Do Mindsets Matter? What can we discover from the learning
experiences of secondary school students about the relationship
between identity, Implicit Theories of Intelligence, and growth?

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Title of Thesis

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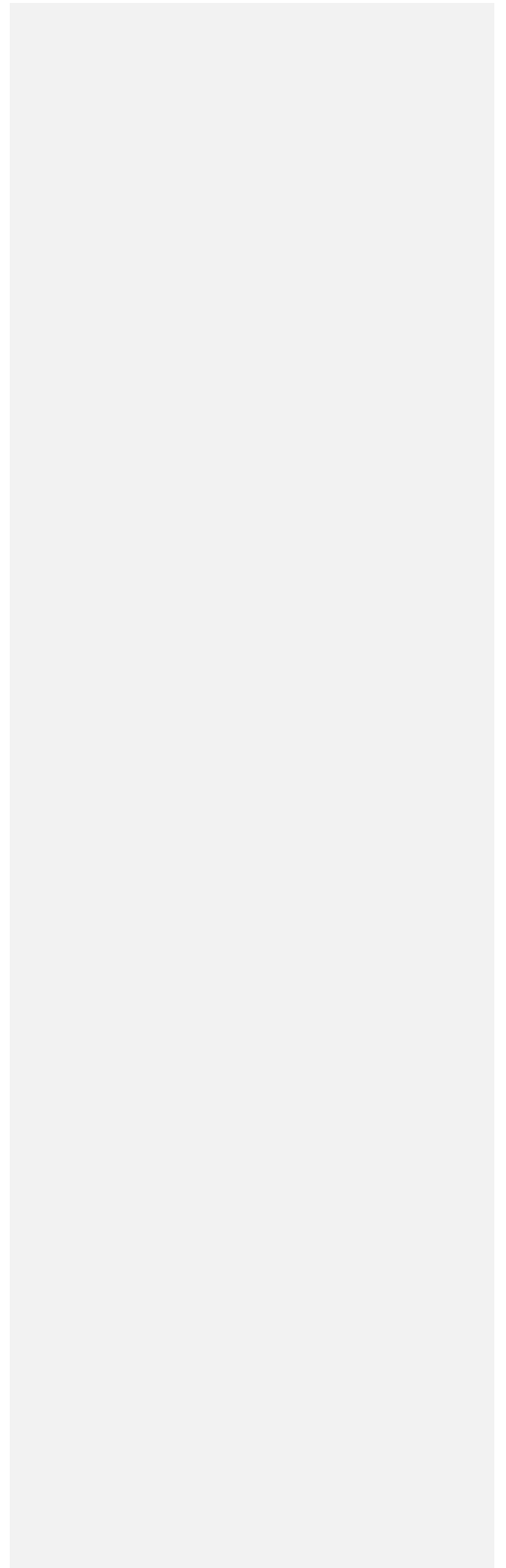
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This thesis results entirely from my own work and has not been offered previously for any other degree or diploma.

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Abstract

Concepts from cognitive psychology are making their way into the school sector to inform school improvement, including Dweck's work on Implicit Theories of Intelligence which was being taken up by educators in the late 1990s and early 2000s. There is strong empirical evidence to suggest believing that intelligence is a fixed trait (i.e., having an entity theory) impacts negatively on academic growth whilst believing that intelligence is malleable (i.e. having an incremental or Growth Mindset) can have positive outcomes in terms of progress. Studies have also shown that Implicit Theories of Intelligence can be manipulated so that learners increase effort and become more resilient.

However, it is proving difficult to find interventions for use in schools that have significant and sustained impacts. Dweck herself has expressed concerns about how her theories are being misunderstood by practitioners and there is a danger that the school sector will start to dismiss an idea it once found interesting without really giving Implicit Theories of Intelligence a chance to inform policy and practice.

This longitudinal nested case study used interviews with students and their parents alongside school tracking data in an attempt to glimpse inside the "black box" of learning and discover how Implicit Theories of Intelligence form part of individual children's Learner Identities and how these identities are affected by family narratives, parental influence, early educational experiences, and the participants' current lived experience of school in order

to determine the extent of the individuals' academic growth. The study also looked at the learning mechanisms that formed the process whereby participants were able to achieve academic growth and examined the interplay between learner identities and learning mechanisms.

Coding interview transcripts resulted in the identification of key elements that made up individual students' Learner Identities and the emergence of a new element, learning literacy. It is this learning literacy that mediates between a learner's identity and experience at school, particularly their access to the main mechanisms of learning identified in this study, to produce negative or virtuous cycles.

The final phase of the study builds on the learning from the case studies and from the literature review to suggest that, rather than use "one-shot" interventions, it would be better to build a whole school system around the understanding that growth mindsets lead to better academic growth, starting with a clear shared model and language of learning.

Contents

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iii

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List of abbreviations

ADHD	Attention Deficit and Hyperactivity Disorder
BTEC	Business and Technology Education Council
CAT	Cognitive Abilities Test
DfE	Department for Education
DT	Design Technology
EBacc/e-bacc	English Baccalaureate
EEF	Education Endowment Foundation
EHCP	Education Health Care Plan
EG	Effort Grade/s
FSM	Free School Meals
GCSE	General Certificate of Secondary Education
GDPR	General Data Protection Regulation
GM	Growth Mindset
IToI	Implicit Theory of Intelligence
IDL	International Dyslexia Learning
KS2	Key Stage 2
KS3	Key Stage 3
KS4	Key Stage 4
KS5	Key Stage 5
MAT	Multi Academy Trust
NC	National Curriculum
PASS	Pupil Attitude to Self and School survey
QLR	Qualitative Longitudinal Research
RAG	Red Amber Green rating
RCT	Randomised Control Trial
RE	Religious Education
RPE	Religion Philosophy and Ethics
SDT	Self-Determination Theory
SES	Socio-Economic Status
SEN	Special Educational Need
SEND	Special Educational Need or Disability
SEP	Special Education Plan
SSP	Student Support Plan
VAK	Visual Auditory Kinaesthetic
YGT	Young Gifted and Talented

Explanation of school terminology

Academic Review

A tripartite review, conducted annually, with a teacher, pupil and parents present to discuss progress, study habits and holistic issues around learning. Structured by a series of prompt questions, the discussions look at what is going well and move on to agreeing actions for the pupils to take to address any issues needing improvement.

Cognitive Abilities Tests (CATs)

A battery of standardised nationally available tests offered by GL Assessment to test pupils' verbal, numerical and spatial awareness abilities. Used by the school in the first few weeks of year 7, the test scores give an indicator of a pupil's baseline ability. One hundred (100) is the national average score, below 90 tends to indicate a level of difficulty requiring additional support and above 120 suggests high ability levels.

Child in Need plan (CIN)

A plan to address a child's unmet welfare concerns and led by a social worker. Parents' consent to a CIN plan and have the right to decline the offer of welfare support.

Child Protection Plan (CP)

A statutory requirement when a child is assessed as being at risk of significant harm. Led by a social worker and overseen by an independent review officer, all those named on the plan have a duty to protect the child and parents are obliged in law to co-operate with the plan.

DfE Median

The grade achieved by 50% of the last three years' national GCSE cohort who share the same baseline SAT score. Used as a benchmark in school to indicate the minimum grade required for students.

DfE Upper Quartile (UQ)

The grade achieved by the top 25% of the last three years' national GCSE cohort who share the same baseline SAT score. Used as a benchmark in school to indicate the target grade for students.

English Baccalaureate (E-Bacc)

A suite of subjects that the majority of pupils are expected to take at GCSE. It includes English and English Literature, Mathematics, 2 Science subjects, a language and a humanities subject (but not Religion, Philosophy and Ethics). School progress measures calculate the number of grades achieved by pupils in these subjects and penalise schools who do not routinely enter the majority of their pupils for these subjects. It is not a qualification itself.

Effort grades

A grade from 1-5 given half-termly by teachers to indicate the level of effort made by a pupil within an individual subject. Based on a set of criteria, the school regards 3 as "coasting", 5 as exceptional effort and 1 as extremely poor effort levels. Over several years the school has collated data on the relationship between effort grades and GCSE outcomes and demonstrated strong correlation in the data sets to the extent that an effort grade average of over 3.82 is a good indicator of DfE UQ performance.

INSPIRA

The careers advisory service with a statutory obligation to provide support for pupils with Education, Health and Care Plans and Looked After Children. It collects and provides destinations data for each school's year 11 cohort.

Level 2

A pupil achieves level 2 if they pass GCSEs with grades 4 or above. Grades 1-3 indicate a level 1 achievement. The levels also apply to technical awards so that a Level 2 Pass equates to a grade 4.

Level 3

Level 3 qualifications include A levels, level 3 technical awards and apprenticeships and are associated with post-16 provision.

Pupil Attitude to Self and School (PASS)

A commercial product by GL Assessment that produces wide ranging data on pupils' attitudes to school, learning and their abilities.

Predicted grades

Grades given by subject teachers in school indicating the grade they expect a pupil to achieve by working at their current level of effort.

Prior attainment

A pupil's Standardised Attainment Test score indicates attainment at the end of Key Stage 2. This is used as a baseline by the DfE to indicate appropriate outcomes at the end of year 11. The cohort is divided into low, mid and high bands for prior attainment. The data are used in schools to analyse progress data at collection points during secondary school.

Progress tracker

An online progress report available to parents, comprising effort grades, recent attainment data, e.g. from internal examinations, teacher comments and predicted and target grades. KS4 trackers also show DfE median and UQ grades.

Progress 8

An overall figure given to the school representing the progress a cohort has made against their prior attainment data in English and Mathematics (which are double-weighted) ,3 E-Bacc subjects and 3 open or foundation subjects taken from a definitive list. The score is an indication of that school's performance adding value in comparison to the national cohort that year.

