baseline: None to lower secondary)

Upper secondary	U	0.31785	0.31461	0.7		0.17	0.864	.
	M	0.31831	0.34768	-6.3	-806.4	-1.16	0.248	.
Non degree	U	0.21626	0.25802	-9.8		-2.36	0.019	.
	M	0.21657	0.21624	0.1	99.2	0.01	0.988	.
Primary degree	U	0.10885	0.19109	-23.2		-5.25	0	.
	M	0.10901	0.11185	-0.8	96.6	-0.17	0.867	.
Postgraduate degree	U	0.4644	0.11534	-25.5		-5.49	0	.
	M	0.4651	0.0468	-0.1	99.6	-0.03	0.98	.
SDQ conduct	U	8.4668	8.8506	-25.6		-6.79	0	1.48*
	M	8.4718	8.4345	2.5	90.3	0.43	0.671	1
SDQ hyperactivity	U	6.6117	7.1652	-22.4		-5.67	0	1.19*
	M	6.6096	6.5879	0.9	96.1	0.16	0.875	1.03
SDQ peer relations	U	8.5796	8.9405	-24.7		-6.25	0	1.18*
	M	8.5819	8.4963	5.9	76.3	0.96	0.338	0.73*
SDQ emotions	U	7.5269	8.0889	-27.6		-7.1	0	1.29*
	M	7.5291	7.5378	-0.4	98.4	-0.07	0.94	0.99
Drumcondra maths percentile	U	49.935	59.814	-47.5		-11.84	0	1.1
	M	49.979	51.461	-7.1	85	-1.27	0.205	0.93
Drumcondra reading percentile	U	64.26	73.936	-45.7		-11.86	0	1.33*
	M	64.298	65.299	-4.7	89.7	-0.83	0.407	1.04

Figure 4. 6: Standardised % of bias across covariates, before and after propensity matching.



Model Results

Table 4. 4: Academic performance in Junior Certificate examinations. Note: Estimated using multiply imputed data (20 iterations).

	I		II		III		IV		V		VI	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
	Coef (SE)	Coef (SE)	Coef (SE)	Coef (SE)	Coef (SE)	Coef (SE)	Coef (SE)	Coef (SE)	Coef (SE)	Coef (SE)	Coef (SE)	Coef (SE)
DEIS school (baseline: non-DEIS)	-41.555** (12.022)	-38.104* (11.915)	-37.275** (11.296)	-31.700* (10.950)	-34.784* (11.130)	-32.139* (11.070)	-30.447* (10.743)	-29.812* (11.466)	-9.976 (13.702)	-0.991 (9.323)	-8.911 (13.796)	-1.201 (8.995)
Discipline (centred)			-24.235 (15.147)	-10.278 (17.731)	-25.304 (16.124)	-8.283 (17.262)	-21.781 (16.105)	-6.889 (17.391)	-28.343 (14.800)	-6.808 (18.084)	-19.969 (14.352)	-0.418 (18.036)
Catholic (baseline: non-Catholic)			10.312 (5.410)	13.141 (5.914)	10.349 (4.896)	-8.283 (17.262)	9.699 (4.849)	11.867 (5.799)	9.839 (4.783)	12.905* (5.586)	10.363 (4.711)	12.796* (5.615)
Ethos					40.142*** (5.013)	39.220*** (3.882)	40.029*** (4.892)	39.182*** (3.927)	39.948*** (4.781)	39.865*** (4.085)	40.516*** (4.789)	40.003*** (4.067)
Over 10% behavioural difficulties (baseline: Under 10% behavioural difficulties)							-17.337 (8.431)	-11.070 (7.395)	-10.901 (8.253)	4.633 (5.740)	-8.243 (7.665)	3.607 (5.439)
Two-way interactions												
DEIS School*Centred Discipline (baseline: non-DEIS)									-28.961 (54.068)	-79.842 (75.996)	-117.572 (81.063)	-138.611 (74.465)
DEIS School*Problem behaviours (baseline: non-DEIS, no problem behaviour)									-46.819* (17.908)	-72.099** (18.765)	-58.564* (20.648)	-77.742** (19.352)
Problem behaviours* Centred Discipline (baseline: no problem behaviour)									52.798 (32.896)	72.656 (48.426)	6.518 (38.384)	33.078 (43.969)
Three-way interaction												
DEIS School*Centred Discipline*Problem behaviour (Baseline: non-DEIS, no problem behaviour)											239.546 (164.989)	176.399 (89.929)
Constant	740.792*** (1.636)	770.836*** (1.512)	734.237*** (3.528)	760.931*** (3.754)	624.449*** (12.725)	650.390*** (12.966)	628.378*** (12.720)	652.795*** (12.911)	626.997*** (12.468)	647.830*** (13.942)	626.997*** (12.468)	647.817*** (13.838)
Observations	2,625	2,711	2,625	2,711	2,625	2,711	2,625	2,711	2,625	2,711	2,625	2,711
Number of strata	10	10	10	10	10	10	10	10	10	10	10	10

Robust standard errors in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

The propensity score stratifying creates ten strata of students with matched propensity of attending a DEIS school, adjusted for confounders that could bias results. Fixed effects models are then run within strata to predict student performance in the Junior Certificate exams, thereby estimating change in variables within strata of matched students.

Table 4. 4 provides the coefficients for the predictors of both boys' and girls' academic performance in the Junior Certificate examinations at age 15, as measured in points accrued. Model I shows the total effect of attending a DEIS school. Both boys and girls who attend DEIS schools perform significantly worse, acquiring on average 38 (girls) and 42 (boys) points less than their peers in the same strata who attended non-DEIS schools. Using the points standard deviation figure in Table 4. 1 ($SD = 149.5$), this equates to a difference of over a quarter of a standard deviation in points between DEIS and non-DEIS schools.

Model II tests for whether more punitive disciplinary practices are associated with worse academic performance, and if this accounts for some of the DEIS total effect estimated in Model I. The model also adjusts for school denomination as a potential confounder. While part of the DEIS effect was reduced in this model, contrary to our hypothesis school disciplinary practices are statistically insignificant for both boys and girls. Model III adds the ethos scale variable, enabling us to evaluate both the degree to which ethos affects performance, and the extent to which the DEIS effect reflects differences in ethos. The initial DEIS effect remains largely stable for both boys and girls following adjustment for school ethos, indicating that ethos does little to explain the observed DEIS effect. School ethos is positively associated with academic performance, with a one unit increase in ethos (scale of 1 to 4) equal to an increase of 40 points for both boys and 39 for girls – approximately a quarter of a standard deviation change in points. We further hypothesised that schools with a greater proportion of students with behavioural difficulties would adopt

stricter disciplinary practices and harsher school ethos. Model IV therefore adjusts for the proportion of students with behavioural difficulties in the school. Behavioural difficulties are not a statistically significant predictor of points for either boys or girls, while the DEIS school effect remains largely stable and statistically significant net of behavioural difficulties for both sexes, indicating that DEIS school effects do not reflect greater behavioural difficulties existing in DEIS schools compared to non-DEIS schools. School ethos also stays largely stable, indicating that school ethos effects exist independent of behavioural difficulties in the school. We hypothesised that DEIS schools would be more likely to adopt a more punitive disciplinarian focus, and that this would explain part of the initial DEIS effect. Similarly, it could be that student performance was affected by interactions between DEIS status schools and problem behaviours, and between problem behaviours and disciplinary practices. We therefore include three interactions in Model V. The interactions between DEIS status and disciplinary practices, and between problem behaviour and disciplinary practices are insignificant for both boys and girls. However, there is a negative and statistically significant interaction between DEIS status and problem behaviours relative to the baseline of non-DEIS schools with no problem behaviours – with the former pairing scoring 47 and 72 points less than the latter pairing for boys and girls respectively. The effect of DEIS, conditional on problem behaviours and centred disciplinary practice being zero, is statistically insignificant.

In our descriptive analysis, Figure 4. 5 indicates that performance remains largely stable for students in non-DEIS schools both with and without behavioural difficulties, irrespective of the disciplinary practices employed. DEIS schools with no behavioural difficulties appeared to have a somewhat negative association between school disciplinary practices and performance, with more punitive disciplinary practices largely associated with lower performance. In contrast, a predominantly inverse relationship was found for

DEIS schools with behavioural difficulties, where the lowest mean performance was in schools with the least punitive disciplinary practices, while the highest performance was in schools that adopted the most punitive disciplinary practices. This indicated that the effect of disciplinary practices on performance might be contingent both on the school type (i.e. DEIS/non-DEIS) and the preponderance of problem behaviour in the school. To test this, a three-way interaction between DEIS school status, school behavioural difficulties and school strictness was included in Model 6, however the interaction is statistically insignificant.

Discussion

This paper sought to answer three questions. First, does school type, as measured by DEIS school status, influence individual exam performance net of students' individual characteristics and social background? Second, is the effect of DEIS schools accounted for by the prevalence of young people with behavioural difficulties in the school, and the interaction of the level of behavioural difficulties in the school with the disciplinary practices of the school? Third, adjusting for school disciplinary practices, does school ethos, measured as the quality of relationships between teachers and students, also influence student performance in state examinations?

In answering these questions we were able to draw on high-quality, longitudinal data on child and school characteristics that allowed us to adjust for the selection process, which in turn leads to the non-random distribution of young people across secondary schools in Ireland by family, social and economic position. Descriptive results suggested that DEIS school effects may be present: students who attended a DEIS school performed worse relative to their peers in non-DEIS schools. Furthermore, our fixed effects models, run

within strata which adjusted for propensity of students to attend DEIS schools, showed that this effect remained largely stable net of confounders in our models.

Our models attempted to understand the cause of the DEIS effect through the addition of possibly explanatory variables. Our descriptive analyses showed that DEIS schools have a higher proportion of pupils with behavioural difficulties and, perhaps in response, also tend to have more punitive disciplinary practices. In our fixed effects models, more punitive disciplinary practices are not by themselves significantly associated with performance in state examinations, nor was a statistically significant interaction observed between DEIS status and disciplinary practices, or between problem behaviour and disciplinary practices. However, a strong interaction was observed between DEIS status and problem behaviour in the school, indicating that students in DEIS schools with a high level of problem behaviour performed substantially worse relative to their peers in non-DEIS schools without problem behaviours. Lastly, a three-way interaction between DEIS status, school disciplinary practices and school behavioural difficulties was similarly found to be insignificant. In contrast to school disciplinary practices, school ethos retains a positive and statistically significant effect for both boys and girls in all models.

Furthermore, this effect remains largely stable even after adjusting for confounders, indicating that the school ethos has an effect independent of other school characteristics.

Two clear observations can be garnered from our models. First, school type, as measured by DEIS school status, is causally associated with both boys' and girls' academic performance (as measured by points accrued), even when adjusting for the student's characteristics/background and other potential explanatory variables such as school ethos and behavioural difficulties. Second, while the DEIS effects appear to remain net of school ethos characteristics, school ethos still matters. Furthermore, this effect is at least partially independent of DEIS status, behavioural difficulties and school disciplinary practices.

The stability of DEIS effects net of child background characteristics that were adjusted for in the propensity stratification process, and the inclusion of potentially explanatory variables in the fixed effects estimation, leaves open the question as to what could be explaining these differences. A possible explanation could be that peer effects work to drive down performance in DEIS schools, where mean student aspirations might be lower, and drive up performance in non-DEIS schools, where a more competitive and academically focused school and peer environment drives individual standards. This was not directly tested in our models, which instead focused on school factors such as the disciplinary climate and the ethos adopted by the school. Unfortunately, an evaluation of peer environment effects would require more granular detail both on the composition of schools, and the interaction of students with each other – data that is not present in the Growing Up in Ireland study.

Similarly, and potentially in tandem with peer effects, DEIS effects could reflect differing parental pressures on schools and teachers. International literature indicates that parental engagement with teachers varies substantially by SEP, with Lareau (2003) stipulating that a central tenet of the *concerted cultivation* parenting style of middle class parents was the adoption of an engaged with teacher and schools in an attempt to get the best outcomes for their children. While our models adjusted for selection into DEIS schools, it could be that non-DEIS schools receive more proactive engagement and pressure from parents to assist their children's progress – the outcome of which is that teaching and learning standard improve across the school.

While our models adjusted for student selection into DEIS schools, we were also not able to account for teacher selection into schools. It could be that poorer performance of DEIS schools does not reflect the ethos or disciplinary practices of the school, but rather the ability of DEIS schools to attract and retain the calibre of teachers non-DEIS schools are

able to. Unfortunately, our dataset did not include variables that would have enabled us to ascertain whether such parental and teacher effects existed, while the adoption of a fixed effects analysis within strata would have made a multilevel model infeasible should we have had the data in the first place.

Important limitations in our analyses need to be acknowledged when interpreting results. First, variables are either school (principal) or student reported, with accuracy of responses potentially affected by subjective evaluation of respondents. For instance, school strictness and behavioural difficulties scale were both constructed from principal evaluation of the school, leading to the potential of school behavioural difficulties being over/under-estimated by the principal. Similarly, school factors determined by the school, such as disciplinary practices, could reflect principals' subjective evaluation of behavioural difficulties in the school, which are also measured by principals' responses. Furthermore, it is possible that our variables were not suitable proxies for the concepts we wished to measure. For instance, our measure of school ethos was derived from student reported measures of teacher-student interactions, which might not accurately reflect school-level ethos. As such, it is possible that factors such as school ethos do indeed account for some of the observed DEIS effect, but that our construction of an ethos measure did not adequately capture it.

Second, as alluded to above, while propensity score stratification successfully reduces the majority of selection bias, a potential issue is that our propensity stratification does not fully account for selection in DEIS schools. For instance, while school proximity is an important determinant when it comes to parent selection of secondary schools, parents have the opportunity to actively select the secondary schools in which to enrol their children. While proximity remains the primary determinant of secondary school selection for lower-SEP households, higher-SEP households are more active in their search and

choice of secondary schools (Hannan et al., 1996; Smyth, 2016). Factors correlated with parents' active selection of schools could potentially explain part of the DEIS effect observed. While the adoption of propensity score stratification attempted to account for the non-random nature of selection into DEIS schools, it is potential that unobserved variables that were not accounted for in the estimation of the propensity score strata are behind the observed DEIS effects. While alternative methods, such as randomised control trials, are clearly unfeasible for the study of school, composition and ethos effects, results from quasi-experimental approaches such as propensity score matching should be interpreted with caution.