Pupil Premium

Additional funding given to schools for pupils who have been on Free School Meals during the previous 6 years, pupils currently on Free School Meals, Looked After Children, adopted children and services children. Schools are expected to use the funding to counteract disadvantages experienced by these groups and held to account for the progress of these children.

Standardised Attainment Tests (SATs)

These are tests in aspects of English and Mathematics taken by pupils in primary school at the end of KS2. They are used as prior attainment data by the DfE to assess a school's Progress 8 score.

Target grades

Grades teachers think their pupils could get if they increase effort levels or adopt improved study habits as suggested in an academic review.

Children, pupils, or learners?

Wherever possible, I have used the words "child" or "children" to refer to all those young humans affected by this study, believing that the terms emphasise their humanity and stress their rights to care and an education, whilst acknowledging that their lives are still determined by the actions of adults. I use "pupils" when I refer to groups of children and their relationship with a teacher, class, or school. "Learners" is used to refer to a wider group encompassing those in school, college, and university whilst "participant" is a specific reference to the cohort of 11 children who came with me on this journey of discovery.

x

List of Figures and Tables

Fig. 2.1 An illustration of the negative cycle
Fig. 3.1 Overview of stages in the analysis
Fig. 3.2 Adapting the original concept framework
Fig. 3.3 Initial coding map
Fig. 3.4 Thematic mapping of types of setbacks
Fig. 3.5 Graphic presentation of the dynamics within individual
      case studies
Fig. 4.1 Illustration of the dynamics in Alex's case
Fig. 4.2 Illustration of the dynamics in Beth's case
Fig. 4.3 Illustration of the dynamics in Ellie's case
Fig. 4.4 Illustration of the dynamics in Lennie's case
Fig. 4.5 Illustration of the dynamics in Oscar's case
Fig. 4.6 Illustration of the dynamics in Vicky's case
Fig. 4.7 Individual Learner Identity Formation
Fig. 4.8 The relationship between learner identity and the
      learning mechanisms

Table 2.1 A summary of Dweck's self-theories
Table 2.2 The self-regulation cycle and different implicit theories
Table 3.1 Dimensions of comparisons in qualitative longitudinal research
      and related aims
Table 3.2 Initial research questions set against available data
Table 3.3 The original 11 participants
Table 3.4 Initial coding of focus group discussions
Table 3.5 Mindset scores and mindsets across the curriculum
Table 3.6 Early thematic coding based on year 9 curriculum interviews
Table 3.7 Longitudinal change for individuals across cases
Table 3.8 Key themes and sub-themes for the second stage of the analysis
Table 3.9 Case study participants showing the range of pupils
Table 4.1 Implicit Theories of Intelligence and outcomes

Chapter 1 Introduction

This thesis reports on an investigation into the impacts of Implicit Theories of Intelligence, or Mindsets, on outcomes for eleven secondary school children. After promising evidence from international research that Mindsets influence learners' levels of engagement with and attitudes to study (Aronson & Fried 2002, Blackwell & Trzesniewski, 2007, Claro et al,2016, Costa & Faria, 2018, Dweck,1999, Dweck,2012, Good et al, 2012, Rattan et al, 2012, Yeager et al, 2019,Yeager, 2012) there was an enthusiastic response from many educators who adopted the expression Growth Mindsets hoping that the approach had potential to help their students, thus heralding what Sisk et al describe as the "mindset revolution" (Sisk et al, 2018, p.14).

The basic premise, discussed in more detail in Chapter 2 of this study, is that, if a learner believes that intelligence is innate and not subject,
 to change, they will react more negatively to setbacks, avoid effort, and display helplessness patterns while learning, whereas, if they believe that intelligence is malleable and capable of developing through effort and challenge, then they will adopt a mastery approach to learning, using setbacks as learning opportunities. Dweck called these mindsets fixed-entity and growth mindsets respectively and urged educators to understand the impact that these mindsets – and aspects of their own practice were having on learners, both in terms of progress and wellbeing (Dweck, 1999, Dweck, 2006).

1

Here in the United Kingdom, the Education Endowment Foundation developed a randomised control trial called Changing Mindsets (Foliano et al, 2019) to look at the potential for mindset interventions to impact the progress of primary school children, whilst Growth Mindsets were one of the six interventions subject to large scale randomised control trials as part of the 2016 Closing the Gap: test and learn programme (Churches, 2016). Neither trial was able to demonstrate a statistically significant impact. Nevertheless, the interest in applying mindset theory to the classroom became part of a particular agenda around promoting resilience in school children. The DfE developed a keen interest in "Character Education", publishing non-statutory guidance for schools in 2019 (Department for Education, 2019) partly as a response to a burgeoning mental health crisis widely reported in the press, and partly as a response to disadvantage. The framework takes one of its four aspects of character from mindset research:

> the ability to remain motivated by long-term goals, to see a link between effort in the present and pay-off in the longer-term, overcoming and persevering through, and learning from, setbacks when encountered (Department for Education, 2019, p.7).

and asserts that studies have suggested that "schools which develop pupils'" character will help drive equity and social mobility for their (Department for Education, 2019, p.7).

Critics of the way the DfE have taken up mindset theory fear that the approach risks becoming another way of blaming poor children for their lack of progress, ascribing it to having the wrong attitude, whilst Dweck, the

leading researcher in the field expresses frustration at the way Growth Mindset is becoming "the new self-esteem" due to its misuse (Bloom, 2017, Rustin, 2016). Growth Mindset is being taken up by schools with little understanding of the detail in the research. This is part of a wider problem about the relationship between the education profession and research more generally and is something I will address in this study. Whilst some schools stay close to the research by teaching children about the plasticity of their brains, others exhort pupils to try harder, to see failure as helpful, put the word "yet "at the end of sentences that start with "I can't" (TidyLadyPrintables, 2019) and portray fixed-entity thinkers as children with "negative attitudes" to learning (We Are Teachers, 2021). In one particular example, based on Star Wars, growth mindset thinkers were represented on a poster by Yoda, a wisely benign character, whilst fixed-entity thinkers were represented by Darth Vader, the evil antagonist from the "dark side" (Grow Your Mindset, 2020).

Haimovitz and Dweck published a "New Proposal" in response to these concerns, especially the impact of fixed mindset cultures within education itself:

> It is vital, then, for researchers to continue to understand the origins of children's mindsets and particularly the socialization practices that foster them. But it is equally important to use our knowledge to ensure a quality educational experience for all – one that keeps our children committed to growth and eager to learn (Haimovitz, 2017, p.14).

My own observations as a senior leader in a large secondary school with a comprehensive intake led me to wonder about the usefulness of mindset

3

theory. I was familiar with the vulnerable able girls whose performance goals and validation seeking led them to anxiety and disorders, and I was familiar with the children – and parents – who attributed difficulties and failures to factors outside their locus of control like teacher blaming or narratives of inherited inabilities. I was less aware of children who sought out challenge and failure in order to achieve mastery and wondered if there were factors other than mindset at play. Dweck's work was, however, persuasive. I first encountered it on a professional development course about supporting Gifted and Talented children when it was presented as a way to promote the development of mastery in children for whom schoolwork could be too easy. I recognised the risk averse able learner straight away and felt that the message that brains were plastic and needed challenging was a helpful one, but I could not see how I could change the mindsets of the children in my school and wanted to find out more. I was surprised when the approach re-appeared as a possible way to counter disadvantage and sceptical when it became part of the call by policy makers for children to be made resilient by schools but felt that there was a strong case for the relationship between Implicit Theories of Intelligence and students' experiences of learning, if only we could understand it more.

When I started the study, I was Head of School in a large rural 11-18 comprehensive academy. The school had a traditional approach to curriculum and setting at Key Stage 3 and 4, based on prior attainment, and had a good track record in terms of Ofsted judgements and examination results. I was, however, concerned that the 5 or more A*-C grade measure hid some

underachievement within the cohorts and was sure that this would be increasingly apparent with the change in progress measures. This indeed proved to be the case. Some children were demonstrably making less progress than others in this outstanding school. I had introduced a technical and vocational curriculum a decade earlier which had borne fruit in terms of engagement and progression routes for children who were at risk of disaffection, and I was concerned that the changes to accountability measures and the cessation of funding for vocational courses would have an adverse effect on the progress and well-being of significant numbers of children. I therefore bid to the DfE to open a Studio School as part of its Free School Programme, sponsored by the academy where I was serving as Head of School. That school opened its virtual doors in September 2017 with a year 10 cohort of 90 pupils and a small sixth form and I became its Principal. It offered 6 technical pathways, linked to the local community and economy, and supported by local employers.

I was aware, however, that the structural and curriculum change afforded these children by the Studio School was only part of the answer when it came to addressing reasons for academic growth. Why were children with the same starting point and the same provision experiencing schooling so differently and with such different outcomes in terms of qualifications and destinations? After a review of the literature around mindsets I wondered what an in-depth study of a group of children in my school would reveal about the formation of mindsets, or Implicit Theories of Intelligence (the terms are interchangeable) as well as about the ways that mindsets impacted on the children's

experiences of learning in school, if indeed they did. I also wanted to see what I could discover about how schools could work with the idea of mindsets to improve teaching and learning.

This study followed 11 children for three years, starting in year 9 and taking then through to the end of their compulsory education. Six of the participants moved from the sponsor academy into the new Studio School for their Key Stage 4 and thus accessed technical courses. This first cohort continued to be taught their English, mathematics and science in setted groups along with pupils in the sponsor academy, however. Five participants remained on the roll of the sponsor academy. I explored the participants' thoughts and feelings about their abilities and their lived experience of learning in school as well as their memories of primary school and transition. The study also included their parents as they discussed their children's abilities, progress, and aspirations in annual reviews. Alongside interview data, the study looked at school progress data to chart the participants' progress according to their teachers and national testing.