Conclusions

Understanding the role of the school in producing educational differences in student performance is a classic question in social science and education research: do 'schools matter' or is performance driven by student social background characteristics. This study has sought to supplement the literature addressing this question by exploring the role of DEIS status schools in Ireland, and the role that ethos and school disciplinary practices may play in producing these DEIS school effects. Using propensity score stratification techniques to overcome selection bias, our findings indicate that DEIS schools hold a performance penalty net of social background confounders, school disciplinary practices and school ethos. Nonetheless, even adjusting for these other effects, school ethos significantly predicts students' performance.

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Appendix

Construction of discipline scale:

Ten variables on school disciplinary practices were employed in the construction of the single disciplinary practices scale. These variables reflected principal responses to whether the school used the following methods as a method of punishment: suspension, expulsion, extra classwork, extra homework, writing lines, detention, exclusion from sport, verbal reports, written reports, warning cards. These variables were dichotomised, so that 1 implied these punishments were used often/occasionally, and 0 that they were used rarely/never. Some items were used by most schools (e.g. verbal report), while others were used by only a few schools (e.g. expulsion). To account for the different severity of the distinct forms of punishment, the variables were re-weighted, so that least common forms of punishment (e.g. expulsion) were weighted higher than more common items (e.g. verbal report). The sum of the probability weights (i.e. all disciplinary practices are used) is equal to 1, while none of the disciplinary practices are used is equal to 0. For instance, a verbal report was given the value 0.005, while expulsion was given the value 0.25. The table below shows the value provided for each item rounded to two decimal places, which added together equals 1 (small deviation owing to rounding).

Variable	Value post weighting
Suspension	0.11
Expulsion	0.25
Extra classwork	0.05
Extra homework	0.05
Writing lines	0.20
Detention	0.18
Exclusion from sport	0.18
Verbal reports	0.01
Written reports	0.02
Warning cards	0.13

Study IV: Constrained by Choice: Social Class and Subject-Level Selection in the Irish Secondary Education System

Abstract

A body of research has observed socio-economic patterns in student decision-making in education, net of their prior performance; lower-SEP students tend to make less-ambitious and less-rewarding selections compared to their more advantaged peers. Research on such differences have largely focused on decision-making at branching points in education (e.g. selection into academic or vocational streams in school, exiting education entirely, etc.), with a variety of explanations, ranging from culturally-determined ambitions to risk-aversion mechanisms, hypothesised to account for observed differences. Less-explored, however, is how students with the same aspirations make different decisions that affect their chances of realising them. This study contributes to existing literature on SEP inequalities in student decision-making by exploring their subject difficulty-level selections, the consequence of which affects the chances of a student progressing to higher education. Using data from Wave 3 of Cohort98 of Growing Up in Ireland conditioned on whether the student intends to attend higher education (N = 4,981; 52% female, age 17/18), our analysis indicates that net of prior performance and cognitive ability, lower-SEP students more readily select easier but less rewarding subject-level selections than their higher-SEP peers, damaging their prospects of realising their aspirations of attending higher education. Our findings are discussed, with potential explanatory mechanisms suggested.

Constrained by Choice: Social Class and Subject-Level Selection in the Irish Secondary Education System

The twentieth century witnessed a major expansion in the provision of education, leading to near universal access to primary and secondary education in the developed world (Roser & Ortiz-Ospina, 2016). Higher education has followed this trajectory but to a lesser extent, with the increasing accessibility of further and higher education reducing the attainment gap between students from different social backgrounds (Breen & Jonsson, 2005). Yet even with increasing education accessibility and a reduction of the socio-economic attainment gap, class differentials in educational attainment have remained, with the social origin of students still a major determinant of educational progression (Breen et al., 2009; Breen & Jonsson, 2005). Furthermore, despite higher education becoming increasingly accessible to students from lower socio-economic backgrounds, other inequalities have garnered research attention. For example, research suggests that the career returns to higher education vary significantly across different higher education institutions (Lucas, 2001, 2009).

The majority of existing literature on the maintenance of inequalities has focused on the socio-economic differentials in student selection into academic vs vocational tracks in school (Breen et al., 2014; Lievore & Triventi, 2021; Stocké, 2007), or the decision to opt for higher education (Breen & Yaish, 2006; Erikson et al., 2005; Jackson et al., 2007).

Less research attention has been given to the question of why disadvantaged students with the same ability and ambition to attend higher education as their more-advantaged peers, appear less able to make this goal a reality. This paper seeks to contribute to the literature on the development of educational inequalities by exploring the curricular decision-making processes of Irish secondary level students net of primary effects, that is, net of prior academic achievement (Boudon, 1974). To do this, we use data from the Growing Up

in Ireland Cohort98, a nationally representative dataset of children in Ireland, to evaluate the decision-making processes of students who aspire to attend higher education.

Socio-economic differences in student decision-making

Using the framework developed by Boudon (1974), the pervasiveness of socio-economic inequalities in education attainment can be classified into distinct primary and secondary effects of social origin. Primary effects reflect the association between social background and a student's academic performance at each stage of education: students from higher socio-economic backgrounds perform better on average than their peers from lower socio-economic backgrounds (Goldthorpe, 1996; Jackson et al., 2007; van de Werfhorst & Hofstede, 2007). Secondary effects (the primary focus of this paper) are the differences in the educational choices taken by students from different social backgrounds that perpetuate inequalities, given the options available to them as a function of prior performance (Breen & Goldthorpe, 1997; Bukodi et al., 2021).

It could be anticipated that both primary and secondary effects would have reduced in line with the expansion and increased accessibility of education systems in developed countries. For instance, increased access to preschool and primary education together with improving living conditions should increase the educational performance of children from lower socio-economic backgrounds (Breen et al., 2009; Burger, 2010; Heckman, 2006). Similarly, free education, coupled with increased supports for students in education such as grants or student loans, would be expected to reduce the secondary effects of social origin (Goldthorpe, 1996; van de Werfhorst & Hofstede, 2007).

There is international evidence of increasing participation rates among students from lower socio-economic backgrounds in higher education (Osborne, 2003). Yet among all this change, the association between social background and educational attainment has not

disappeared and in some countries has hardly weakened (Breen et al., 2009). Furthermore, even as ceiling effects limit the ability of students from higher socio-economic backgrounds to increase their educational advantage, secondary effects have been observed to manifest themselves in other ways; even as near-universal progression to higher education eliminates ‘quantitative’ (years in education) inequalities, students from more advantaged backgrounds are able to maintain these advantages through ‘qualitative’ differences. In the theoretical process termed *effectively maintained inequality* (EMI) (Lucas, 2001, 2009), advantaged students are posited to select quantitatively similar amounts of qualitatively superior goods. In the context of progression to higher education, this manifests itself in students from socio-economically advantaged backgrounds selecting more prestigious and better quality institutes of higher education, and in enrolling into more selective courses of study.

The persistence of such differences in student outcomes has motivated a large body of literature that has attempted explain the continuation of secondary effects of social origin (e.g. Bukodi et al., 2021; Gabay-Egozi et al., 2010; Stocké, 2007). Orthodox economic explanations have often approached the topic of student selection into higher education from a rational decision-making perspective, motivated by utility maximization which is itself the function of an evaluation of the perceived costs and benefits associated with such a choice and the probability of success (Gigerenzer et al., 2001; Selten, 2001). Under this approach, students weigh up the benefits of attaining higher education against the risks of non-completion and the costs associated with prolonging education. Students with better achievement in secondary school are, *ceteris paribus*, more likely to select into higher education, while students who performed less well will seek to diversify from education into other areas. Furthermore, as the direct and indirect costs associated with education decrease, it could be anticipated that the perceived costs of pursuing higher education will

fall, making it a more attractive option to students from lower socio-economic backgrounds who may otherwise have been dissuaded from pursuing higher education.

The oft-repeated finding that lower socio-economic students are less likely to select into higher education, even once prior performance is accounted for, would militate against the uncritical adoption of this rational choice framework. The shortcomings of an orthodox rational decision-making model led to the development of adapted rational choice models that account for underlying contextual differences in the decision-making process. One such approach, the Bounded Rationality model, is derived from the work of Herbert Simon (1972, 1978) who hypothesised that decision-making is not motivated by a goal of utility maximisation, but rather by what the actor perceives to be a satisfactory outcome.

Furthermore, in contrast to the presumption of full information that typifies orthodox rational choice models, a bounded rationality explanation hypothesises that actors' decisions are affected by four constraints: first, their knowledge of the choices available to them; second, their ability to utilise this knowledge; third, to cope with uncertainty; and fourth, to choose between competing wants. These limitations lead individuals to make decisions that attempt to attain satisfactory, as opposed to utility maximising, outcomes – a process referred to as 'satisficing'. As such, a bounded rationality approach would indicate that the choices of an actor are rational only in so far as they are adapted to the structure of an environment, the amount information that is available to the actor, and his/her ability to use it (Selten, 2001; Simon, 1957, 1978).

Such contextual constraints in both access to information and ability to utilise it, draw parallels with both Bourdieu's concept of habitus (Bourdieu, 1977; Lizardo, 2004) whereby decision-making is shaped by collective and social structures, and also with Lareau's differentiation between the 'concerted cultivation' parenting style of higher socio-economic parents, and the more laissez-faire 'natural growth' approach of lower

socio-economic parents (Lareau, 2003). Lareau in particular theorised that higher socio-economic parents were heavily engaged in their children's educational activities and decision-making processes, while lower socio-economic parents were less likely to direct their children's choices or contest teacher assessments of their children's abilities or aptitude for education. As such, while both might have similar ambitions, higher socio-economic students are more likely to be given the skills, information and support to make more effective decisions to realise those ambitions, while lower socio-economic students are more reliant on less-tailored school-based sources of information. Furthermore, it can be anticipated that parental advice will be more effective when coming from parents who have progressed successfully through education themselves and who are able to draw on their own knowledge and experience, while parents without this knowledge will have less relevant information by which to structure their advice. Termed by Lareau as knowing the "rules of the game", students of more advantaged upbringing are thereby able to draw on previous experience with and knowledge of the workings of these institutions, providing them with an environmental advantage that less advantaged students are unable to draw upon (Lareau, 2003, 2015; Lareau & Weininger, 2003).

Access to suitable information and the ability to interpret it effectively is a key component of a bounded rationality explanation, yet whether such contextual differences fully explain differentials in student decision-making is contestable. Breen and Goldthorpe (1997) have put forward a specific form of bounded rationality through which to explain the secondary effects of socio-economic position on educational decision-making which they refer to as 'Relative Risk Aversion' (RRA). This assumes that decision-making in education is determined, first and foremost, by the motivation of the young person and their family to avoid downward social mobility. What is perceived as downward social mobility, and therefore what is viewed as a satisfactory outcome, is determined by the socio-economic

position of the actor making the decision. If motivated primarily by an underlying aversion to downward mobility, the risk associated with pursuing more ambitious educational options (e.g. direct costs, earnings forgone, risk of failure) may be viewed as unnecessary and to outweigh the benefits of continued education by a lower socio-economic student (Breen et al., 2014). In contrast, the risk associated with selecting into more ambitious choices are evaluated as necessary by higher socio-economic students, as failure to do so will increase the risk of downward social mobility, the underlying motivation behind the decision-making process.

Following this line of thought, the RRA explanation would suggest that socio-economic differences will be greatest at lower and middle-levels of the ability distribution, and smallest at the top where students from all social backgrounds will have greater confidence in their ability to succeed, and therefore will be more likely to select ambitious options such as the pursuit of higher education. However, for students of lower ability, those from lower socio-economic backgrounds will be less able to rely on their ability to mitigate the increased risk and will therefore be more likely to perceive the risk to be unnecessarily high relative to their high-ability peers. In contrast, higher socio-economic students of the same ability will need to take the more ambitious pathway if they are to avoid downward social mobility. Furthermore, the socio-economic resources their position provides them with will also enable them to protect against the risk (and more readily absorb the costs) of possible failure (Bernardi, 2012).

Decision-making among higher-education aspiring students

The processes influencing the decision to attend higher education have dominated the literature on the secondary effects of social background, but progression into higher education is not merely the product of the evaluation of perceived risks and benefits, but

also relies on students and their families making other choices which may be influential for entry into higher education, such as the correct curricular selections. Research has identified socio-economic differentials in the choices made by students in school that can affect their chance of progression, with higher socio-economic students making more effective decisions that increase their opportunities of progression (Gabay-Egozi et al., 2010). Socio-economic differences in the effectiveness of curricular choices may reflect student differences in the availability of guidance or mentoring across groups, but they may also be influenced by RRA if less effective curricular choices are also lower risk choices.

Bounded Rationality theories such as RRA have largely been applied to explaining student decision-making at educational branching points, but in this article we seek to apply this mechanism to explain within-school curricular choices of students aspiring to attend higher education. We explore whether socio-economic differences in curricular selections that affect progression opportunities are themselves the product of risk-avoidance mechanisms as might be hypothesised by the RRA process, or instead the result of socio-economic variation in the availability of information, guidance and mentoring.

Irish context

To answer this question, we explore the decision-making processes of students in Irish schools at age 17/18 who report an intention to attend higher education. The Irish education system is classified as largely standardised, undifferentiated and lacking a formal tracking system (Smyth, 2016; Smyth & Banks, 2012). This means that, in theory, all students sitting the end of secondary education matriculation exams (Leaving Certificate) are eligible to progress to higher education (Smyth & Banks, 2012). However, in practice, entry into higher education is limited by the *numerus clausus* system

employed, with applicants for higher education courses ranked on the basis of their performance in these Leaving Certificate examinations, with the highest-ranking applicants offered a place. Ranking is determined through a ‘points’ system, where points are based on the grade obtained and the difficulty level at which the subject was examined.

With some exceptions to account for recent immigration status or learning difficulties, all students are obliged to take English, Irish and mathematics as core subjects, and supplement the compulsory subjects with a selection of elective subjects (on average four other subjects), with the grades from the best six subjects counting toward the final ‘points’ tally. Subjects are examined at two levels, *Higher* and *Ordinary*, with mathematics and Irish also being examined at a third lower difficulty level, *Foundation*. All subjects with the exception of mathematics are graded out of a possible 100 points at higher level, while the possible maximum points acquisition at ordinary level is 60. At *Foundation* level in mathematics and Irish, a maximum of 20 points can be obtained. To encourage students to pursue STEM careers, a further 25 bonus points are added to the higher-level mathematics results, allowing a maximum of 125 points to be obtained. Table 5. 5 in the Appendix provides a breakdown of points system.

The points system is structured such that the highest possible performance at ordinary level is awarded the same point value as a performance at the middle/lower end of the spectrum at higher level. For mathematics, any pass grade obtained at higher level is awarded more points than the best possible performance at ordinary level. Given that subject selection has only a limited effect on eligibility to progress into higher education (Iannelli et al., 2016), the level at which a subject is sat becomes the most significant curricular choice open to students that can affect their chances of entry into higher education. As such, a student aspiring to higher education should rationally opt to sit their subjects at higher level in order to maximise their potential points acquisition, although this will interact with

prior achievement and ability. However, literature on the Irish education system shows that there remain distinct socio-economic differences in curricular-level selection among students by socio-economic background, with students from lower socio-economic backgrounds selecting lower difficulty levels far more frequently than their higher socio-economic peers (Klein et al., 2016; Smyth, 2018). Given the marked socio-economic differences in selection into higher and ordinary levels and the persistence of primary effects, we hypothesise that these socio-economic differences will persist, even after adjusting for a student's intention to progress into higher education (H1).

We also anticipate that contextual limitations, such as access to sources of information, will explain part, but not all, of this differential. It could be that students from higher socio-economic backgrounds more readily select difficult yet better rewarding subject-level choices, net of ability, because they have access to more effective sources of advice and support, while the opposite is true for lower socio-economic students. Furthermore, a student's perception of what constitutes an ambitious subject level could also be informed by their subjective appraisal of their ability relative to others. Students are nested in the 'adolescent society' of the school environment (Coleman, 1971), and perceived ability is likely to be evaluated by comparing their own performance to peers in the school. We therefore hypothesise that part of the socio-economic difference in student selection of higher-level subjects will be accounted for by adjusting for the students' sources of advice and subjective appraisal of their own ability, but that socio-economic differentials will continue to exist (H2).

Our interpretation of the RRA hypothesis proposes that socio-economic differentials are most marked among students of low to average ability, since higher ability reduces the perceived risk of failure, *ceteris paribus*. While we expect students of higher prior performance in a subject to select the higher, more difficult subject level irrespective of

socio-economic background, we anticipate that lower and average ability students will select into higher level if they are from a higher socio-economic position, whilst lower socio-economic students of the same ability will more readily select ordinary level (H3).

Data and Variables

Data

Growing Up in Ireland Cohort98 (GUI98) is an ongoing nationally representative longitudinal study of children and their parents in the Republic of Ireland, with the first wave of interviews taking place at the end of 2007 to the start of 2008, with participants subsequently re-interviewed in 2011-12 (Wave 2) and 2017/18 (Wave 3).

The sample was drawn from a total resident population of approximately 56,500 nine-year-olds registered in the 2006 census, with the sample size of 8,568 representing approximately 14% or one in every seven nine-year-olds residing in the country (Thornton et al., 2016). Schools were randomly selected, with all nine-year old students eligible for participation in schools with less than 40 nine-year-old students, with schools with more than 40 nine-year-olds being selected using a probability proportionate to size sampling method where the size of the school increased its probability of being selected for the study, but the number of students and upper threshold slightly reduced the probability of a study child in that school being selected for the final sample.

Interviews were conducted with study children and their parent(s)/guardian(s) at home, and with principals in schools. Parent(s)/guardian(s) are self-defined as primary and secondary caregivers in terms of level of care provision to the study child, with the primary caregiver in almost all instances being the study child's mother (biological or otherwise). Of the 8,568 families included in Wave 1, 7,525 were re-interviewed in 2011-12 for Wave 2 (88%), and 6,216 in Wave 3 (73%).

While the analysis in this paper is primarily cross-sectional in nature, exploring the subject-level choices taken by students during the Leaving Certificate cycle when they are approximately 17/18 years old, we also include variables of prior ability, measured when the student was approximately 13-years-old. We therefore only include students who have participated in both Waves 2 and 3 of GUI98, which reduces our sample 6,039.

Furthermore, while research has often looked at the total secondary effects of social origin, this study instead seeks to evaluate the extent to which secondary effects remain even when students share the same goals (i.e. the aspiration of attending higher education). This is facilitated by the aspiration to attend higher education being high across all socio-economic profiles, with the majority of students across all socio-economic backgrounds indicating that they aspired to attend higher education on completion of secondary level education. We therefore condition our sample to exclude students who indicate they do not intend to attend higher education, leaving us with a sample of 4,981.

Lastly, while the majority of schools offer higher level mathematics, Irish and English, some schools only offer these subjects at ordinary and (in the case of mathematics and Irish) foundation level. As this study seeks to evaluate why students who desire to attend higher education make different subject level choices, students attending schools where higher level was not offered in the subject are therefore excluded. This leaves a sample size of 3,889 for mathematics, 3,922 for English and 3,882 for Irish.

Variables

Outcome variables

Subject taken at higher level: Our outcome variables are whether three compulsory Leaving Certificate subjects (mathematics, English and Irish), are taken at higher level,

versus not at higher level. All three subject levels are coded as dichotomous variables, where *higher level* = 1.

Predictor variables

Sex: Biological sex is coded as a dichotomous variable, where *male* = 1 and *female* = 0.

Parental education: Relative Risk Aversion, as conceptualised by Breen and Goldthorpe (1997), views decision-making by students and their parents as a function of social class. To accurately ascertain the degree to which social class predicts educational decision-making, however, would require adjusting for the confounding relationship of parental education. Furthermore, parents' educational attainment can be anticipated to be associated with the quality of the educational advice provided to their children, with parents who have progressed successfully through education themselves able to draw on their own experiences when advising their children's educational choices. Given that parental education and social class are highly correlated, we use the highest level of education attained by the primary caregiver as our measure of socio-economic background. Education is classified into five categories: *Primary to low secondary*, *High secondary*, *Non degree*, *Primary degree* and *Postgraduate degree*. *Primary to low secondary* is the reference category in all models.

Ability: Child cognitive ability is measured using Matrices sub-test from the School Age Battery of British Ability Scales (BAS), taken by the student in Wave 2 of GUI98, when the study child would have been 13-years-old and in the early stages of secondary education. The matrices measure the non-verbal reasoning ability of the young person, providing a largely culture-free measure of ability that has been found to correlate well with IQ (Elliott et al., 1997). The variable is centred on zero.

Overall academic ability: Student academic ability is measured using the performance of the student in the Junior Certificate (JC) examinations - a set of standardised state examinations taken by students at the end of the third year of secondary education, when students were approximately 15 years old. Performance is calculated using the same scoring methodology of the Leaving Certificate, where points are applied on the basis of the grade and difficulty level at which the grade was achieved. Performance is z-score standardised, with the mean at 0 and a standard deviation equal to 1.

Academic ability in subject: Student academic ability in a particular subject is measured using the performance of the student in that subject in the Junior Certificate examinations. Performance is calculated using the same scoring methodology of the Leaving Certificate, where points are applied on the basis of the grade and difficulty level at which the grade was achieved. The variables are centred on zero.

Subjective performance: How the study child evaluated their own performance, relative to their peers, is measured using the student's self-reported evaluation of their performance in mathematics, English and Irish on a five-point scale: *Below average, Just below average, Average, Just above average, Above average*, with *Below average* used as the reference category in all models.

Parental expectation: Parental expectation that their child would attend higher education is measured using a dichotomous variable recoded from the question *How far do you expect study child to proceed in education*, with primary caregivers who respond *Child will do Higher Education* coded as 1 and all other responses coded as 0.

Child paid tutoring: Whether the child received paid tuition (known as 'grinds' in Ireland) outside of school is measured using a dichotomous variable, where 1 implies

having received paid tuition in the past year. No information is available on the subject in which assistance was received or whether this tutoring was in a group or private format.

Source and importance of guidance: Sources of career guidance and the importance of each type of guidance is evaluated using student responses to the questions *How important was Class Guidance/Parental Guidance/Friend Guidance in helping you to decide what to do after school?*. Importance of each form of guidance is ranked as either *Very important*, *Important* or *Not very important*, with the importance of a specific type of guidance coded as *Not very important* for students who indicated they did not receive that type of advice.

Control variables: While our first model does not include any confounders, subsequent models adjust for whether the study child had Behavioural Difficulties/ADHD, and whether the study child had Chronic Illness. Furthermore, as some schools with socio-economically disadvantaged intake (known as DEIS schools) have specialised advisory outreach, we further control these models for whether the school was DEIS status or not.

Treatment of missing values

The exclusion of missing data by only analysing complete cases can lead to biased analyses, while the cumulative effect of missing data in several variables can result in the exclusion of a significant proportion of the original sample at the cost of both analytical precision and statistical power (Sterne et al., 2009). To avoid this, missing variables are imputed using multiple imputation by chained equations (MICE) in Stata 15 (20 iterations) using a set of auxiliary variables.

Weighting

Non-random inter-wave attrition can lead to an unrepresentative sample and biased estimation (Solon et al., 2015). As such, all models are re-weighted to reflect a population characteristics using weights developed by the Growing Up in Ireland study team (Murphy

et al., 2019). The weights adjust sample estimates to reflect population parameters using sixteen dimensions drawn from census data.

Analytical strategy

Five logistic regression models are run in a sequential approach, outlined below:

Model 1: Sex + Parental education

Model 2: Model 1 + BAS matrices + Subject JC performance + Behavioural difficulties + Chronic illness

Model 3: Model 2 + School type + Subjective performance + Parental expectation + Paid tutoring + Importance of guidance

Model 4: Model 3 + Parental education*BAS matrices

Model 5: Model 3 + Parental education*JC subject performance

Model 1 provides a baseline model, where total effects of parental-education are estimated adjusting only for student sex. Model 2 attempts to account for primary effects of social origin by adjusting for performance and ability indicators, as well as whether the child has any behavioural difficulties and chronic illness that might affect student selection of higher level.

Theories of bounded rationality hypothesise that actor choices are rational only in so far as they are adapted to the structure of the environment in which the decisions are being made, including accounting for the actor's access to information and their ability to adequately utilise that information. With selection of higher level being the rational choice for students who seek to attend higher education, model 3 seeks to account for observed differences in student selection of higher level by adjusting for environmental factors that could affect their decision-making process, such as access to suitable information, their

subjective evaluation of their own performance and whether the student had access to paid curricular assistance that could help them overcome academic limitations.

An RRA model anticipates that an underlying risk aversion will also motivate lower socio-economic background students to be averse to better-rewarding but higher-risk choices, and will only select these options should their ability be sufficient as to minimise the risk. In contrast, it is anticipated that higher socio-economic background students will be more likely to take better-rewarding but riskier choices, both as a result of their need to make more ambitious selections to avert class demotion, and on account of their social background making them better able to absorb the costs of potential failure. Our fourth and fifth models therefore test whether ability is a more important consideration for the selection of higher levels by students from lower socio-economic backgrounds than for students of higher socio-economic backgrounds by including an interaction between parental education and ability, with model 4 interacting on cognitive ability and model 5 interacting on prior performance in the subject the level of which is being predicted.

Results

Summary statistics of the analytical sample are included in Table 5. 1. The proportion of students taking higher level in the three compulsory subjects varies considerably by subject, from a little over half of the sample in mathematics, to nearly 90% in English. The sample is close to evenly split by sex, while *Higher secondary* educated primary caregivers are the largest parental-education category at 36%, with only 8% of primary caregivers having less than secondary education.

Table 5. 1: Summary statistics of analytical sample.
Note: Data unimputed and unweighted.

	n	Mean/Prop.	Freq.	SD	Min.	Max.
Higher Level mathematics	4785	.54				
Higher Level English	4796	.89				
Higher Level Irish	4539	.63				
Male	4981	.48				
<i>Primary caregiver education</i>	4946					
None to lower secondary		.08	406			
Hi Sec/TechVoc		.36	1767			
Non Degree		.22	1075			
Primary Degree		.21	1024			
Postgrad		.14	674			
SC has behavioural difficulties	4946	.01				
SC has chronic illness	4979	.12				
BAS Total Ability Matrices	4865	1.72		17.00	-106.37	44.63
JC performance, total	4941	.21		.84	-3.65	2.86
JC math performance	4871	6.40		29.67	-83.36	41.64
JC English performance	4895	3.20		16.23	-57.92	27.08
JC Irish performance	4711	3.15		21.81	-65.28	34.72
DEIS school	4637	.11				
<i>How well do you perform in math compared to children your age?</i>	4841					
Above average		.20	960			
Just above average		.24	1186			
Average		.36	1742			
Just below average		.15	734			
Below average		.05	219			
<i>How well do you perform in English compared to children your age?</i>	4840					
Above average		.22	1080			
Just above average		.32	1560			
Average		.38	1830			
Just below average		.06	309			
Below average		.01	61			
<i>How well do you perform in Irish compared to children your age?</i>	4608					
Above average		.23	1079			
Just above average		.27	1223			
Average		.36	1675			
Just below average		.10	447			
Below average		.04	184			
Do you expect your child to pursue Higher Education?	4830	.95				
Does the SC receive grinds?	5980	.46				
<i>How important was School Guidance in helping you decide what you wanted to do after school?</i>	4981					
Very important		.18	919			
Important		.37	1827			
Not very important		.45	2235			
<i>How important were your friends in helping you decide what you wanted to do after school?</i>	4981					
Very important		.23	1131			
Important		.40	1827			
Not very important		.37	1858			
<i>How important was your mother in helping you decide what you wanted to do after school?</i>	4981					
Very important		.60	3005			
Important		.29	1427			
Not very important		.11	549			

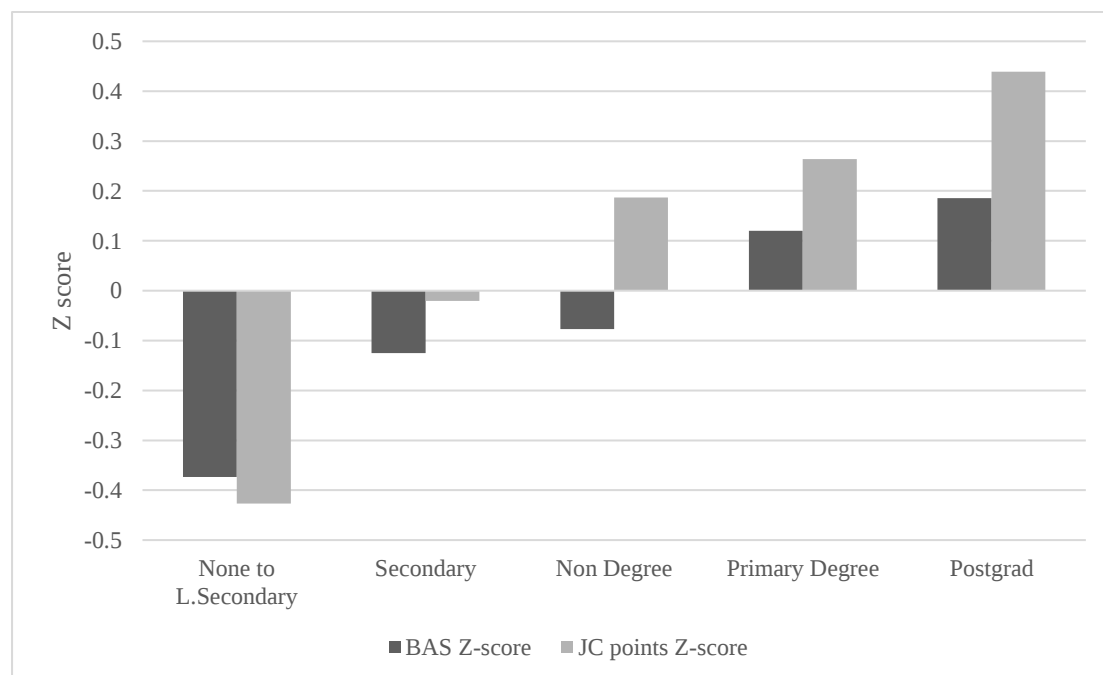
Subjective performance is skewed toward *Above average*, with 80%, 92% and 86% of students perceiving themselves to perform at or above average in mathematics, English or Irish respectively. 95% of parents expect their child to progress to higher education, while nearly half of the sample have received paid tuition outside of school. Mothers' guidance

is the most important form of information listed, with 60% of respondents indicating that it was very important in helping him/her to decide what to do after school, with only 18% and 23% of students indicating that school guidance and friend guidance respectively were very important.