There follows an outline of the research questions used to shape the study and then, in the next chapter, a review of the literature relating not just to mindsets but to a wide range of issues that became relevant as the study progressed, including identity formation, motivation, metacognition, self-regulation and assessment, particularly feedback. The methodological approach is discussed before the findings - which include six detailed case studies of individual participants - conclusions and recommendations. The

recommendations include a reflection on the experience of conducting research in a school where I am a senior leader with some further recommendations to leadership colleagues who are interested in using research to better understand and develop their schools. It is hoped that this study will further understanding of the way children's mindsets interact with their lived experiences in school and prove valuable in highlighting improved approaches within schools for all learners.

1.1 Research questions

1. To what extent are mindsets binary? Are children simply growth or fixed-entity, or do mindsets vary across different activities?

2. Do Implicit Theories of Intelligence have an impact on school outcomes such as grades and destinations?

3. What are the processes that lead from Implicit Theories of Intelligence to school outcomes?

4. To what extent are there more complexities involved in the translation of Implicit Theories of Intelligence into outcomes? e.g., the social and reciprocal nature of education, or the role of communities, families, and parents?

7

5. The one-shot interventions around mindsets create marginal impacts that are difficult to sustain: what CAN schools do to improve the learning experience and outcomes for children?

Chapter 2 Literature review

2.1 What is Growth Mindset theory?

The two decades at the end of the twentieth century saw a shift in emphasis within education theories from a belief in the primacy of innate intelligence to an understanding that academic attainment is a complex issue involving the relationship between self-concept and self-efficacy, whereby a dynamic relationship between the cognitive, affective, and motivational mediates between self-belief and outcome. The idea that someone's beliefs about the nature of intelligence can have a significant impact on their well-being and achievement started to emerge during the 1980s after a decade of research had challenged the idea that success was mainly a result of intelligence. The idea that intelligence was innate influenced educational thinking up to that point, for example in the notion of Intelligence Quotient measurement or the entrance examinations to selective schools (Stough, 2015). The study of motivation shifted to a social-cognitive approach which led to the theory that, rather than intelligence, the ability of an individual to acquire skills was a more reliable predictor of successful outcomes.

Research rooted in the psychological tradition explored possible answers to questions about why intelligent learners could at times display helplessness patterns of behaviour like challenge avoidance. Ability level seemed to have very little to do with the extent to which learners adopted either adaptive or maladaptive behaviours. In an important study, Dweck and Elliott (1983) proposed that the mechanism that led to helplessness or its opposite behaviour pattern, mastery-oriented behaviour, started with the setting of

different types of goals. If a learner's priority was their performance, then they were likely to be vulnerable to helplessness patterns whereas learners who set themselves learning goals were far more likely to adopt mastery-oriented practices.

Dweck and Leggett (1988) worked on a model they described as a "social-cognitive approach to motivation and personality" and tested their theories extensively, eventually proposing that the learners who set themselves performance goals were entity theorists, that is they held an implicit belief that intelligence is a fixed trait that cannot be improved on. Conversely, incremental theorists hold an implicit belief that intelligence is a malleable trait that can be developed through challenge and striving. They therefore tend to adopt mastery-oriented or learning goals. Entity theorists achieve self-esteem through achieving performance goals (e.g., getting something right or gaining high test scores) whilst incremental theorists achieve self-esteem through a sense that they are making progress towards their own mastery of a skill or discipline. Dweck and Leggett (1988) asked if understanding learners' Implicit Theories of Intelligence, an idea that became known as Mindset Theory, helped with understanding the global construct self-concept, an issue attracting a considerable amount of interest towards the end of the last century. Studies in the last decade have, however, isolated mindset theory from this wider global construct and focussed in on fixed-entity learners' belief that intelligence is innate, separated out from other aspects of their self-concept, in order to address academic underachievement (Burnette et al, 2013). Why has there been a narrowing of focus since the 1980s in relation to

Mindset Theory and what can we learn from the other literature on self-concept that can help us to understand how learners see themselves?

2.2 A summary of ideas in Dweck's Mindset Theory

Dweck's contention is that there are two distinct implicit self-theories of intelligence held by learners: entity theory and incremental theory (Dweck, 1999). Entity theorists believe in the innateness of intelligence and view it as a fixed concept, fearing any setback that therefore suggests that they are not as intelligent as they would like to appear. Incremental theorists believe that intelligence is a malleable thing, improved by effort, practice and risk taking. They view setbacks as learning opportunities. I have represented the main contrasts between the two self–theories expounded by Dweck (1999) in Table 2.1 below.

Entity theorists	Incremental theorists	Page reference
Believe that intelligence is fixed and innate	Believe that intelligence is a measure of what we can do now and that we can become more intelligent through learning, i.e., is malleable	p.2-3
Demonstrate "helplessness" in the face of setbacks	Show "mastery-oriented" traits in response to setbacks	p.7-10
Have performance goals	Have learning goals	p.16-19

Entity theorists	Incremental theorists	Page reference
Have validation-seeking goals	Have growth-seeking goals	p.47-50
Minimise or even withhold effort	Value effort	p.40-42
Are vulnerable	Have resilience	p.53 p.144 -147
Are more anxious in school	Are less anxious in school	p.144 p.147
Assume that rejection is due to lack of social ability	Seek relationships that promote future growth	p.64-67
Believe that their underlying character could be revealed by a single behaviour and that a mistake means you are a bad person	Believe that character traits are the results of experience and that mistakes are ways of learning and developing	p.104-105
See peers as rivals	Help peers to learn	p.130-131
Function well in primary education then struggle later on	Do better later on as the education system starts to value problem-solving and risk taking	p.124

Table 2.1 A summary of Dweck's self-theories Dweck recommends that teachers and parents take care with praise and criticism:

intelligence praise appeared to foster the theory of fixed intelligence; a belief we know is associated with vulnerability. Effort praise, in sharp contrast, promoted a host of desirable outcomes (Dweck, 1999, p. 120).

She warns against person-oriented feedback in which children are judged according to their personal qualities and emphasises the need for critical feedback which focuses on alternative strategies. She asserts that intelligence praise makes children too performance-oriented thus sacrificing learning opportunities. Instead, she stresses the need for effort praise which leads to discussions about process and strategy. She even maintains that we should apologise to children for wasting their time if they succeed at a task with minimal effort. "We should not be making easy successes into the pinnacle of accomplishment, and we should not be teaching our children that low-effort products are what they should be most proud of" (Dweck,1999, p.121).

She is concerned about bright girls, calling them "the group with the most vulnerability to helplessness" (Dweck,1999, p.54) and recommends for them an emphasis on challenge, effort, and strategy. She makes a plea for educational professionals to teach children, "an alternative framework in which effort is expected and enjoyed and setbacks are informative and challenging" (Dweck,1999, p.123).

2.3 Questions raised by Dweck's Mindset Theory

Mindset Theory (Dweck, 1999) poses as many questions as it attempts to answer, particularly for education practitioners. Firstly, the studies that led to the findings in the book are based on laboratory-style testing using problem-solving activities in isolation. There is, however, a whole complex lived experience of school with its range of subjects and different learning challenges, for example, literacy development, creative projects or acquiring deep understanding of knowledge. Marsh has suggested that children's academic self-concepts are diverse and subject-specific (Marsh et al, 1991). In the same paper, Marsh et al demonstrate that the internal frame of reference results in children comparing their own self-concepts within different subject areas. Does it follow that subject-specificity applies to Intelligence Theory? Do children have greater resilience to setback in subjects they feel confident about?

Secondly, Dweck says little about the role of the teacher or the effect of the school's climate or socio-cultural norms in terms of children's behaviours and outcomes. Do they mediate at all between implicit self-theories and outcomes? Both Hattie (1992) and Bandura (1997) insist on the importance of high-quality feedback and mastery guidance in order to support positive academic self-concept so that it results in academic growth. Hattie examines a range of influences on self-concept including the family and social status. Rogers talks about the "valence" of school and school subjects to families and social groups and the impact that values have on orienting self-concepts either towards or away from school (Rogers, 1982). Educators know that the correlation between disadvantage and under achievement is difficult to disrupt

and that family norms are their greatest asset or their most difficult challenge when it comes to children making progress.

Finally, what about children with Special Educational Needs, emotional and behavioural difficulties, or mental health problems? Do these significant disadvantages inform Implicit Theories of Intelligence or make it harder to adopt adaptive behaviours? Dweck discusses the problem of high-achieving children, especially girls for whom a fixed-entity belief about intelligence can lead to worrying levels of vulnerability, but she spends very little time on the group she calls "low-achieving", exhorting educators not to use intelligence praise when they succeed but to direct attention and approval at their efforts or strategies. Practitioners working with children whose difficulties present significant barriers to learning know that these children have complex needs, often presenting co-morbidly. How do these professionals adapt practice around developing growth mindsets for these children?

By the time Dweck's set of essays, "Self-theories" was published in 1999 (Dweck, 1999) the teaching profession was being encouraged to engage with the idea of an academic self-concept. Education sectors, particularly in the UK and the United States were under pressure from government to show continuous improvement in outcomes and the idea that you could positively impact achievement through Mindsets had a definite appeal, not least because it appeared to mitigate intractable issues in education like class, economic disadvantage, race, and gender. There are problems with the practical applications of self-concept theories, however, and various attempts

to translate these theories around self-concept into a school improvement agenda, particularly one focussed on closing the attainment gap caused by disadvantage have failed to have an impact, quite possibly because Growth Mindsets in schools takes this part of self-concept theory out of its detailed and complicated theoretical context.