We have argued that choosing to take higher-level subjects may depend, in part, on academic ability and prior educational performance. Figure 5. 1 illustrates primary effect differentials in student Junior Certificate performance and cognitive ability by parental education. As has been found in previous research, z-scores of BAS matrices indicate that cognitive ability differentials exist by parental education, with children with higher-educated parents having higher cognitive scores (McGinnity et al., 2015). Interestingly, this ability gap is larger when academic performance is measured, indicating that students from higher-educated households perform above their cognitive ability scores, while students from lower-educated households perform below their cognitive ability on average.

Figure 5. 1: Cognitive ability of students, as measured using British Ability Scale matrices (Z scored) and academic performance as measured through points accrued in Junior Certificate examinations (Z scored), by primary caregiver educational attainment.

Note: Data weighted and imputed.



We further anticipate that student perception of own academic performance will be informed by how the student views his/her performance relative to classmates and peers. Figures 5. 2, 5. 3 and 5. 4 indicate that lower socio-economic students self-evaluate their performance as above the sample average, whilst students with higher-educated parents tend to self-evaluate their ability as below the sample average. However, actual performance ability follows the opposite direction, with students of lower-educated parents performing on average close to one standard deviation below the mean in mathematics, with performance improving hierarchically up to *Postgraduate*, where performance is nearly 0.4 of a standard deviation above the mean mathematics performance. This pattern carries through in both English and Irish.

Figure 5. 2: Student performance in standardised Junior Certificate mathematics examinations (Z scored) and student self-perceived ability in mathematics relative to peers (Z scored), by primary caregiver educational achievement. Pairwise correlation between perceived maths ability and JC maths performance: -0.4067, statistically significant at $p < 0.05$. Note: Data weighted and imputed.

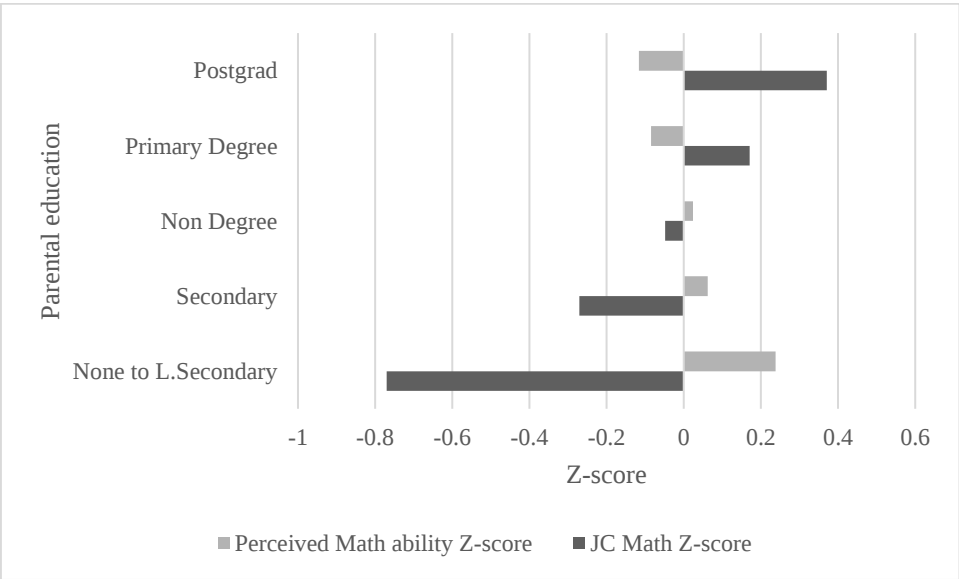


Figure 5. 3: Student performance in standardised Junior Certificate English examinations (Z scored) and student self-perceived ability in English relative to peers (Z scored), by primary caregiver educational achievement. Pairwise correlation between perceived English ability and JC English performance: -0.3466, statistically significant at $p < 0.05$. Note: Data weighed and imputed.

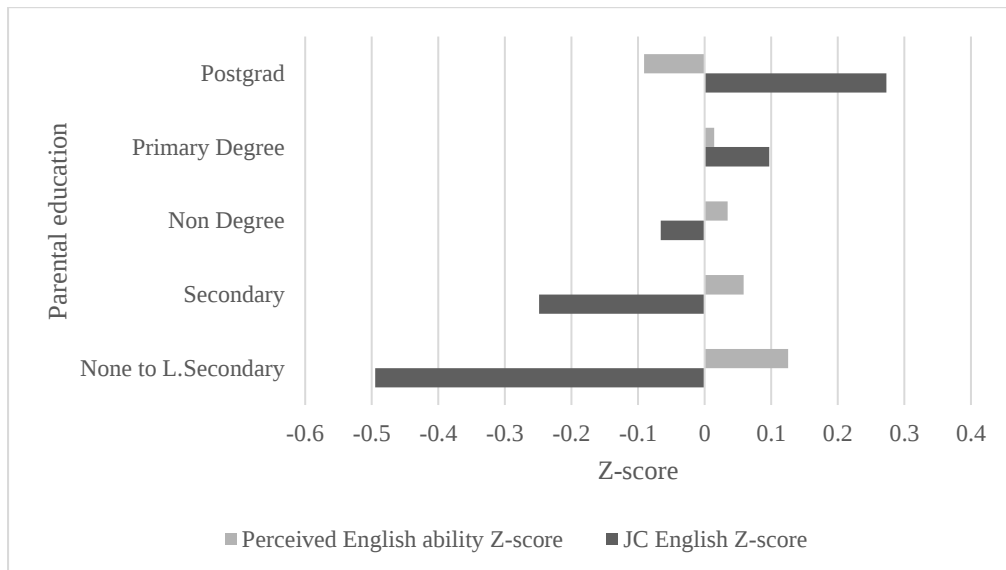
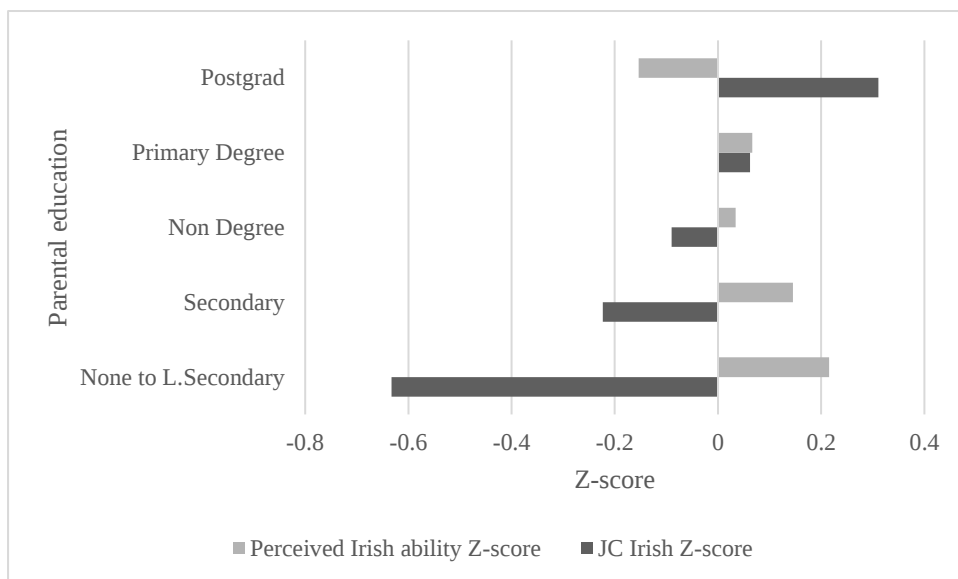


Figure 5. 4: Student performance in standardised Junior Certificate Irish examinations (Z scored) and student self-perceived ability in Irish relative to peers (Z scored), by primary caregiver educational achievement: Pairwise correlation between perceived Irish ability and JC Irish performance: 0.2987, statistically significant at $p < 0.05$. Note: Data weighed and imputed.



Figures 5. 5, 5. 6 and 5. 7 illustrate how students' perceived performance matches with selection into higher-difficulty level in that subject by parental education. Across subjects, students from higher-educated backgrounds are more likely to select into higher level at each perceived ability point than their peers from lower parental-education households. This is particularly striking in Figure 5, where over 80% of students from primary degree

or postgrad-educated households who perceive themselves to be above average in mathematics study the subject at higher level, while less than half of students from none to lower secondary-educated households who perceive themselves to be above average in maths study maths at higher level. This pattern is similarly observed in both English and Irish.

Figure 5. 5: Percentage of students sitting higher level maths, by parental education and self-perceived ability in maths relative to peers. Note: Data weighted and imputed.

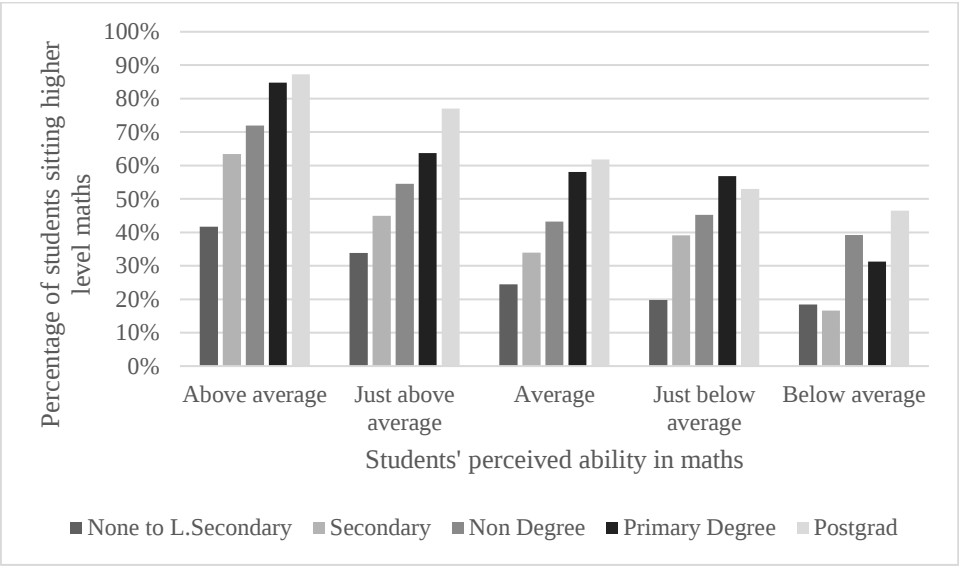


Figure 5. 6: Percentage of students sitting higher level English, by parental education and self-perceived ability in English relative to peers. Note: Data weighted and imputed.