2.4 What has been learnt from interventions based on Mindset Theory?

There are now a number of published Mindset studies. The 20 years after the publication of Dweck's "Self-Theories" (Dweck, 1999) have seen a series of attempts to trial interventions designed to re-orient students' implicit theories of intelligence. They are usually based on "one-shot" interventions, mainly explanations to children of how the brain learns, but none of them have achieved significant long-term changes in terms of outcome. The studies are helpful, however, in that they do indicate other factors that interact with Implicit Theories of Intelligence in order to create or prevent academic growth. The first is socio-economic and racial disadvantage. The finding, across a range of studies, that low Socio-Economic Status tends to lead to fixed entity thinking about intelligence is interesting and suggests that Implicit Theories of Intelligence could have their roots in the social and cultural experiences of children. Interventions designed to persuade African-American college students of the malleability of intelligence, by asking them to teach others about the ability of the brain to become more intelligent with effort, did create change in the students' self-theories, but the disadvantages associated with the students' race and social status meant that in spite of the progress there remained an attainment gap (Aronson & Fried 2002). A study by Claro et al

(2016) found in a nationwide sample of high schoolers in Chile that a growth mindset (i.e., an incremental implicit theory) was a comparably strong predictor of achievement that served to buffer the effects of poverty on achievement but that participants with low Socio-Economic Status (SES) were less likely to hold growth mindsets. Thus, not only was social disadvantage a barrier to attainment (Aronson & Fried, 2002) fixed-entity thinking was also more likely to be associated with children from low SES backgrounds. The relationship between disadvantage and Implicit Theories of Intelligence was also explored in a UK study when Warren et al (2019) trialled malleability priming interventions with primary school pupils in Portsmouth, by teaching them about the potential of the brain to become more intelligent with effort. They found that, whilst there was a significant correlation between Implicit Theories of Intelligence and attainment, there was no statistically significant effect for pupils with Special Educational Needs (SEN) or who were classed as disadvantaged by the UK's Free School Meals (FSM) indicator of low Socio-Economic Status (SES). The researchers wondered if Bourdieu's contention that, "structural inequalities can give rise to psychological inequalities" (Reay, 2004), goes some way to providing an explanation for the impact of low SES on children's' implicit theories. Warren et al propose widening the scope of the interventions to the norms adopted within classrooms:

> as well as encouraging children to hold an incremental theory of intelligence, interventions also need to focus on encouraging children and those around them to adopt behaviours that enable them access to additional support and resources. (Warren et al, 2019, p.12)

Additionally, studies have shown having a learning disability or a Special Educational Need affects Implicit Theories of Intelligence. Warren et al (2019) found that mindset interventions had little impact on children with SEN. This finding coincides with an earlier study by Baird et al (2009) that looked at intelligence theories along with academic self-efficacy, goal preferences and effort attributions and their effects on cognitive self-regulation in children with and without learning disabilities. The study suggests that low academic self-efficacy can be overcome by incremental theories of intelligence but that children with learning disabilities are more likely to hold fixed trait beliefs of intelligence along with low academic self- efficacy, a preference for performance goals based on quantitative outcome, and maladaptive learning approaches like challenge avoidance, low effort, and helplessness patterns in the face of setbacks.

Thus, if we consider factors like socio-economic status, race, or disability, we need to question the use of the "one size fits all" interventions trialled in these studies. The need to be more context sensitive and personalised when intervening to challenge mindsets in children becomes even more pronounced when studies have concluded the need to consider heterogeneity in the cohorts involved. A 2007 study by Blackwell et al looked at the impact of interventions on children undergoing transition to junior high in the US. The researchers observed that whilst interventions were leading to significant improvements in achievement in studies it was difficult to sustain the impact to create long-term trajectories. This 2007 study focused on mathematics and

observed that the experimental group did show a shift in their Implicit Theories of Intelligence, whilst teachers reported an increase in motivation. Crucially, the study identified that the gap starts to widen between entity and incremental theorists at transition. Before then, entity theorists were managing well, "in a supportive, less failure-prone environment" (Blackwell &and Trzesniewski, 2007, p.258). Blackwell et al (2007) also noted that there was variation due to the heterogeneity of any group of children in a study leading to substantial differences between individuals during the same development period.

Another substantial difference between learners is the nature of their original Implicit Theories of Intelligence. Burns and Isbell (Burns, 2007) looked at the impact of priming implicit theories on female students of different mathematics abilities in higher education. They argue that malleability priming (explicit teaching about the brain's ability to learn and grow) is more useful for students who have the capacity to grow in their abilities. Incremental theorists had little need for malleability priming - the suggestion is that there could be a ceiling effect - whilst entity theorists with perceived low ability tended to struggle. The group to benefit most from malleability priming were the entity theorists with perceived high levels of ability. Burns and Isbell (Burns, 2007) also explored the issue of trait consistency. Their intervention was a temporary manipulation of participants' implicit theories so that they were capable of holding both entity and incremental views simultaneously. They warn against theory violation, concerned that people could respond negatively to interventions inconsistent with their own theories and they even venture

that in situations where performance goals are important, for example where it is vital to pass a test, entity theorists can perform well. Thus ability level and context are both considerations when using malleability interventions:

> Malleability is not a one-size-fits-all belief and may not have the benefits for all in terms of performance. Other techniques may be needed to deal with entity theorists, and these should be explored in future research. (Burns, 2007, p.61)

More recent studies have in fact pointed to the importance of context. A large-scale intervention trial by Yeager et al (2019) found that whilst a one-hour online course to prime for malleability beliefs could have a significant impact on outcomes, these outcomes were tempered by the learning environment. Sustained benefits following trait re-orientation came when peer norms were supportive and aligned with the messages of the intervention, thus pointing to the significance of the organisational culture of learning created in schools and to the broader scope of any work to use mindset theory to improve outcomes for learners. Yeager et al highlight the importance of considering heterogeneity effects, noting that in earlier efficacy trials the effects were considerably weaker when scaled up and thus discarded early without a thorough investigation of the contexts and sub-groups.

Yeager et al's suggestion that there could be an issue with the efficacy trials is a recurring theme in the literature. As early as 2002, Robins and Pals were extending the implicit self-theory model into a "real world achievement context" (Robins, 2002 , p. 3). They looked at trait stability over time in college

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20

students, considering success attributions as well as explanations for failure. They found that Implicit Theories of Intelligence may become more schematised as children mature through adolescence, but that change is certainly possible at an individual level. A focus on the possible buffering effect of self-confidence or perceived performance results in counter-intuitive findings. Entity theorists whose helplessness pattern had rendered them too fragile were not protected by self-confidence. Additionally, Robins et al suggest that entity theorists do not take credit for academic achievement, perceiving an external locus of control. Importantly, this focus on the individual in real-world research led them to conclude that despite the loss of control in the study, "it has greater ecological validity because individuals are able to construe their actual academic experiences in ways that are personally meaningful to them and reflect long-term patterns of performance" (Robins, 2002, p.19).

Dweck herself was aware that Mindset Theory needed to embrace the complexities suggested in this series of intervention studies. In a special edition of The British Psychological Society's Journal on "Growth", Dweck discusses the need to know much more about, "the contexts that foster beliefs and goals that create growth" (Dweck, 2015, p.3). She calls big data a "mixed blessing" and stresses the importance of "the psychology of the student". In other words, the need to understand all the working parts guiding learners' emotional responses, inner thoughts, and then behaviours as they connect to academic performance.

Two decades after the first publications on Mindset Theory, studies had identified the importance of the personal, social, and cultural factors impacting on the lives of learners to form mindsets and to make them impervious to change (Aronson & Fried, 2002, Claro et al, 2016, Baird et al, 2009, Warren et al. 2019). Studies had also suggested that educational organisations had a role to play (Warren et al, 2019, Yeager et al, 2019). The surprisingly limited references to the impact on learners of teachers and parents in the early literature on Mindset Theory was addressed by Haimovitz and Dweck when they identified that parents and teachers with growth mindsets were not passing them on to the children in their care (Haimovitz, 2017). Previously, research had focussed on the way that adults praise children, recommending the efficacy of process praise to encourage malleability traits. They found that the mechanism affecting children was not the adults' beliefs about intelligence but their beliefs about failure. The way they responded to children's failure reflected their belief that failure was either motivating or demotivating, the most effective response being to normalise striving through setbacks as part of the learning process.

In the case of teachers, it was their learning and process-oriented practices that pointed to their pupils' implicit theories, not their own mindsets. The most effective teachers at creating Growth Mindsets taught for understanding, reflected on the learning process honestly, modelled their thinking and demonstrated to their pupils what incremental progress looked like. They hard –wired effective feedback into their practice so that pupils revised their work to demonstrate deeper understanding and they were explicit about how mistakes

and striving led to better learning outcomes. The least effective teachers responded to their pupils' abilities, praising those who get things right and worked quickly and making social comparisons between children.

The study by Haimovitz (2017) highlights the importance of the classroom as a setting for Mindsets to be socialised through creating cultural norms, for teachers to be reflective about their pupils' setbacks, developing their practice in response, and for further work to be done on theories of motivation and on institution level policies and norms to promote growth mindsets. We need to, "continue to understand the origins of children's mindsets and particularly the socialisation practices that foster them" (Haimovitz, 2017, p.1857).

It is certainly important for practitioners in the education sector wishing to implement reforms inspired by Mindset theories to understand the mechanisms that:

a) Create implicit theories
b) Impact on implicit theories over time
c) Are the bridging processes between implicit theory and achievement

The limited success of efficacy trials described above is attributed to a number of variables associated with the social or individual rather than the cognitive domains. Aronson (Aronson, et al., 2002) is aware that making socially disadvantaged learners more incremental in their mindset cannot compensate for that disadvantage. This is borne out in other studies. Claro observes the correlation between low Socio-Economic Status (SES) and fixed entity traits (Claro et al, 2016) as do Warren et al in the UK study (Warren et

al, 2019). Baird explores the connection between learning disabilities and fixed-entity thinking (Baird et al, 2009) and this is also echoed in the study by Warren et al (Warren et al, 2019). Burns is clear that there is no "one-size-fits-all" solution to using mindset interventions: much depends on ability and context (Burns, 2007). As Yeager et al conclude in their 2019 study: "Sustained change may therefore require both a high-quality seed and conducive soil in which that seed can grow" (Yeager et al, 2019, p.5).

2.5 Self-concept, academic self-concept, and the self-system

Mindset theory arose from research into self-concepts, focussing on academic self-concepts and isolating learners' implicit theories about the nature of intelligence as an important aspect of their self-system. It is logical to assume that there are other aspects of the self that are also influential. Are there more complexities involved in a learner's self-system than Implicit Theories of Intelligence and, if so, how do these complexities interact within that system?

There is an extensive range of literature exploring self-concept, too much to detail here in this review. Interest in the relationship between self-concept and academic attainment led to studies that observed that it was difficult to effect changes to self-concepts. Rogers (1982) discussed a complex and composite definition of self-concept within a self-system, including self-esteem and self-worth, self-concept being what we think we are like, self-esteem being contingent on whether we like what we think about ourselves and self-worth being our sense that we have agency. There was evidence from studying the

development of children's self-concepts over time that academic self-concept emerged during the secondary phase of education (Rogers, 1982, Hattie, 1992). Studies of academic self-concept suggested that secondary school children were subject to both internal and external frames of reference leading to the development of academic self-concepts. Marsh et al (1991) found that internal frames of reference led to students comparing their own abilities in mathematics and English, whilst external references led to them using comparisons with peers, leading them to suggest the importance of, "students' cognitive, affective, or motivational mediating processes" instigated by their self-efficacy beliefs (Marsh et al, 1991, p.343). Comparisons with peers took on increased significance in the understanding of the development of academic self-concept when Huguet and Marsh looked further at the impact of external frames of reference in their 2009 study of the so-called "Big Fish Little Pond Effect" (Huguet et al, 2009). Their conclusion points to the need for an integrated approach that looks at social comparisons as they occur naturally.

In an earlier paper Marsh looked at the structure of academic self-concepts (Marsh, 1990) finding that academic self-concepts had many different components: "Apparently, students differentiate academic self-concepts in different school subjects to a much greater extent than had been previously recognised" (Marsh, 1990, p.635). This suggestion that academic self-concepts vary across the curriculum begs questions about Implicit Theories of Intelligence. Firstly, to what extent are Implicit Theories fixed in terms of the

25

breadth of learning activities for children? Secondly, how do Implicit Theories interact with academic self-concepts?

Further studies of self-concept underline that not only does self-concept vary according to academic context, but it is also subject to a wide range of factors. Hattie (Hattie, 1992) describes the construct as a multi-faceted set of "cognitive appraisals" of our attributes and suggests that socio-economic status, family structures and family psychological processes, together with social status, are significant influences. He also stresses the importance of high-quality feedback to learners, particularly those whose academic self-concepts are in decline, suggesting that this leads to a higher degree of "empowerment" over the processes of learning. Both Hattie (1992) and Marsh (Marsh, 1990) refer to competence beliefs in learners as integral to academic self-concept. This was extended by Bandura (Bandura, 1997) when he developed the understanding of the self-system in his detailed work on self-efficacy where he posited that self-concept was mainly a set of personal efficacy beliefs. Schools, he says, can undermine a student's sense of personal efficacy with unhelpful practices like lock-step sequences of instruction or socially competitive grading practices. Like Dweck (Dweck, 1999), Bandura points to the importance of intelligence theories based on the notion that ability is built through sustained effort but warns that telling a low ability child to work harder without the means to translate effort to success can be demoralising. He stresses the importance of "guided mastery". This long-term pedagogical approach seems to be an important exhortation for anyone working with previously unsuccessful learners, but one that seems to

26

be missing from mindset interventions that have been trialled in education settings.

2.6 Can other literature help to explain the limited success of mindset interventions in school settings?

Mindset interventions studies conducted in the last five years have pointed to the need to consider the context for learning as well as the lack of homogeneity in any cohort of children (Warren et al, 2019, Yeager et al, 2019). Social background (Aronson & Fried, 2002, Claro et al, 2016, Warren et al, 2019), disability (Baird et al, 2009) and classroom norms (Warren et al, 2019, Yeager et al, 2019) all seem to be significant considerations when trying to understand the difficulties researchers have encountered in challenging fixed-entity thinking in children. Dweck's original work on mindsets (1999) focussed on the psychology and behaviour of individual learners without asking questions about teachers or schools, and without asking questions about the emotional, social, or cultural experiences of the children taking part in the studies.

The socially situated nature of children's educational experience is nevertheless an important theme in the research around self-concepts, self-esteem, and self-efficacy. Marsh et al (Marsh et al, 1991) suggested that children used social comparisons with peers as an external frame of reference to create self-concepts, highlighting selective practices in the school system as potentially damaging to children's academic ability concepts by creating

27

the "big-fish-little-pond effect" (Huguet et al, 2009). The practice of within

school selection, in other words ability setting, has also been criticised for its

"symbolic violence" (Archer et al, 2018) in that it reinforces socially bound

notions of ability and deservingness and can be interpreted as a technology of

social reproduction rather than an expedient way to allocate resources to

need. These studies come from different research fields, but both underline

the importance of peers and educational organisations in forming self-

concepts. Should we be looking at the social, emotional, and relational

aspects of children's school experiences to learn more about the connection

between mindsets and learning?

The last decade has seen a focus within education on findings from cognitive

psychology so that there has been less attention paid to the social and

relational in schools in a "striking denial of the dimension of learning as a

social performance" (Thoutenhoofd & Pirrie, 2015, p.72). In this contribution to

the debate around self-regulated learning the authors argue that:

> A reflexive social epistemology is a necessary counterweight to the
>
> systematic neglect of learning as a social process that has resulted
>
> from a psychological turn in learning theory. (Thoutenhoofd & Pirrie,
>
> 2015, p.72)

2.7 The question of identity for learners

Robins' (Robins, 2002) suggestion that real world research needs to focus on the individual, together with the intervention studies' findings that suggested social status and aspects of wider identity were significant, is leading to a question about the role of identity in relation to academic self-concept and to learning in

school.

There is a rich and varied literature about learner identities. This work sits in a broader range of literature dealing with identity formation, identity capital and individualisation. The study of identity processes has been undertaken by both psychologists and sociologists (Côté & Schwartz, 2002, Stets & Burke, 2000). Psychologists' identity theories have tended to approach the study of identity formation through the *identity status paradigm* which leads to a typology based on levels of maturity, self-regulation and social complexity. At one extreme *identity diffusion* describes an apathetic state likely to lead to dysfunction and academic failure whilst at the other end of the continuum *identity achievement* is regarded as highly mature, regulated, socially complex and balanced thinking (Côté & Schwartz, 2002).

Sociological approaches have focussed on social identity theory with its process of individualisation (which is quite distinct from the concept of individuation, whereby the infant establishes the boundary between herself and others). Individualisation describes a social process by which people develop a sense of their identity in response to being left by their society or culture to self-determine. Côté and Schwartz (2002, p.574) comment on the

29

agentic differences between those who lack sufficient identity capital and therefore select "default options" and those with high levels of identity capital capable of self-improvement within late-modern society.

Côté and Schwartz (Cote & Schwartz, 2002) investigated the link between the psychologists' identity status paradigm and the sociologists' individualisation theory and suggested that bringing the two frameworks together would benefit identity research and be more useful to social scientists and policy makers. In particular, they map out the common ground between the psychologists' mature and functionally complex Identity Achievement status, with its balanced thinking and mature interpersonal relationships, and the sociologists' "developmental individualisation" with its high degree of agency and deliberate growth. They are interested in social identity formation, particularly in the late-modern era when, "normative pressures seem to be pushing people to engage in more management of their social identities" (Côté & Schwartz, 2002, p.584).

Stets and Burke (2000, p.234) also examine the usefulness of combining identity theory and social identity theory to arrive at a general theory of the self, based on group and role identities, advocating a merger of identity theory with social identity theory to encompass the group as the basis for identity (who one is) with the role as a basis for identity (what one does). Like Côté and Schwartz, Stets and Burke identify common themes in the two approaches to identity theory, perceiving a difference in emphasis rather than in underpinning concepts. They do, however, stress that the individual's role

identity inter-relates with their group identity. "We suggest that being and doing are both central features of one's identity" (Stets & Burke, 2000, p.234).

As different fields converge on their understanding of common ground between theoretical approaches to identity there is also broad agreement that moves thinking from the view that identity is stable, fixed, and coherent to the understanding that it is, "socially negotiated, dynamic and fragmented" (Reeves, 2008, p.35). Similarly, Norton's work on identity and language learning draws on the poststructuralist depiction of the individual as, "diverse, contradictory, dynamic and changing over historical time and social space" (Norton, 2013, p.4).

To summarise, literature dealing with identity formation posits crucial key themes:

- There is an intense interplay between identifying as part of a social group and the categorisation of the self
- Identity formation follows a hierarchy or typology of identity "success", whereby sufficient resources, or capital, lead to complex and mature functioning of the self in relation to society and culture
- Identity is fluid: a dynamic and reflexive process responding to a unique set of connections, experiences, and resources

Educational research has built on the body of research into social identity to examine the impact of group-based identities on learners, particularly learners of second languages (Norton, 2013, Reeves, 2008). Norton maintains that,

Despite the best intentions, classroom practices can recreate subordinate student identities, thereby limiting students' access not only to language learning opportunities but also to other more powerful identities. (Norton, 2013, p.17)

Like many researchers looking at identity and learning, Norton is interested in the "othering" of students whose cultural or social group puts them outside the culture of the learning environment particularly in relation to second language acquisition. Similarly, Reeves's study of English Language Learners' experiences in the classroom leads him to advocate that, "Working to open a wider space for ELL's own self-positioning ought to be part of ...a school-wide initiative" (Reeves, 2008, p.40).