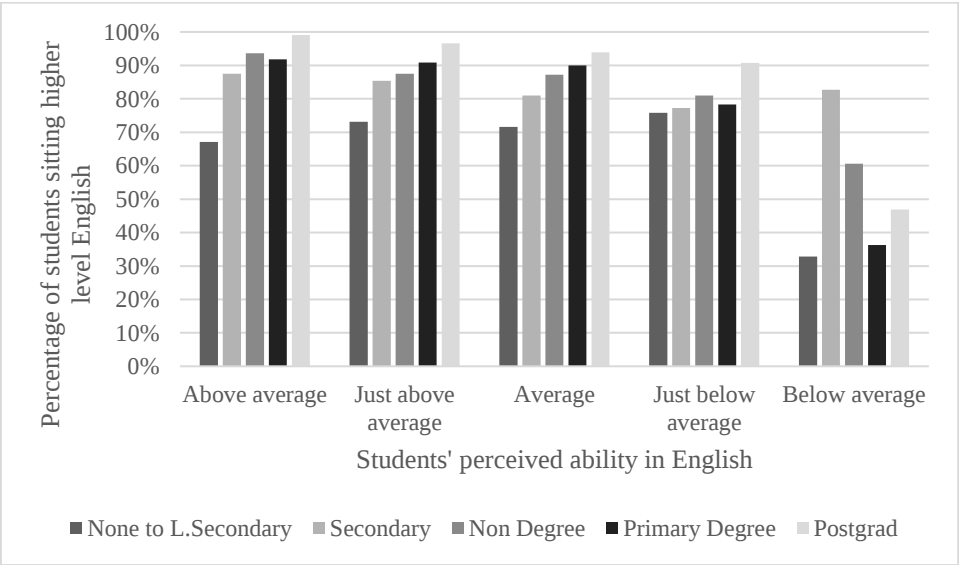
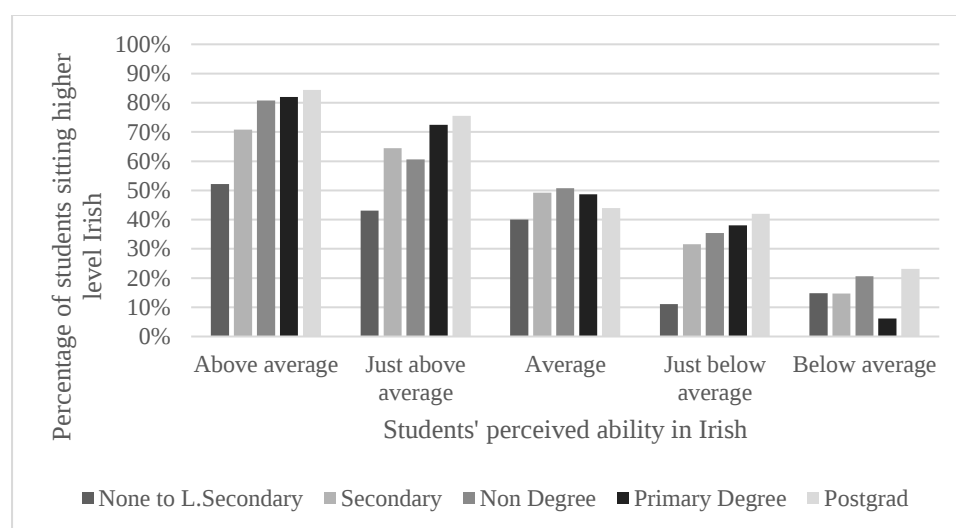
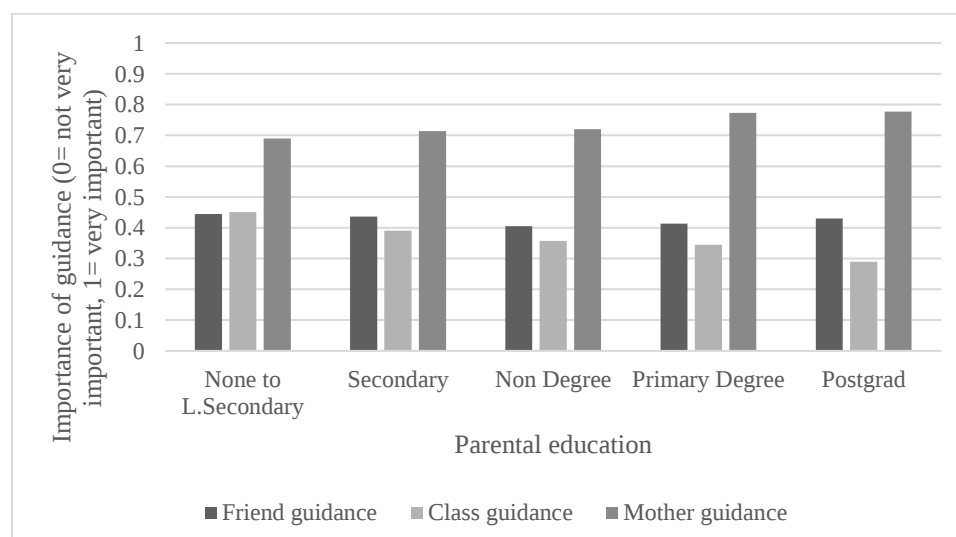


Figure 5. 7: Percentage of students sitting higher level Irish, by parental education and self-perceived ability in Irish relative to peers. Note: Data weighted and imputed.



We further anticipate that sources of information could also affect the effectiveness of student decision-making processes, including selection into higher-level subjects. Figure 5. 8 illustrates the importance of school, friend and parental guidance for students in deciding what they wanted to do post-school. While mothers' guidance is the most important form of guidance across all parental-education categories, its importance is greatest for students from higher-educated households, while the importance of school guidance largely follows the opposite gradient, with it being less important for students from higher-educated households than from lower-educated households.

Figure 5. 8: Children's reported importance of different sources of advice when deciding on post-secondary school options, by parental education. Note: Data weighted and imputed.



Multivariate models

Table 5. 2: Average marginal effects of selecting higher level maths.
Note: Using weighted and imputed data.

Variables	I		II		III	
	dy/dx	SE	dy/dx	SE	dy/dx	SE
Male	0.405***	(0.090)	0.637***	(0.122)	0.719***	(0.123)
Parent education (baseline <i>Low secondary</i>)						
<i>High secondary</i>	0.695***	(0.158)	0.141	(0.205)	0.069	(0.208)
<i>Non degree</i>	1.142***	(0.173)	0.391*	(0.234)	0.202	(0.238)
<i>Primary degree</i>	1.628***	(0.184)	0.753***	(0.243)	0.602**	(0.248)
<i>Postgrad</i>	1.910***	(0.201)	0.732***	(0.250)	0.561**	(0.260)
Behavioural difficulties			-0.272	(0.668)	-0.206	(0.640)
Chronic illness			0.022	(0.221)	-0.009	(0.222)
BAS Matrices			0.011***	(0.004)	0.011***	(0.004)
JC maths performance			0.090***	(0.005)	0.092***	(0.005)
DEIS School					-0.468**	(0.218)
Peer maths performance (baseline <i>Below average</i>)						
<i>Above average</i>					-0.503	(0.377)
<i>Just above average</i>					-0.487	(0.360)
<i>Average</i>					-0.632*	(0.353)
<i>Just below average</i>					0.108	(0.371)
Parent expects child will attend HE					0.609*	(0.362)
Child took grinds					0.307**	(0.124)
Importance of class guidance (baseline <i>Very important</i>)						
<i>Important</i>					0.108	(0.183)
<i>Not very important</i>					0.258	(0.175)
Important of friends' guidance (baseline <i>Very important</i>)						
<i>Important</i>					0.070	(0.174)
<i>Not very important</i>					0.102	(0.183)
Importance of mother's guidance (baseline <i>Very important</i>)						
<i>Important</i>					0.068	(0.135)
<i>Not very important</i>					-0.144	(0.200)
Observations	3,889		3,889		3,889	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5. 3: Average marginal effects of selecting higher level English.
Note: Using weighted and imputed data.

	I		II		III	
Variables	dy/dx	SE	dy/dx	SE	dy/dx	SE
Male	-0.416***	(0.142)	-0.182	(0.175)	-0.189	(0.186)
Parent education (baseline						
<i>Low secondary</i>)						
<i>High secondary</i>	0.799***	(0.183)	0.589**	(0.236)	0.583**	(0.232)
<i>Non degree</i>	1.355***	(0.233)	0.834***	(0.274)	0.789***	(0.271)
<i>Primary degree</i>	1.349***	(0.263)	0.525	(0.350)	0.499	(0.326)
<i>Postgrad</i>	2.202***	(0.388)	1.066**	(0.440)	0.968**	(0.446)
Behavioural difficulties			-0.203	(0.609)	-0.237	(0.641)
Chronic illness			-0.577**	(0.261)	-0.505**	(0.253)
BAS Matrices			0.008*	(0.005)	0.008	(0.005)
JC English performance			0.102***	(0.007)	0.101***	(0.007)
DEIS School					-0.548**	(0.240)
Peer English performance						
(baseline <i>Below average</i>)						
<i>Above average</i>					0.203	(0.573)
<i>Just above average</i>					0.926	(0.569)
<i>Average</i>					1.083*	(0.566)
<i>Just below average</i>					1.033*	(0.626)
Parent expects child will						
attend HE					0.766**	(0.334)
Child took grinds					-0.167	(0.170)
Importance of class						
guidance (baseline <i>Very</i>						
<i>important</i>)						
<i>Important</i>					0.057	(0.245)
<i>Not very important</i>					0.041	(0.237)
Important of friends'						
guidance (baseline <i>Very</i>						
<i>important</i>)						
<i>Important</i>					-0.305	(0.239)
<i>Not very important</i>					-0.368	(0.244)
Importance of mother's						
guidance (baseline <i>Very</i>						
<i>important</i>)						
<i>Important</i>					0.147	(0.199)
<i>Not very important</i>					0.198	(0.270)
Observations	3,922		3,922		3,922	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5. 4: Average marginal effects of selecting higher level Irish.
Note: Using weighted and imputed data

	I		II		III	
Variables	dy/dx	SE	dy/dx	SE	dy/dx	SE
Male	-0.655***	(0.094)	-0.377***	(0.134)	-0.312**	(0.137)
Parent education (baseline <i>Low secondary</i>)						
<i>High secondary</i>	0.711***	(0.159)	0.291	(0.214)	0.272	(0.217)
<i>Non degree</i>	0.954***	(0.176)	0.374	(0.235)	0.343	(0.240)
<i>Primary degree</i>	0.945***	(0.185)	-0.042	(0.264)	-0.081	(0.263)
<i>Postgrad</i>	1.195***	(0.223)	-0.203	(0.336)	-0.203	(0.334)
Behavioural difficulties			0.020	(0.552)	0.069	(0.548)
Chronic illness			-0.380*	(0.207)	-0.373*	(0.206)
BAS Matrices			-0.005	(0.004)	-0.005	(0.004)
JC Irish performance			0.102***	(0.005)	0.101***	(0.005)
DEIS School					0.013	(0.222)
Peer Irish performance (baseline <i>Below average</i>)						
<i>Above average</i>					0.839**	(0.420)
<i>Just above average</i>					1.035**	(0.406)
<i>Average</i>					0.879**	(0.406)
<i>Just below average</i>					0.652	(0.443)
Parent expects child will attend HE					0.292	(0.344)
Child took grinds					0.105	(0.137)
Importance of class guidance (baseline <i>Very important</i>)						
<i>Important</i>					-0.087	(0.174)
<i>Not very important</i>					-0.280	(0.177)
Important of friends' guidance (baseline <i>Very important</i>)						
<i>Important</i>					0.093	(0.172)
<i>Not very important</i>					0.306*	(0.183)
Importance of mother's guidance (baseline <i>Very important</i>)						
<i>Important</i>					-0.292*	(0.153)
<i>Not very important</i>					-0.524**	(0.232)
Observations	3,882		3,882		3,882	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Tables 5. 2, 5. 3 and 5. 4 provide the average marginal effects for models predicting selection of higher-level mathematics, English and Irish respectively.

Model 1 provides the baseline model, showing the total effect of parental education adjusting only for student sex. Differences by sex are observed in all subject-level models, with being male increasing selection into higher-level mathematics by 40 percentage

points (pp) relative to girls, while being female increases selection into higher-level English and Irish by 42 pp and 66 pp respectively. Differences by parental education are likewise observed in selection of higher-level subject level for mathematics, English and Irish, with average marginal effects of selecting higher level increasing hierarchically by parental education.

Model 2 adjusts for behavioural difficulties and chronic illness, as well as ability as measured through BAS matrices and prior performance in the outcome subject in Junior Certificate examinations. Higher prior performance in the subject is associated with taking higher level in that subject, while higher ability scores are also associated with taking higher level maths and English. Adjusting for prior performance and ability makes all class differences in the take up of higher level Irish statistically insignificant relative to the *Low secondary* baseline; however, class differences remain for both maths and English even after prior performance and ability is accounted for, albeit substantially smaller than in model 1.

Contextual factors, such as access to information and the ability to effectively utilise that information, is hypothesised to affect decision-making processes. However, an RRA hypothesis would anticipate that differences by socio-economic background will continue to manifest themselves even after adjusting for such contextual factors, as students' underlying motivations remain tied to social background. Despite the addition of contextual factors such as perceived ability and sources of advice in model 3, most parental education differences observed in the previous models remain in both mathematics and English, with only small decreases in the average marginal effects relative to model 2. In mathematics, having *graduate degree* or *postgraduate* educated parents increases selection into higher-level mathematics by 60 and 56 percentage points respectively relative to having *lower secondary* educated parents, while having *high*

secondary, non-degree and *postgraduate* educated parents increases selection into higher-level English by 58, 79 and 97 percentage points respectively. No differences by parental education are observed in higher-level Irish.

Interaction with ability

Hypothesis 3 asserts that the differential between students of different social backgrounds is negatively associated with ability: that is, the gap should be widest at the lower end of the ability distribution, and smallest between higher-ability students. To test whether this is the case, we fit two interactions separately: first between ability (measured through BAS Matrices) and parental education, and second between academic performance (JC subject result) and parental education, adjusting for all variables included in model 3. Marginal effects at representative values are graphed in Figures 5. 9, 5. 10 and 5. 11. The representative values selected are a standard deviation above and below the mean, half a standard above and below the mean, and the mean of BAS matrices (SD=17), JC mathematics performance (SD=30), JC English performance (SD=16) and JC Irish performance variables (SD=22), with standard deviations obtained from Table 1. Table 5. 6 in the Appendix includes the marginal effects at representative values with their respective standard errors.

For mathematics, the interaction is in the expected direction, with parental education differences present at lower ability levels, and narrowing as ability increased. Relative to the *Lower secondary* baseline, statistically significant differences are observed for students from *Non-degree* and *Primary degree* households at ability levels (BAS matrices) a standard deviation below and half a standard deviation below the mean, and for students from *Postgraduate* households half a standard deviation below the mean, at the mean, and half a standard deviation above mean. In line with our expectation that these gaps would

be smaller at higher performance levels, no statistically significant differences are observed by parental education when student performance is one standard deviation above mean. Using JC mathematics performance as the ability measure, students from *Primary degree* households are more likely to select higher level mathematics than students from *Lower secondary* households when performing a standard deviation below, half a standard deviation below, at the mean and half a standard deviation above the mean in JC mathematics. However, no statistically significant differences are observed for the other parental education categories relative to the *Lower secondary* baseline at any JC mathematics performance level.

Differences by parental education are observed at lower ability levels in the selection of higher-level English, with students from *Higher secondary*, *Non degree* and *Postgraduate degree* parental-educated households selecting to sit English at higher level at a statistically significantly higher rate relative to the *Lower secondary* baseline, at lower and average levels of ability (as measured by BAS matrices). No statistically significant differences by parental education were present at ability levels above the mean. When interacting parental education with performance in JC English, similar patterns are observed, with students from *High secondary*, *Non-degree* and *Primary degree* who performed one standard deviation below the mean in JC English selecting to study higher-level English at a statistically significantly higher level than students from *Lower secondary* with the same performance, with no statistically significant differences

observed between parental education categories and the baseline at mean JC English performance or above.

In contrast to mathematics and English, no statistically significant differences in selection of higher level Irish were observed by parental education category at any ability level, either when ability was measured via BAS matrices or via JC Irish performance.

Figure 5. 9: Marginal effects at representative values of parental education on selection of higher level maths by BAS matrices and JC maths performance (baseline: Low secondary).