Whilst there is extensive work around identity and language learning, there is also a growing body of work on disadvantaged children whose positional identities can mean that traditional school environments are alienating (Rubin 2008, Stahl 2015). Rubin's sociocultural approach to learner identity in urban schools in the US looked at learning as "a process of identity construction" (Rubin, 2007, p.220), observing that teachers could create alien environments through narrow pedagogical approaches that privilege "smartness", race, and class. These environments are "figured worlds" in which identities form across individual classrooms and subjects and in which children from "other" backgrounds are positioned negatively in relation to learning. Stahl (Stahl, 2015) uses a framework based on Bourdieu's tools to explore identity in his

exploration of the underachievement of white working-class boys in the UK. He summarises that:

> In the educational experience, social and learner identities are intertwined and mutually constitute one another. The nexus between learner and social identities influences how identities become fixed and fluid, how resistance and conformity is fostered and how engagement and disengagement occur. (Stahl, 2015, p.60)

Thus, there is extensive literature around identity formation generally and around cultural dissonance in learning environments specifically. There is acknowledgement of the powerful impact that identity has on the learning experiences of those who are alienated from the social and cultural norms of the classroom alongside an understanding that learning has a reciprocal impact on identity, usually in the form of further alienation. What is happening around the identities of **all** learners though? There is a focus on learner identity for marginalised groups, and rightly so, but do we really understand how every child works out their sense of self during their education? Educators must understand what is happening for all the children they teach, whatever their starting point or background and for each child in school there are unique challenges and experiences that have profound effects on their identity formation and on their future selves. Rubin (Rubin, 2007, p.220)) asserts that "learning is a process of identity construction" and quotes from Wenger:

> Because learning transforms who we are and what we can do, it is an experience of identity. It is not just an accumulation of skills and

33

information, but a process of becoming. (Wenger cited in Rubin 2007, p.220)

To what extent is this process informed by self-concept? Or is self-concept informed by identity? Could it be that the relationship between identity and self-concept is dynamic and reciprocal? If, as Warin states "identity is not only the underpinning of wellbeing, it is also the lens through which we see and interpret the world around us" (Warin, 2010 p.32), then how does that lens offer children in school a view of their learning experience?

2.8 Understanding the mechanisms connecting Mindset with attainment

Repeated studies have shown that Implicit Theories of Intelligence are strong predictors of attainment (Burnette et al, 2013, Claro et al, 2016, Dweck, 2012, Costa & Faria, 2018) and work goes on currently to fathom out the factors and mechanisms, the "active ingredients" that link academic outcomes with self-theories. Burnette et al's meta-analytic review of implicit theories and self-regulation took Carver and Scheier's Self-Control Theory as a starting point to look at the links between mindsets, goals and achievement (Burnette et al, 2013). The review found that entity theorists tend to set performance goals then adopt maladaptive strategies like avoiding challenge and effort and self-handicapping. Their coping strategies are emotion focussed which leads to behavioural disengagement, which is what Dweck would describe as "helpless oriented strategies" (Dweck, 1999). Incremental theorists on the other hand adopt active self-regulatory strategies to support learning goals

that they have broken down into process goals so that they can be incremental. Their behaviour is positive, for example planning and seeking support: Dweck) calls these "mastery-oriented strategies" (Dweck, 1999). Figure 2.1 shows the cycle described by Burnette in which fixed-entity beliefs lead to negative outcomes.
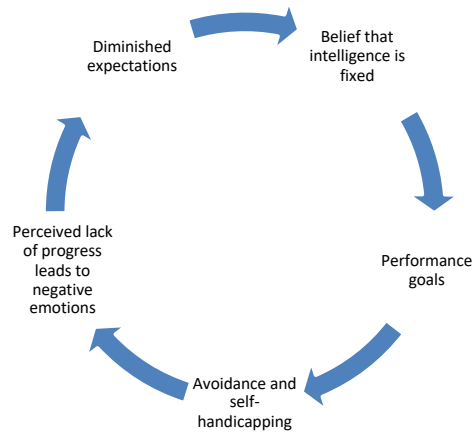
Fig. 2.1 An illustration of the negative cycle

Burnette et al suggest that the negative association of entity theory with performance goals is stronger when the goal is avoidance of appearing unintelligent rather than proving one's intelligence (Burnette et al, 2013). They also found that Implicit Theories of Intelligence are strong predictors of self-regulatory processes in the presence or absence of an ego threat. Effect sizes regarding attainment throughout the study were moderate, however, and only a "weak direct association" was found between implicit theories, self-

regulation, and achievement. Effect sizes appear stronger in non-academic domains like athletics or dieting. This is worthy of further consideration. What is different about academic learning goals and the goals set by athletes or dieters? Why is it so much harder to orient mindsets towards academic growth?

There is an interesting question to ask about the significance and complexity of goals in relation to implicit theories. Do implicit theories lead to growth goals – a striving for progress for its own sake and thus mastery-oriented - or is it the reverse? Do growth goals lead to incremental theories? Is the relationship top down or bottom up in other words, or is it reciprocal? Martin's 2015 study (Martin, 2015) asks about moving beyond an idea of a static state with regards to self-systems in order to look at a more dynamic relationship whereby processes in human functioning affect one another in a more complex interplay. Martin's findings supported a more bottom-up model so that growth goals were promoting incremental theories. Students who set themselves process goals like doing 20 minutes extra practice a day tended to move towards incremental mindsets rather than the other way around. This is interesting as it hints that interventions based on growth goals could be more effective than those aiming to shift mindsets, with all the difficulties inherent in trying to do that. The groups least likely to pursue growth goals were older students, males, disadvantaged students, and lower achieving students. Here we can see some congruence with other studies (Baird et al, 2009, Burns, 2007, Reinzo & Wolfe, 2015, Warren et al, 2019). Travers et al found that the setting of growth goals is helped when learners reflect on their

36

growth during the learning process (Travers et al, 2015). This study moved away from a quantitative approach and used diary accounts written by college students to create a "viewing window" through which to see the active ingredients or the inner working of the growth process.

To find out this interplay between self-theories, goal setting, self-regulation and achievement it could be helpful to investigate approaches that afford a look inside the so-called "black box" of individuals' learning (Haggis, 2002, Wiliam, 1998, Brockbank & McGill, 2007). This expression was used by Wiliam et al to describe the classroom:

> Certain inputs from the outside - pupils, teachers, other resources, management rules and requirements, parental anxieties, standards, tests with high stakes, and so on – are fed into the box. Some outputs are supposed to follow pupils who are more knowledgeable and competent, better test results, teacher who are reasonably satisfied, and so on. But what is happening inside the box? How can anyone be sure that a particular set of new inputs will produce better outputs if we don't at least study what happens inside? (Wiliam, 1998, p.140)

Wiliam et al were focussing in this study on the effectiveness of formative assessment in allowing light into the "black box". The study has led to developments in the use of assessment in classrooms in the US and the UK.

> The idea of the "black box" originated in literature centred on higher education. Authors like Brockbank and McGill picked up the metaphor to explain that they:

seek to open up the black box of process hidden in teaching and learning that we believe can, if made more explicit, promote learning more effectively. Within process lies a black box of significance, a repository of the often unexplained, unnamed, and invisible.
(Brockbank & McGill, 2007, p.76)

There are various suggestions in the wider literature around self-concept and self-efficacy that point to what could possibly be happening inside the "black box" of classrooms and indeed individual learners, for example Hattie (Hattie, 1992) and Bandura (Bandura,1997) highlight the importance of feedback, whilst Bandura's and Dweck's (Dweck, 1999)recommendation of mastery learning coincides with Burnett et al's depiction of a self-regulation cycle (Burnette et al, 2013). It will be interesting to see if these learning "mechanisms" are present inside the black box of the children in this study.

2.9 Inside the black box

It is possible, as a practitioner researcher, to speculate about these learning mechanisms. Experience in the classroom and access to EEF resources have enabled teachers to engage with concepts that are likely to be significant aspects of the learning process for secondary school children, namely motivation, metacognition, self-regulation, and feedback. These resonate with issues arising from the literature review and are thus worthy of further scrutiny.

Three of the interlocking mechanisms in the learning process which were observable in the interview data were motivation, metacognition and self-regulation. They appear together in an EEF guidance report (Education Endowment Foundation, 2017) and are presented to school practitioners as related concepts. However, they are distinctive concepts arising from distinctive fields of study.

The study of motivation is the earliest of the three concepts, dating back to the early half of the twentieth century when motivational psychologists had a rather Darwinian approach to the motors of behaviour (Weiner, 1990). Educational psychologists asked how to motivate people to engage with learning, and this shift to the cognitive aspects of motivation gave rise to theories based on interrelated concepts, for example, efficacy and control beliefs, goal-attribution, helplessness and social comparison (Urdan & Turner, 2007).

The term "metacognition" began to appear in the 1970s as researchers discussed the possibility of knowledge and understanding about the process of learning. Kuyper et al (Kuyper et al, 2000) describe metacognition as "controlling the learning process". In their evidence review for the EEF, Muijs & Bokhove outline the confusion that currently exists about what is meant by metacognition and conclude that, "metacognition is fundamentally associated with concepts such as monitoring, control and knowledge" (Muijs & Bokhove, 2020). The concept has developed so that there is often a distinction made between knowledge and regulation of cognition, with regulation combining

39

three components: planning, monitoring and evaluation, whilst later theorists stress the importance of domain-specific knowledge (Muijs & Bokhove, 2020).

Theories and models of self-regulation started to develop in the 1980s and, as McKeachie explains in his forward to Boekearts et al's Handbook of Self-Regulation, "Self-regulation constructs nicely integrate the cognitive, motivational, social and behavioural strands of theory and research" (Boekaerts et al, 1999, p.xxIII). The underpinning concept that makes self-regulation distinct from motivation is that it is the ability to respond to direction by adapting behaviour, emotions, attention, and cognitive strategies through activation, monitoring, inhibition or perseverance. Neuropsychologists point to the development of the prefrontal cortex as responsible for the development of executive function during adolescence (Moilanen, 2007). Self-regulation studies of adolescence inform programmes to reduce risky behaviour, parenting interventions and more recently to improve study habits. Educational psychologists have tended to focus on self-regulation as the control of learning behaviour and the use of learning strategies (Kuyper et al, 2000) (Education Endowment Foundation, 2017). During the study, I broadened out the definition of self-regulation within the learning process to include the work on attention and impulse control and the deferment of gratification that needs to happen before a learner can decide on their strategy and learning behaviours as these self-control issues were observable in the data. Whilst these three learning mechanisms identified in this study are distinct and have their own genesis within the field of educational psychology, they are nevertheless inter-related. Some studies view self-regulation as part

of metacognition, others see metacognition as an element of self-regulation with this latter view prevailing and forming the basis of the EEF's evidence review (Muijs & Bokhove, 2020). The review also makes the case for the role of motivation in self-regulation, suggesting that cognition, metacognition and motivation are all necessary components of self-regulation "with all interacting in the learning process" (Muijs & Bokhove, 2020).

2.9.1 Motivation for learning

Motivation is an extensively researched concept covering a broad range of human behaviours. As I have identified motivation as a possible key mechanism in the learning process, I need to focus on literature addressing motivation for learning, especially in schools. Achievement goals, Self-efficacy, Expectancy-value, Self-Determination Theory and Attribution Theory all highlight the importance of competency beliefs in motivating learners and recommend feedback that reveals the processes involved in mastery or the development of competence. There is a congruence between these theories and Mindset Theories, in that Dweck posits that a belief in the malleability of intelligence predisposes learners to mastery goals.

Urdan and Turner (Urdan & Turner, 2007) provide a helpful summary of theories of competence motivation in classrooms for practitioners. Their book chapter deals with motivations concerned with mastery in learning and starts with an observation that extrinsic rewards in schools are usually for behaviours and academic achievement rather than competence whilst social

41

motivation from peers and teachers can be helpful. They then list six different theoretical fields which contribute to our understanding of motivations to learn:

1. The first theory, Achievement Goals, is familiar as it appears in the work of Dweck and other mindset theorists. This framework posits that individuals have different purposes for engaging (or not engaging) with activities. Mastery goals represent a concern with developing competence whereas performance goals are related to achievement context and can result in performance-avoidance and self-handicapping. Achievement goal theory recommends classroom goal structures based on mastery or the development of competence.

2. Interest and Intrinsic Motivation Theory is based on the notion that human beings have an innate sense of curiosity and its proponents view interest as a component of motivation that is intrinsic and free of extrinsic coercion, resulting in individuals engaging for the sake of the activity itself. Urdan and Turner acknowledge that teachers cannot tailor their practice to the individual interests of all their students but do suggest catching and holding interest through their enthusiasm for the topic and through manipulation of the learning environment to enhance situational interest.

3. Self-efficacy, posited by Bandura (Bandura, 1997) places importance on learners' self-efficacy beliefs in that that they are more likely to engage and persist with learning activities when they believe they are capable of succeeding. Teachers are advised to use helpful strategies like helping students to set specific learning goals, teaching students when and how to use different learning strategies, modelling tasks and

processes for students and offering feedback on their students' use of strategies.

4. Expectancy-value theory states that there are two considerations at work for learners: their expectancy for success and the value placed by the students on the academic activity in question. These two considerations make distinct but complementary contributions to students' levels of motivation and performance. Teachers are advised to make activities authentic and meaningful, helping their students to discover how helpful the material can be to them. To promote competence then the advice mirrors that given by proponents of self-efficacy theory with teachers also being advised to create supportive classroom environments where students feel able to take risks with their learning.

5. Self-Determination Theory (SDT), the work of Ryan and Deci (Ryan & Deci, 2017) argues that intrinsic motivation needs three conditions, based on innate human needs: competence, autonomy and relatedness. SDT recommends that teachers take care to avoid damaging controlling behaviours, to give feedback that supports the development of competence, and to tend to the relational with affection, interest, time and resource devoted to students.

6. Attribution Theory is also a central focus for Dweck (Dweck, 1999)). The basic premise is that when students relate academic achievement to factors that they can control they tend to be more motivated than when they feel that the locus of control is external to them. Teachers

are urged to be very thoughtful about feedback, emphasising process, strategy and effort rather than the end result.

The theory that stands apart rather is Interest and Intrinsic Motivation. Murayama et al describe Intrinsic Motivation as,

"the internally generated rewarding process that is not dependent on extrinsic incentives" (Murayama et al, 2019). This particular area of motivation theory research is relatively recent, with researchers wrestling with the definition of concepts suggesting the importance of the emotional and affective dimensions of learning like *interest*, *curiosity* and *intrinsic motivation*. Peterson and Hidi (2019) suggest that curiosity is a response to a knowledge gap and has an inverse relationship with knowledge, whilst interest is a sustained focus on a domain that can withstand complexity and has a linear relationship with knowledge. They suggest that the terms interest and intrinsic motivation can be used interchangeably. In an earlier paper, Hidi and Renninger (2006) put forward a Four-Phase Model of Interest Development:

1. Triggered situational interest
2. Maintained situational interest
3. Emerging individual interest
4. Well-developed individual interest

They describe interest as a motivational variable with three distinct features: the affective and cognitive interact, it has biological roots in seeking behaviour- whereby a living creature needs to find food sources- and it involves an interaction between person and content. They link interest or intrinsic motivation to the other motivation theories when they assert that levels of effort, self-efficacy, goal-setting and self-regulation differ with each

phase of their model and increase or decline with increasing or waning interest in a domain. They say of educators:

> They do not have a clear understanding of their potential role in helping students to develop interest. In fact, teachers often think that students either have or do not have interest and might not recognize that they could make a significant contribution to the development of students' academic interest. (Hidi & Renninger, 2006, p.111)

2.9.2 Metacognition

Metacognition has been recommended to the teaching profession by Alex Quigley), writing for the Education Endowment Foundation in his report on Metacognition for learning in schools (Education Endowment Foundation, 2018). First described by Flavell in 1979 as the experiences and knowledge we have about our own cognitive processes, the application of metacognition theories to education became more apparent with Nelson and Narens' work on monitoring and control (Nelson & Narens, 1994) with the assertion that if control processes exist, if learners can make decisions about their learning based on their understanding of how effective their strategies are, then these same control processes can be altered or adapted to improve the effectiveness of learning (Schwartz & Perfect, 2002, Rhodes, 2019).

Son and Schwartz examine the evidence for the relationship between monitoring and control, suggesting a greater degree of complexity than early assertions, for example by Dunlosky and Hertzog in 1998, that learners are

likely to make decisions about time investments based on the need, or norm of study, and will spend longer on the most difficult to learn topics (Son & Schwartz, 2002). Later suggestions in this field are that there could be a higher order strategy selection process based on the learner's interpretation of expediency and influenced by motivation and rewards. Son and Schwartz highlight the importance of a competent level of metacognitive control and self-regulation in creating successful learners but ask if it is even possible to teach these skills to children, quoting Vygotsky: "in order to subject a function to intellectual and volitional control, we must first possess it" (Son & Schwartz, 2002, p.32).

One of the main ways learners in secondary schools exercise metacognition is through memorisation. In its 7-step model to encourage schools to develop metacognition in learners the EEF focuses in on learning well independently by looking at General Certificate of Secondary Education revision (Education Endowment Foundation, 2018). The model relates metacognitive processes like adopting powerful strategies, monitoring performance and self-evaluation methods to revision scenarios. Teachers are accessing research to support the development of effective memorisation techniques in order to support pupils' GCSE performance and in the last 5 years there have been a plethora of resources produced for teachers that focus on the role of memory in learning cited in the EEF guidance report. These include texts about spaced practice, interleaving and retrieval practice all of which use cognitive psychology to explain how information is stored in long term memory so that it can be retrieved when needed. There has also been interest in cognitive load

theory whereby too much new information overloads working memory to create barriers to learning especially for pupils with poor literacy or low prior attainment (Education Endowment Foundation,2018,p.29). There are two

different and perhaps conflicting imperatives behind this interest in memory in schools. One is the importance of schema building in learning, by which understood and remembered concepts form a web of ideas and language in the memory to which new learning can be added (Fulbrook, 2020). This is a model of learning that treats the acquisition of new knowledge as intrinsically valuable. The second imperative concerns the act of remembering information in order to do well in tests and examinations. As there is pressure on students, teachers, and schools to achieve highly in examinations this latter imperative tends to dominate on schools.

2.9.3 Self-regulation

It is interesting to see Son and Schwartz (Son & Schwartz, 2002)) make a link between metacognitive competence and self-regulation in their description of the conditions for the successful application of metacognition in learning. Quigley et al also link metacognition to self-regulation in his EEF report for teachers (Education Endowment Foundation, 2018) The study of self-regulation has focussed on self-regulation failure, described by Baumeister et al as, "the major social pathology of the present time" (Baumeister et al, 1994). They describe self-regulation as an essentially human ability to, "exert control over one's own inner states, processes and responses" (Baumeister et al, 1994 p.6) and suggest that it is a broader

concept than self-discipline or self-control, as its essential element is the ability to over-ride responses, impulses, and behaviours. They refer to Carver and Scheier's model of a hierarchy suggesting that self-regulation is a process whereby higher processes, such as self-stopping or deferring gratification, over-ride lower processes, such as acting on impulse or being distracted, and highlight the importance of feedback loops in theorising about self-regulation with their essential elements of standards to provide the parameters and monitoring to judge effectiveness of operations against those standards. Interestingly, it was Carver and Scheier's model that gave rise to Burnette et al's research into goal setting and monitoring as a potential mediator between mindsets and academic growth (Burnette et al, 2013).