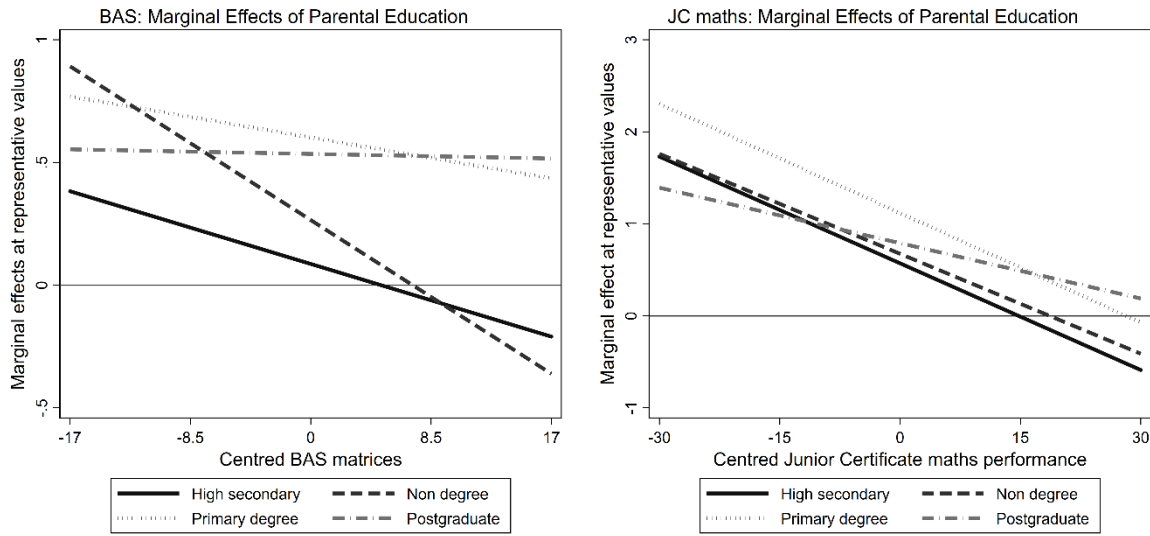


Figure 5. 10: Marginal effects at representative values of parental education on selection of higher level English by BAS matrices and JC English performance (baseline: Low secondary).

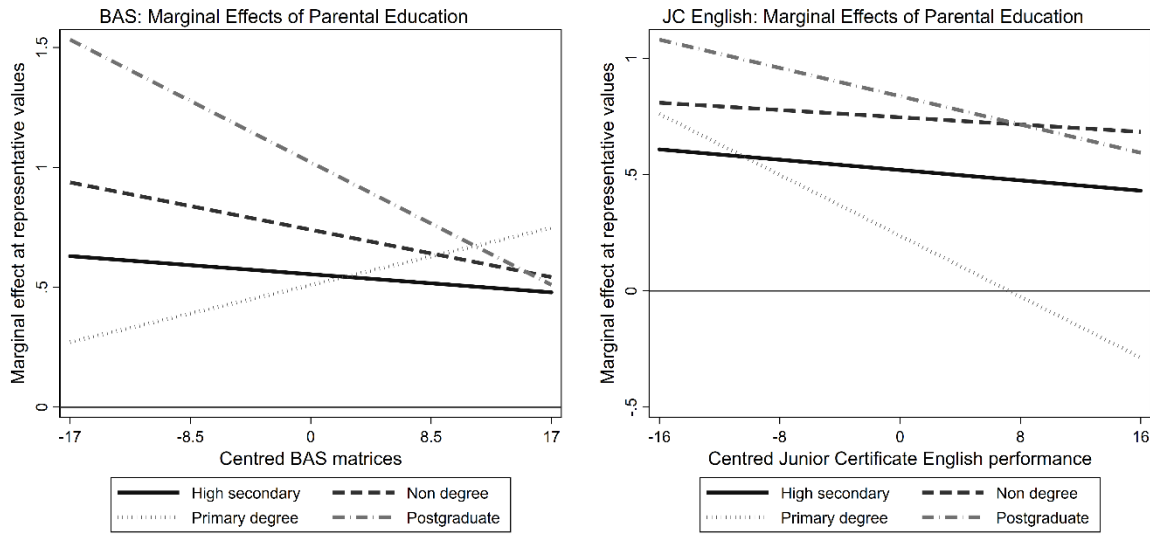
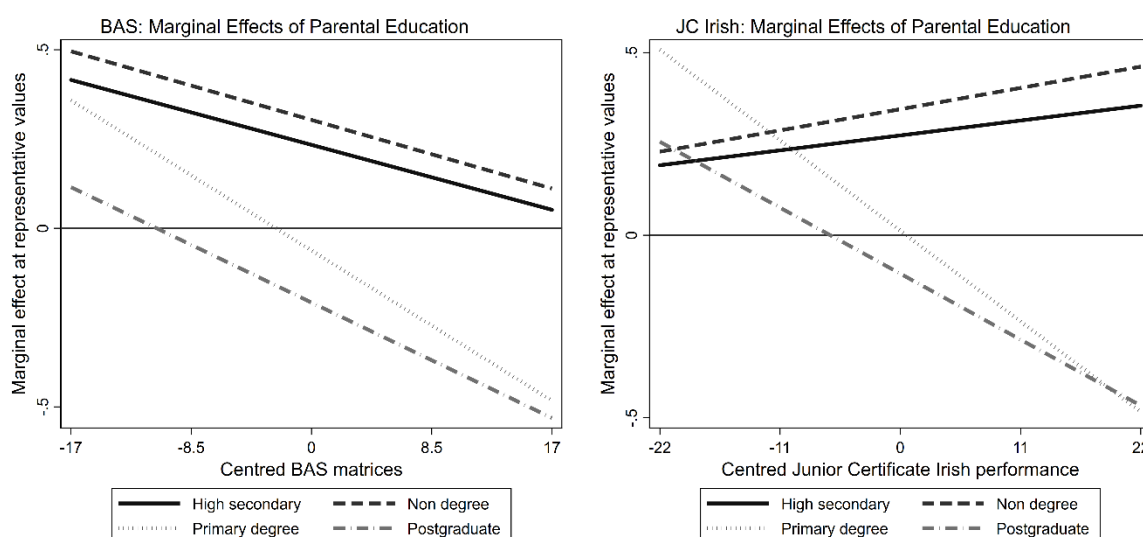


Figure 5. 11: Marginal effects at representative values of parental education on selection of higher level Irish by BAS matrices and JC Irish performance (baseline: Low secondary).



Discussion

A large body of social science research has attempted to understand secondary effects of social origin, and in particular why students from lower socio-economic backgrounds select into higher education at much lower rates than their more socio-economically advantaged peers. However, much of this research has addressed selection into higher education as the outcome of a rational decision-making process reflecting ambition, risk-aversion and time discounting preferences. Decision-making processes themselves have received less attention, and we know comparatively little about how choices taken by students who share the same goal (e.g. higher education) come about and why these decisions vary by socio-economic background.

Using representative data on students in the Irish secondary education system, in this article we sought to explore how students who aspired to attend higher education made different subject-level choices that could affect their ability to realise those goals, net of cognitive ability and prior performance. Ireland provided a particularly useful case for examining differences in student decision-making processes, given the scope for students

to make choices that meaningfully affect their opportunities of progressing to higher education is limited owing to the largely standardised secondary education system, with subject level effectively the only academic choice open to students that could affect their chances of attending higher education, net of primary effects.

Descriptive statistics highlighted socio-economic differences in cognitive ability and academic performance among students aspiring to attend higher education. Differences were also observed in how students evaluated their own performance, with students whose parents had lower-education attainment overestimating their perceived ability relative to their actual performance, and students with higher-educated parents underestimating their perceived ability. Despite reporting that their ability was higher than average, students with lower-educated parents were still more likely to select into easier, but less-rewarding ordinary subject-level options net of prior performance in that subject, while their peers with higher-educated parents opted for the more-difficult, but better-rewarding higher level options at the same performance level.

Our multivariate models adjusted for potential confounders. Substantial differences by parental education for both higher-level mathematics and English continued to be observed, with students from higher parental-education households more likely to select into higher level than their peers, *ceteris paribus*. Contrary to our hypothesis that these differences in subject-level selection would be viewed across all subject levels, selection of higher-level Irish was not predicted by parental education.

A bounded rationality approach hypothesises that decision-making processes will be influenced by the social context in which they are being made. However, these differences should not be expected to fully disappear in an RRA model even after adjusting for contextual factors, as the motivation behind decision-making (i.e. avoiding social class

demotion) remains stable. We hypothesised that by accounting for contextual differences, some but not all the socio-economic differentials observed in Model 1 would be explained. Descriptive statistics indicated that, while the majority of students relied on their mother's advice in deciding what to do after school, the reliance on in-school guidance students was greater among students with lower-educated parents relative to students with higher-educated parents, while students with higher-educated parents relied more heavily on parental guidance than their peers with lower-educated parents. Even after adjusting for contextual limitations such as the sources and importance of advice, and including student self-perceived ability as a proxy for the educational environment in which students were making decisions, parental-education effects remained stable.

Lastly, we argued that students from lower socio-economic backgrounds would be more inclined to select options that minimised the risk of failure unless their ability mitigated the risk, while higher socio-economic peers would select riskier but better-rewarding choices irrespective of ability, as ambitious choices were required to avert downward social mobility. As such, we anticipated that the differences in selection of higher level would be greatest at the lower end of the ability and prior performance distribution, as lower-SEP students hedged their risks by choosing ordinary level, while higher-SEP students were obliged to take subjects at higher level – increasing the risk of failure, but also raising the reward. Interacting parental education with ability and prior performance supports this hypothesis, with differences by parental education in selection of higher level subjects greatest at the lower ability and performance distributions for both maths and English. Furthermore, differences were not statistically significant at higher ability levels as anticipated. However, no differences by parental education were observed in the take up of higher level Irish.

Our results indicate that, in line with the Relative Risk Aversion hypothesis, social background differences in student decision-making remain net of ability and performance, with students from higher socio-economic backgrounds more likely to select the ambitious higher-level options even after accounting for contextual factors and confounders. Furthermore, our expectation that ability and prior performance would more readily determine lower socio-economic students' selection into higher level but not be associated with higher socio-economic students' selection into higher level has some support, with the interaction of ability and prior performance by parental education in the selection of higher level mathematics and English indicating that parental education gaps narrow as prior performance and ability increase.

The results further indicate that contextual factors could influence the decision-making efficacy of students. Descriptive statistics show that lower socio-economic students are more likely to overestimate their ability, and to select lower-levels in subjects relative to their more socio-economically advantaged peers. In our multivariate models, unlike objective performance indicators like Junior Certificate results, subjective evaluation of performance did not predict selection of higher level in that subject, perhaps indicating that students were comparing themselves to their peers within the school as opposed to accurately estimating their ability relative to the general student population. With students nested in schools, students in a low-performing school could conceptually evaluate high performance at ordinary level as a sufficiently high standard of performance to enable entry into higher education if their peers in that school performed at the same level or worse than them. In contrast, for students in schools where performance levels are higher, students may evaluate their performance more strictly in relation to high-performing peers, and thereby push themselves to select higher level in subjects as the only perceived means by which to enable entry into higher education.

Study Limitations

Our analysis faced several limitations that need to be acknowledged when interpreting results. While our models sought to test the validity of Relative Risk Aversion in explaining the selection of higher level by students, our results do not fully confirm whether we observe a pattern of risk aversion, or whether it is merely a reflection of poor decision-making by students. While a rational maximisation of points acquired would indicate a student should take a subject at higher level, risk aversion mechanisms might still be at play. For instance, students might be motivated to attend higher education, but choose less-ambitious higher education options that have more-accessible entry requirements. With lower entry requirements, students may become more intent on avoiding failure in a subject as opposed to maximising the points acquisition. It is conceivable that students from lower socio-economic backgrounds aspire to pursue higher education in institutions where entry requirements are lower, thereby reducing the competitive entry requirements and the need to take more ambitious level choices. In contrast, higher socio-economic students might aspire to study in more prestigious institutions of higher education, the competitiveness of which oblige them to take more ambitious choices to maximise their chances of gaining entry.

Our models sought to account for environmental limitations, such as access to suitable information, by incorporating measures of guidance and their importance to students in terms of decision-making in our models. However, these measures do not adjust for the nature of the advice given or its effectiveness, the variation of which could be missed by our model specifications. Furthermore, it could be anticipated that variation in quality of the guidance could correlate with other explanatory variables, thereby potentially biasing their estimation.

Lastly our models, while attempting to account for contextual factors such as advice and self-evaluated ability, cannot account for factors such as the school context in which decisions are being made, and the effect school actors can have on student decision-making. Some schools may place increased pressure on children to pursue higher level, while others might encourage students to move to ordinary level. While it might be anticipated that a student is making a decision on the basis of self-evaluation and advice, it could be that these decisions are taken or at least strongly influenced by school processes. While a multilevel model design could account for school-contextual factors, our data was not suited to such a model design, with many schools having too few students in them to allow for a nested design.

In spite of these limitations, our conclusions indicate that net of ability, prior performance, aspirations and contextual factors, lower socio-economic students make less ambitious subject-level choices that risk undermining the opportunity to attain their goal of entering higher education. Future studies would benefit from testing student decision-making processes using multilevel models that can adequately account for school-level effects.

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Appendix

Table 5. 5: Leaving Certificate points scheme.

Grade	H. Level mathematics	Higher Level	Ordinary Level	Foundation Level*
A1	125	100	60	20
A2	115	90	50	15
B1	110	85	45	10
B2	105	80	40	5
B3	100	75	35	0
C1	95	70	30	0
C2	90	65	25	0
C3	85	60	20	0
D1	80	55	15	0
D2	75	50	10	0
D3	70	45	5	0

*Note: Only available for mathematics and Irish

Table 5. 6: Marginal effects at representative values of selection of higher level mathematics: interaction between parental education (baseline: none and lower secondary) and BAS matrices, and between parental education (baseline: none and lower secondary) and JC mathematics performance. Note: Data weighted and imputed.

	Higher secondary		Non degree		Primary degree		Postgraduate	
	dy/dx	SE	dy/dx	SE	dy/dx	SE	dy/dx	SE
BAS matrices								
1 SD below mean	0.383	(0.358)	0.892**	(0.394)	0.769*	(0.462)	0.554	(0.424)
0.5 SD below mean	0.235	(0.269)	0.578*	(0.300)	0.685**	(0.344)	0.544*	(0.320)
Mean	0.087	(0.217)	0.265	(0.244)	0.602**	(0.263)	0.535**	(0.268)
0.5 SD above mean	-0.062	(0.229)	-0.048	(0.252)	0.518**	(0.257)	0.526*	(0.295)
1 SD above mean	-0.210	(0.298)	-0.361	(0.321)	0.434	(0.330)	0.516	(0.385)
JC mathematics performance								
1 SD below mean	1.731	(1.056)	1.760	(1.130)	2.305**	(1.157)	1.392	(1.308)
0.5 SD below mean	1.151	(0.713)	1.217	(0.762)	1.711**	(0.782)	1.091	(0.903)
Mean	0.571	(0.394)	0.674	(0.423)	1.117**	(0.436)	0.790	(0.525)
0.5 SD above mean	-0.009	(0.242)	0.131	(0.268)	0.523*	(0.276)	0.489	(0.299)
1 SD above mean	-0.589	(0.467)	-0.412	(0.509)	-0.071	(0.519)	0.188	(0.507)

N=3,889; Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Note: Lower secondary education is the baseline category

Table 7: Marginal effects at representative values of selection of higher level English: interaction between parental education (baseline: none and lower secondary) and BAS matrices, and between parental education (baseline: none and lower secondary) and JC English performance. Note: Data weighted and imputed.

	Higher secondary		Non degree		Primary degree		Postgraduate	
	dy/dx	SE	dy/dx	SE	dy/dx	SE	dy/dx	SE
BAS matrices								
1 SD below mean	0.630**	(0.289)	0.937***	(0.344)	0.271	(0.467)	1.533**	(0.667)
0.5 SD below mean	0.592**	(0.237)	0.839***	(0.281)	0.390	(0.362)	1.277**	(0.562)
Mean	0.554**	(0.248)	0.740***	(0.282)	0.510	(0.339)	1.021**	(0.495)
0.5 SD above mean	0.517	(0.314)	0.641*	(0.346)	0.629	(0.411)	0.766	(0.482)
1 SD above mean	0.479	(0.411)	0.542	(0.447)	0.748	(0.542)	0.510	(0.526)
JC English performance								
1 SD below mean	0.609**	(0.248)	0.809***	(0.295)	0.761**	(0.336)	1.080	(0.660)
0.5 SD below mean	0.564**	(0.264)	0.778**	(0.303)	0.499	(0.320)	0.959*	(0.502)
Mean	0.520	(0.361)	0.747*	(0.429)	0.237	(0.415)	0.837*	(0.472)
0.5 SD above mean	0.475	(0.492)	0.715	(0.602)	-0.025	(0.568)	0.716	(0.591)
1 SD above mean	0.431	(0.638)	0.684	(0.792)	-0.287	(0.744)	0.594	(0.793)

N=3,922; Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Note: Lower secondary education is the baseline category

Table 8: Marginal effects at representative values of selection of higher level Irish: interaction between parental education (baseline: none and lower secondary) and BAS matrices, and between parental education (baseline: none and lower secondary) and JC Irish performance. Note: Data weighted and imputed.

	Higher secondary		Non degree		Primary degree		Postgraduate	
	dy/dx	SE	dy/dx	SE	dy/dx	SE	dy/dx	SE
BAS matrices								
1 SD below mean	0.416	(0.280)	0.496	(0.316)	0.359	(0.377)	0.115	(0.512)
0.5 SD below mean	0.325	(0.230)	0.400	(0.258)	0.148	(0.300)	-0.047	(0.395)
Mean	0.234	(0.225)	0.304	(0.245)	-0.062	(0.270)	-0.208	(0.340)
0.5 SD above mean	0.143	(0.269)	0.207	(0.284)	-0.273	(0.300)	-0.370	(0.374)
1 SD above mean	0.052	(0.343)	0.111	(0.358)	-0.483	(0.376)	-0.531	(0.479)
JC mathematics performance								
1 SD below mean	0.192	(0.380)	0.229	(0.422)	0.508	(0.410)	0.256	(0.544)
0.5 SD below mean	0.233	(0.256)	0.287	(0.293)	0.260	(0.288)	0.075	(0.392)
Mean	0.273	(0.227)	0.345	(0.249)	0.012	(0.252)	-0.105	(0.320)
0.5 SD above mean	0.314	(0.319)	0.403	(0.327)	-0.236	(0.330)	-0.286	(0.376)
1 SD above mean	0.355	(0.466)	0.462	(0.470)	-0.484	(0.469)	-0.466	(0.520)

N=3,882; Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Note: Lower secondary education is the baseline category

Discussion and conclusion

This final chapter discusses the findings and conclusions of the thesis in three sections.

First, we provide a synopsis of each of the studies, touching on the key theoretical approaches that informed the studies, and the findings garnered from the analyses. Second, we position each study within the wider context of educational inequalities literature, highlighting how it relates to existing research, the contributions it makes to the field, and the limitations it holds. Lastly, we identify further avenues for future research that can expand upon the work presented in this thesis.

Overview of studies

Understanding how socio-economic background translates into inequalities in educational performance and decision-making requires the consideration of an array of individual and social factors that can play a role in determining outcomes. This thesis attempts to contribute to the body of research on socio-economic inequalities in education by synthesising theoretical work from an range of academic disciplines and testing them using longitudinal data from an Irish cohort study in four studies.

Studies I and II contribute to our understanding of why students from lower socio-economic backgrounds perform worse, on average, than their higher socio-economic peers (primary effects). Previous research has shown that lower socio-economic students have worse conduct in school than their more advantaged peers, thus Study I analyses the socio-economic patterning of student disaffection with education and explores one theory about the origins of these differentials. Study II explores a second theory about the origins of these differentials in disaffection: household exposure to financial strain and the effects this has on family processes and the development of behavioural difficulties among children, an outcome that is associated with worse academic performance. Study III

explores whether schools play a role in moderating the primary effects of family background on student performance in education by disentangling the effects of school type, disciplinary practices and ethos on academic performance from the individual characteristics of the students. Lastly, Study IV addresses the secondary effects of social origin by exploring socio-economic differences in student curricular selections that affect students' chances of progressing to higher education, controlling for the aspirations of the students, their prior performance and their cognitive ability.

Study I: When and why do socio-economic differences in student conduct emerge? A longitudinal study from age 9 to 17/18

Study I attempts to address the question of why students from lower socio-economic backgrounds are more likely to display worse behavioural conduct than their more socio-economically advantaged peers. It has been recognised for decades that student disaffection with schooling is a major contributor to educational inequalities as it is more likely to occur among students from lower social and economic positions (SEP). The research literature from educational psychology has understandably focused on the individual, psychological processes that lead to the development of disaffection, such as amotivation and low student self-esteem. However, this research fails to account for why certain groups will more readily develop disaffection; there has yet to be a compelling longitudinal test of social group differences. Conversely, sociological and anthropological approaches have often sought to explain the development of socio-economic differences in disaffection as the product of a subcultural rejection or disconnect with educational values among lower-SEP students. Yet such explanations largely ignore the importance of psychological considerations by attempting to explain observed phenomena through an exclusively cultural lens, while also failing to account for the high value afforded to education by the majority of lower-SEP families.

In this study, we test an alternative, hybrid model where SEP-differences in resources and parenting practices dampen student performance among working-class students, reducing student self-esteem, leading to worse behavioural conduct (our measure for externalised disaffection) among students. We test this theory using a hybrid model analysis of longitudinal data from Cohort98 of the Growing Up in Ireland study (N = 6039; 51.2% female; ages 9-17). Fixed effects models hold an advantage over random effects models because they control for all time-invariant variables (level 2 ‘between’ effects) that might bias the estimation of time-variant variables (level 1 ‘within’ effects). This is of particular importance if the level 2 individual-specific effect is correlated with the level 1 independent variables being estimated, as unexplained variance at the second level could be correlated with the level 1 regressors (the ‘random effects assumption’), leading to inaccurate estimation (Antonakis, Bastardo, and Rönkkö 2021). However, this approach has the drawback that coefficients for the effects of time-invariant variables of interest cannot be estimated. In order to accurately estimate level 1 variables while also accounting for how this is associated with level 2 variables of interest (such as household class), hybrid models were used, which allow for the estimation of both time-variant and time-invariant variables through the inclusion of level 1 cluster means – the addition of which accounts for any correlation between the unexplained level 2 error, and the level 1 regressors. Such an approach enables us to measure whether class differences in child conduct (our outcome variable) are reduced, once academic performance and self-esteem are adjusted for.

Results for our hybrid model is mixed. Class differential in conduct are accounted for after adjusting for maths performance and self-esteem, while decreasing self-esteem is also associated with an increase in conduct difficulties. However, declining maths performance has no statistically significant effect on conduct, indicating that the observed association

between self-esteem and conduct is not as a result of academic performance, as hypothesised. Furthermore, while there is a statistically significant association between declining self-esteem and increasing conduct difficulties, the size of the effect is very small, with a standard deviation increase in self-esteem only associated with between 3.8% and 4.5% decline in conduct difficulties. In our conclusions, we discuss the possible reasons as to why performance has no effect on conduct, and why self-esteem has a small, statistically significant effect. Alternative theoretical explanations and avenues for future research are discussed.

Study II: A fixed effects analysis of the effect of financial strain and parental depression on child behavioural difficulties during the Great Recession in Ireland

While Study I explores whether student self-esteem and academic performance explain socio-economic differentials in student behavioural disaffection, Study II shifts attention to exploring whether student behavioural difficulties (a predictor of poor educational outcomes and correlated with socio-economic background) reflect household exposure to financial strain and its effect on family processes.

Research has long identified class differences in the development of child behavioural difficulties, with two main sociological theories put forward to explain them. Subcultural approaches argue that class inequalities largely reflect differences in parenting styles, values and aspirations. By contrast, resource-based explanations focus on the role of socio-economic differences in shaping family processes which in turn can influence the development of child and adolescent behavioural difficulties. Adjudicating between competing subcultural and resource-based explanations has been problematic because of the difficulty in separating causal mechanisms from pre-existing risk factors. Even in studies that have adopted longitudinal approaches to testing resource-based explanations,

identifying causal effects has been difficult owing to the stability of measures within families during periods of economic stability. The Great Recession in Ireland provides an opportunity to test the resource-based explanation as it was a period of severe economic contraction that led to a sudden change in financial strain among families, including well-educated and high-income families. The recession thus provides an interesting opportunity to measure the effect of within-family change in economic strain on child behavioural difficulties.

The study uses hybrid (between-within) models, a hybrid of fixed and random effects estimators, to disentangle the effects of financial strain from existing class differences in determining child behavioural difficulties. The analysis is conducted using longitudinal data from Cohort98 of the Growing Up in Ireland study (N = 6,039; 51.2% female; ages 9-17) collected before, during and after the Great Recession in Ireland. Our findings provide support for a resource-based explanation of class differences in child behavioural difficulties, with the inclusion of subjective financial strain and parental depression accounting for a large proportion of the initial class effect in externalised behaviour, while also making class effects in internalised behaviour statistically insignificant for most groups. The discussion considers the implications of the findings and avenues for future research.

Study III: The effect of school type and ethos on student learning outcomes

Study III explores whether school attributes, such as socio-economic composition, disciplinary practices and ethos (i.e. teacher-student relations) moderate the primary effects of social origin. This paper attempts to contribute to the literature addressing the classic social science question of ‘do schools matter’. Some very clear examples of how schools matter have been seen, with education systems that employ school tracking

providing a strong example of how differences between school can determine academic outcomes of students, net of the students' background characteristics. However, school effects have also been observed in other, less obvious ways. Different schools have varying average levels of student performance, and between-school differences in performance strongly reflect the socio-economic composition of the students attending the school. Furthermore, school composition may also be correlated with other differences between schools such as school resources, quality of teaching and ethos. However, quasi-experimental research has shown that where lower-SEP students have been randomly assigned to higher or lower-SEP composition schools, those who attended higher-SEP composition schools outperformed their peers in lower-SEP composition schools.

Such randomised assignment of students to different school types and compositions is the optimum way by which the effect of schools on student performance can be disentangled from the characteristics of the students who attend them. However, practical and ethical considerations make this unfeasible in most cases. In this study, we overcome these obstacles by using propensity score stratifying techniques in a three-stage analytical approach. First, primary school students' propensity to select into DEIS (schools catering for socio-economically disadvantaged communities) secondary schools using regression techniques and the resulting propensity score is stratified into ten strata (or 'bins' as they are often referred to). Second, we estimate the effect of attending a DEIS school on educational achievement using fixed effects models within each stratum, thus adjusting for between-strata differences and enabling the accurate estimation of the effect of DEIS schools on student academic performance within each stratum. Third, we then test whether the effect of attending a DEIS school on child educational performance can be accounted for by school-level variation in the proportion of young people with emotional and behavioural conditions, school disciplinary practices and the school ethos. Analyses are

conducted using data from Cohort98 of Growing Up in Ireland (N = 5336; 51% female; ages 9-17).

Our results show that attending a DEIS school is statistically significantly and negatively associated with child educational performance at age 15 adjusting for family SEP and the selection process into secondary school. However, whilst we find that school disciplinary practices do not independently affect student exam performance at 15, both DEIS status and the ethos of the school have statistically significant and independent effects on student performance.

Study IV: Constrained by Choice: Social Class and Subject-Level Selection in the Irish Secondary Education System

The three previous studies explore the manifestation of primary effects, either directly in the case of student performance in Study III or indirectly through the development of student disaffection (Study I) and behavioural difficulties (Study II) that mediate poor educational performance. Study IV explores the manifestation of secondary effects: namely how students' educational decisions are taken along socio-economic lines, given the options their previous performance leaves open to them. Most papers analysing secondary effects focus predominantly on branching points in education, such as the socio-economic differences in student selection into certain tracks of education (e.g. vocationally-tracked secondary education vs academically-tracked secondary education) and whether students opt to continue in education past compulsory levels or select out of education at the earliest opportunity. However, less research has sought to understand why students who have the same educational goals (e.g. entry into higher education) make different choices that can affect their prospects of realising these goals, net of prior performance and ability, and how this may be influenced by the child's SEP. The Relative

Risk Aversion hypothesis holds that students and their families seek first and foremost to maintain their current class position with the consequence that higher-SEP students will, *ceteris paribus*, choose more risky choices if they are required for entry into the family class location.

We operationalise the Relative Risk Aversion hypothesis using data from Wave 3 of Cohort98 of Growing Up in Ireland conditioned on whether the student intended to attend higher education (N = 4,981; 52% female, age 17/18) to test whether socio-economic differentials in student subject-level selection reflect differences in students' risk aversion. Unlike the previous three studies, Study IV adopts a predominantly cross-sectional analytical approach, exploring socio-economic differentials in curricular decision-making among students who aspire to attend higher education. While models do control for prior ability, as measured in Wave 2, the analysis adjusts for contemporaneous variables (Wave 3) when examining curricula choices using logistic regression.

Our results indicate that while student ambition to attend higher education was high across different socio-economic groups, higher-SEP students took more ambitious and more rewarding choices, even after controlling for previous performance and ability, relative to their lower-SEP peers with the same ambition to attend third-level education. This finding could suggest the operation of relative risk aversion, since students of similar ability but different SEP background vary in terms of their likelihood to choose more testing curricula options. Furthermore, in line with an operation of relative risk aversion, there is some support for our hypothesis that SEP differentials would narrow as academic ability increased, with SEP differences in selection higher level mathematics and English observed to be at their largest at the lower end of the ability distribution.

Conclusion

A wealth of social science literature has documented the existence of socio-economic inequalities in educational performance and outcomes. Lower-SEP students perform, on average, worse in education relative to their higher-SEP peers. While policy approaches and interventions have understandably focused on reducing inequalities in performance in the expectation that this will reduce inequalities in outcomes, educational trajectories differ even when accounting for prior performance, with student decision-making also reflecting socio-economic background. As such, a comprehensive understanding of how inequalities develop and manifest themselves needs to account for differences in both performance and decision-making.

This thesis contributes to the existing literature on socio-economic inequalities in education by examining the development of inequalities in performance and decision-making, using longitudinal population-representative data from Ireland. To do this, the papers approached the topic holistically, exploring how individual-level processes and psychological mechanisms interact with social factors, and how variables correlated with SEP contributed to the manifestation of SEP inequalities.

Our results indicate that, despite increasing educational attainment across socio-economic groups, inequalities remain in a variety of educational measures including performance and decision-making. Furthermore, these differences remain even after adjusting for cognitive ability and aspirations, indicating that SEP inequalities reflect more than ability and ambition; they also interact with other contextual factors which may operate at the household and school level. Our empirical multivariate analyses also show that no single factor can comprehensively explain the association between socio-economic background and educational outcomes. Rather, our studies indicate that multiple processes overlap and interact with each other in the development of educational inequalities.

Results from Study I, for instance, show an association between academic performance and self-esteem. At each age, lower-SEP students have significantly lower self-esteem and worse academic performance than their higher-SEP peers, but our analyses sought to examine whether there was a ‘within-person’ association between worsening academic performance, lower self-esteem and worsening conduct. We found no association between declining performance in maths and worsening conduct, while the association between self-esteem and conduct was too small to singularly explain changes in conduct. If differences in academic performance and self-esteem do not explain SEP differentials in conduct, what other process could explain this pattern?

An alternative explanation for the preponderance of SEP differentials in student conduct could be that they reflect poor student-teacher relations, with such relations being worse in schools where there is a high proportion of lower-SEP students. Indeed, analysis in Study III found that more punitive disciplinary practices and less responsive ethe were disproportionately present in schools with a higher proportion of lower-SEP students. Advocates of a class subcultural perspective have argued that this reflects a disconnect between teachers’ values and those of their lower-SEP students, with student disengagement manifesting itself in poor conduct and behaviour. However, it could also be that the direction of the association flows in the opposite direction, with more punitive school disciplinary practices and less responsive school ethe emerging as a means of containing or managing worse student conduct difficulties in some schools. For instance, it could be that the conduct of lower-SEP students reflects the stressors they are exposed to in the home, the externalisation of which is reflected in behavioural difficulties in the classroom. Such an association was tested in Study II, which showed a linkage between home stressors (financial strain) and the development of child behavioural symptoms, with

increasing financial strain leading indirectly to increased behavioural difficulties in the child.

While theories such as those put forward by Kohn (1977) and Lareau (2003) suggest that socio-economic differences reflect differential values and patterns of socialisation, the mechanism of the Family Stress Model (FSM) tested in Study II indicates that they are instead likely to reflect the impact of financial strain on family processes and the psychological well-being of parents and their children. The Great Recession created variation in financial strain across socio-economic groups, allowing us to identify similar FSM processes across SEPs. However, even outside of periods of economic recession, lower-SEP families often experience financial strain and uncertainty, with the stress in turn being externalised onto other household members. The exposure to stressors in lower-SEP households and the causal effect it has on child behaviours suggests that it is the environment, not culture or personality, that accounts for the higher level of conduct difficulties among lower-SEP children.

Study III further highlights how contextual factors, such as school type, disciplinary practices and ethos, can influence the academic performance of students, net of their socio-economic background. While students from lower-SEP backgrounds are known to perform worse on average relative to their higher-SEP peers net of school characteristics, it may also be that school-level factors, such as school socio-economic composition, disciplinary practices and ethos (e.g. school expectations and guidance on the relationship between teachers and students), may moderate student performance once non-random student selection into schools is controlled for.

Our descriptive analyses showed that DEIS schools, a type of school that disproportionately caters for socio-economically disadvantaged communities, had a

significantly higher proportion of students with behavioural difficulties and, perhaps because of this, were more likely to employ disciplinary practices such as detention, suspension and exclusion. In addition, more challenging student composition was also associated with lower exam performance overall, whereas a more positive school ethos was associated with better student exam performance, on average.

However our central hypothesis – that the effect of DEIS school type on student exam performance would be accounted for by greater behavioural difficulties in the school body and more punitive disciplinary practices – did not hold. More punitive disciplinary processes were not significantly associated with performance in state examinations. Similarly, while school ethos had a largely positive and significant effect on student exam performance, this effect appeared to be independent of DEIS status.

The stability of DEIS school effects, even after adjusting for disciplinary practices, ethos, and selection, indicates that other underlying factors determine the school effects observed. One potential hypothesis could be that students are influenced by peers, with the aspirations and choices of peers affecting the performance of students in low-SEP composition schools who are capable of performing better. Alternatively, it could also be that school environment factors, such as teacher-led guidance of students to study subjects at higher or lower difficulty levels, could have an effect in determining student performance, with the level at which examinations are sat being reflected in our dependent-variable exam performance. Both hypotheses could be best tested using multilevel models whereby students are nested in schools, accounting for the different processes within schools. However, this unfortunately was beyond the remit of this study owing to the small number of students nested within particular schools.

Lastly, Study IV also found support for an interaction between individual aspirations and SEP differences in student decision-making. Differences in the decision-making of students who hold the same ambitions indicate that factors, such as student evaluation of risk and their ability to make effective decisions, are associated with their SEP. This suggests that differences in ambition do not fully explain the observed SEP-variation in decision-making as might be posited by cultural explanations. It also suggests that family-social position influences student decision-making, since once we adjust for student ability, past performance and differences across groups in guidance received, we still observe important differences in the extent to which students adopt the more ambitious educational tracks. What this shows is that social dimensions of groups and individual factors interact with each other in developing inequalities in student decision-making and outcomes.

Limitations

Our analyses have relied exclusively on data from Cohort98 of the Growing Up in Ireland Study. The longitudinal nature of the data, coupled with the rich child, parent and school information gathered, enabled us to assess the development and manifestation of socio-economic inequalities in education through a variety of theoretical and analytical approaches in a country context that has hitherto been under-researched. Importantly, the timing of data collection for the study coincided with a period of major economic and social instability in Ireland because of the ‘Great Recession’ which engulfed the country soon after the collection of the first wave of data in 2008. Whilst this had very serious consequences for the Irish economy, government and population, the Great Recession and the timing of data collection in the GUI project does provide a research opportunity since it creates variation in conditions and outcomes across the population, enabling us to

empirically test a variety of models and understand effects that are difficult to disentangle in more stable economic periods.

Despite these advantages, reliance on the GUI Cohort98 comes with some limitations. The models tested sought to explore mechanisms that we anticipate will transfer to other country contexts, given they are not reliant on factors specific to the Irish context.

However, the reliance on Irish data alone means that the generalisability of our models to other country contexts is unknown. This is further complicated by ecological concerns: while the impact of the Great Recession allowed us to disentangle effects more effectively, the Great Recession could also have created an abnormal environment, moderating the mechanisms in a manner that would not normally be observed. For example, Study II examined the effect of economic strain on family processes and child behaviours. It could be argued however that the effects of economic strain are worse outside of recessions when the experience is shared less-widely and narratives of personal blame are more likely to be applied. To better evaluate the generalisability of our findings, future research could attempt to replicate the analyses in different country-contexts and in contexts with less extreme socio-economic variation.

In addition to all analyses being conducted on Irish data, each study utilised data from Cohort98 of GUI, which followed children from the end of primary education and through secondary education. This provided a valuable and rich insight into an important period of children's lives, covering transition periods and the emergence of branching points in education that can affect their educational outcomes. While data on early childhood are available in Cohort08, theoretical and analytical concerns led to all models being run with Cohort98. For instance, Study IV was not suited to younger age cohorts since there are not many opportunities in the Irish primary education system for students and their families to make selections that can affect their educational trajectories and outcomes before

adolescence. Study III benefited from being able to match students on factors (including primary school attended) that would predict selection into certain types of secondary school; something that reliance on primary school data alone would not have allowed us to do.

However, reliance on data from age nine to seventeen/eighteen meant gaps between social groups had already manifested themselves by the age at which students entered the observation period, with the result that we could not examine the emergence of these gaps. Similarly, previous research indicates that the effect of social disadvantage and periods of adversity on children is moderated by children's age, with the social background effects weakening with age (Kiernan and Mensah 2009; Noonan, Burns, and Violato 2018). While not all the mechanisms explored in our studies can be run on younger cohort data, future research could try to look at whether developments at younger ages, both in school and at home, affect behaviour, performance and decision-making at later ages.

Lastly, the absence of certain variables and repeated measures also limited the nature of our analysis and, in some situations, our ability to test specific mechanisms entirely. In Study I, the absence of the same repeated measure of self-esteem necessitated using two separate measures of self-esteem. While the measures correlated with each other and were standardised, the variability in the measure of self-esteem could have affected the accurate estimation of the results. While Study II was able to avail of repeated measures over time, the absence of appropriate and consistent measures of intra-parental conflict and parent-child relationship quality in all three waves of data precluded us from testing the Family Stress Model as originally envisioned, with potentially important linkages being missed as a result.

Two particular limitations were faced by Study III. Firstly, the absence of a direct measure of school composition characteristics meant that we were unable to account for the different compositional characteristics of DEIS and non-DEIS schools. Secondly, limited numbers of students within schools precluded us from adopting a multilevel model that would account for students nested in schools. While beyond the remit of the study using Cohort98 data, future research using data with larger samples within schools should seek to adopt a multilevel approach. Furthermore, if sampled students are randomly selected within schools and the sample is sufficiently large, future research studies should aim to calculate the proportion of low-SEP students within school samples and estimate the schools' socio-economic composition directly.

Study IV relied on logistic regression of cross-sectional data, which is less able to account for potential confounders relative to more robust panel models using fixed effects estimators. Moreover, while our findings indicated that students with the same ambition of attending higher education continued to make different decisions along SEP lines, this could potentially reflect the different institutes of higher education and courses aspired to. Differing student subject-level selections could therefore conceivably still reflect unequal aspirations within higher education.

Future research

Future research should expand on the studies compiled here in various methodological and theoretical ways.

Methodologically, a more nuanced measure of SEP could be adopted that does not only rely on class and parental education but also accounts for other factors such as income and resources. Analytical changes could also be made by adopting alternative approaches such as the use of latent variables and Structural Equation Modelling to allow for the inclusion

of more nuanced measures and to better ascertain the paths and variables through which effects are mediated.

Taking a comparative approach by utilising data from several countries could also help confirm whether findings are generalisable across country contexts, and allow for comparison of the Irish case with other countries. While data from the Growing Up in Ireland study provides scope for much future research in its own right, utilising data from other international datasets such as the Millennium Cohort Study (MCS) and the 1970 British Cohort Study can improve the generalisability of findings. This approach would be particularly suited for studies using both Growing Up in Ireland and MCS data, since the Growing Up in Ireland data was modelled on the MCS study design and contains many identical measures. To date, this cross-national compatibility has not been widely availed of in comparative studies.

Furthermore, while the focus of this thesis on children from ages 9 to 17/18 provided a valuable and rich insight into an important period of children's lives, covering transition periods and the emergence of branching points in education that can affect their educational outcomes, it also missed the emergence of social disadvantage gaps that developed prior to and in the early years of school. Previous research indicates that the effect of social disadvantage and periods of adversity on children is moderated by children's age, while the association between children's educational outcomes and social background is also ascertained to weaken as children grow older. Future research could account for the potential moderating effects of children's age by analysing the mechanisms presented in our models with earlier age cohorts. Additionally, utilising life-course data would also enable us to account for earlier household and educational measures when exploring later life outcomes, providing important background information that can help us understand the differing educational trajectories observed.

While our analyses tested several theoretical explanations for the existence of socio-economic inequalities in education, our findings also raised questions that future studies could look at. For instance, while Study IV evaluated student risk aversion among students, a further extension of this could examine whether student risk aversion interacts with the economic context in which these decisions are being made: i.e. are students more or less risk-averse in periods of economic uncertainty? An adverse economic environment could, for instance, encourage students to forgo ambitious but riskier aspirations where the risk of failure is higher, and opt instead for more risk-averse selections. Conversely, the absence of strong career prospects due to recession could encourage some students to strive for more ambitious selections in order to provide themselves with a comparative advantage over peers. If so, do the approaches taken differ by socio-economic position, with lower-SEP students less likely to take the riskier option in periods of adversity as hypothesised by the Relative Risk Aversion model, while higher-SEP students double-down on ambitious goals? In a way, this would update the work of Glen Elder in his classic study ‘Children of the Great Depression’ (1974), which provided important insights into how the experience of recession changed the decision-making of his participants in terms of education and career.

Future research could also explore how differences across SEP groups manifest themselves. For instance, how do individual attributes (such as ability) and communal factors (such as support networks and friendship groups) moderate the primary and secondary effects of social background for students? For example, do students from socio-economically disadvantaged backgrounds, but with exposure to ambitious or academically successful peer groups, emulate the ambitions and performance of their peers? While the research in this thesis has explored the role of individual, family and economic well-being factors in the manifestation of educational inequalities, delving into differences between

students within SEP will help provide a more granular insight into how these processes work.

Concluding remarks

This thesis sought to explore the development and manifestation of socio-economic inequalities in education using representative, longitudinal data from Ireland. Our findings indicate that an explanation focused primarily on socialisation and culturally orientated behaviours could not adequately explain the observed pattern of inequalities. Instead, we find evidence that the psycho-social consequences of financial strain and economic deprivation were far more important in structuring both the academic development and performance of students as well as their educational decision-making.

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