Self-regulation theory has wide social relevance and is applied to addiction, violence, crime and social disfunction as well as education. Baumeister et al set out a range of mechanisms that can lead to self-regulation failure:

1. Conflicting standards – which lead to obvious confusion. They cite the example of a child with two authority figures who disagree about the rules.
2. Reduction of monitoring -in the case of adolescents this can arise from feeling submerged in a group of people -called the paradox of deindividuation.
3. Strength failure – arising from a reduction in willpower, or temporary tiredness, perhaps due to stress, or the strength of the impulse.
4. Psychological inertia – the longer you do something, the harder it is to stop.

5. Abstinence violation effects – for example in zero-tolerance regimes where there is no coming back from an early mistake.

6. Renegade attention – managing attention is a significant factor in self-regulation and considered to be the most generally effective technique.

   (Baumeister et al, 1994)

Educators will recognise many of these problems in the pupils who are struggling with their learning and behaviour in school. Schools ask a lot of children by expecting them to be self-regulating whilst educating them alongside their peers and often giving them rules that conflict with their cultural norms.

2.9.4 Feedback

In England, schools were required to implement Assessment for Learning strategies with an emphasis on the importance of formative assessment, in particular feedback, the term Wiliam and Black used to describe formative assessment used to modify teaching and learning activities (Wiliam, 1998). It has been suggested, however, that the evidence for the impact of formative assessment on achievement and was weak and had led to vulnerable and unproven practices leading straight to policy (Dunn & Mulvenon, 2009). This analysis examined the use of the terns formative and summative assessment before recommending the use of "formative evaluation" to describe assessment practices that were helpful to process rather than summaries of outcomes and citing Stiggins from 2002: "If we are finally to connect

49

assessment to school improvement in meaningful ways we must come to see assessment through new eyes" (Dunn & Mulvenon, 2009).

The teaching profession was urged to attend to feedback again when Hattie's book, "Visible Learning", written for educators and accompanied by a series of conferences for teachers, re-introduced its importance (Hattie, 2009) This meta-analysis assessed the impact of various school improvement interventions and practices before concluding that feedback had considerable potential to improve learning. Conceptualising feedback as "information provided by an agent regarding aspects of one's performance and understandings", Hattie and Timperley develop the idea that:

> feedback is information with which a learner can confirm, add to, overwrite, tune, or restructure information in memory, whether that information is domain knowledge, meta-cognitive knowledge, beliefs about self and tasks, or cognitive tactics and strategies". (Winne & Butler, 1994, cited in Hattie & Timperley 2007)

They advise that feedback can be accepted, modified, or rejected by learners and can be detected almost subconsciously. Hattie and Timperley present a model to explain effective feedback, basing it on the answer to three questions:
1. Where am I going? – feeding up
2. How am I going? – feedback
3. Where to next? – feed forward

They then outline four levels on which feedback operates: task level, process level, self-regulation level, and the personal level. The self-regulation level has the most potential to move learners on as it involves monitoring, directing, and regulating learning activities and needs a combination of self-assessment and metacognitive capacities, together with a sense of self-efficacy in order to have impact:

> When students have the metacognitive skills of self-assessment, they can evaluate their levels of understanding, their effort and strategies used on tasks, their attributions, and opinions of others about their performance, and their improvement in relation to their goals and expectations. They can also assess their performance relative to others' goals and the global aspects of their performance. (Hattie & Timperley, 2007, p.94)

2.95 Summary of literature on learning mechanisms

Each of the learning mechanisms reviewed in the literature above belong to distinct sub-fields of psychology or educational research but it is possible to see overlaps and links between them. They all refer to the importance of self-efficacy for example. Metacognition needs motivation, and so does the acceptance of feedback, which in turn needs learners to be metacognitively capable and to have the capacity for self-regulation. It will be interesting to see if there are indeed links and overlaps between these elements in the lived experiences of the students in the cohort.

2.10 Literature Review Conclusion

There are unanswered questions about mindsets. The literature identifies social and relational influences which could be significant to the creation and impact of mindsets on learning and there is some urgency to look closely at the wider contexts in which mindsets operate as the tide of opinion is turning in education. There is a danger that a valid and important theory is rejected by the teaching profession because it does not fare well in efficacy trials. Could a more complex and holistic understanding of the role played by Implicit Theories of Intelligence, one which considers the emotional, relational and affective dimensions of school and social constructs as well as identity, help to improve the life chances of learners in schools?

Dweck's Growth Mindset theories have played a significant part in shifting an important emphasis in educational thinking. There is more acceptance now that intelligence is not fixed, and that academic growth is possible through effort and a focus on mastery. The educational accountability system in England is predicated on the notion that schools can create added value to their students by measuring the progress they make above a predicted trajectory from a baseline score. There is persuasive experimental data to suggest that a learner's Implicit Theory of Intelligence does have an impact on their academic outcomes and wellbeing (Dweck, 1999, Blackwell et al, 2007, Claro et al, 2016).

It has been difficult to convert these findings into interventions that create sustained improvements in learning, however. One-shot interventions on which trials have relied to date have had some limited success with certain groups but have not been able to counteract issues beyond implicit intelligence theories, for example learning difficulties, social class or gender and have not been able to create sustained improvements. Later researchers who have trialled interventions have pointed to complexities around the cultural norms of classrooms, families and social groups, and wider issues around identity as important factors in changing mindsets and have suggested that studies look at individuals over time in naturalistic studies in order to discover more about why it is so difficult to challenge fixed entity thinking and re-orient learners from helplessness patterns.

Growth Mindsets are part of the wider study of self-concept. Whilst researchers have isolated academic self-concept, to discover the importance of frames of reference and subject specificity for example, this sense of self for a learner is part of a much broader sense of their attributes based on family, peers, gender, and social status. Observations about the impact of the self-system on attitudes to school and on learning suggest that membership of social groups, placing different values on education, impacts on self-concept. A review of literature around identity formation, particularly in relation to learning, suggests a certain amount of congruence with theorising around self-concept. Both identity and self-concept develop dramatically during adolescence, both are influenced by external factors such as family, peers and social grouping, both offer a sense of the self. Self-concept is described

as a view of one's attributes, however, whereas identity is described as a dynamic and responsive process reacting to experience. Latterly, the literature on identity has pointed to a development process that happens through learning - learning as becoming. Whilst there is a growing body of work around the impact of marginalised identities on education, there is little written for educators around the issue of identity and the classroom. If children bring their emerging identities into the classroom, along with their ideas about their attributes within both global ad academic self-concepts, then what happens for them as they encounter teachers, peers, subjects and assessments?

Literature on learning in Higher Education gives us the metaphor of the "black box". Taken up by researchers into earlier education phases the metaphor suggest that there is a process that takes inputs and turns them into outputs when learning happens. If we treat identity, self-concept, and implicit intelligence theories as the inputs, can we gauge what happens to individual learners to create the progress, growth and career pathways that are the outputs? The literature points us to self-regulation, motivation, feedback, and guided mastery as elements of successful learning. How do these mechanisms work in response to individual learners' unique identities, self-concepts, and mindsets?

This study explores unanswered questions about the relationship between identity, self-concept, Implicit Theories of Intelligence, and academic growth in the educational journeys of secondary school children. There is undoubtedly a

significant correlation between mindset and school outcomes, but trials have struggled to effect sustained improvements by adapting mindset theory for the classroom. So far, no study has looked at Implicit Theories of Intelligence in relation to the complex lived experience of school over time. This study aims to explore that experience to further understand that complexity and to provide insights for educators.

Chapter 3 Methodology

3.1 Establishing a paradigm

This study aimed to find out more about how Implicit Theories of Intelligence function as part of wider self-concepts and identities, to probe the extent to which Implicit Theories are complex rather than binary and to examine the interplay between those Implicit Theories, a teenager's experience of secondary school and their eventual outcomes. The investigation hoped to refine our understanding of Mindset Theory so that we can respond to it helpfully in schools. Is a child's Implicit Theory of Intelligence constant across all the learning activities that the child encounters? What is the connection between mindsets and school outcomes and what are the active ingredients or mechanisms within that connection? What other factors interact with mindsets and what can we discover that might be useful to educators?

Mindset theory arose from an experimental approach, compatible with ontological realism, in which learners' Implicit Theories of Intelligence scores were ascertained using a Likert scale before progress was measured usually in terms of success in problem-solving activities. This positivist paradigm underpinned a set of Department of Education funded, randomised control trials to test the efficacy of interventions including Growth Mindsets (Churches, 2016) and I had initially accepted that I would continue to investigate Mindset Theory through experimentation and measurement. However, I approached the issue of Implicit Intelligence Theories as a school-based practitioner with a range of questions about the formation of Implicit Theories of Intelligence, the complexity of the learning experiences of children in school, and the efficacy of the positivist testing of single interventions when

set against the heterogeneity of the classroom and recognised that I was therefore bringing a relativist viewpoint to the investigation of mindsets, interested in the experience of individual learners and open to the search for subjective, contextual meanings rather than a single truth. My research paradigm was increasingly informed by a constructivist epistemology as I searched for the meanings that the children and parents in my study created from the experience of school. During the study, as I developed as a researcher, my search for school experience meanings became stronger and I was able to see the tensions and contradictory meanings within the answers to questions about how they understood learning and intelligence and to see how their understanding changed over time. There was an inductive element to the approach as the in-depth interviews yielded key themes in the qualitative data that were unexpected and informed an adjustment in the approach to investigate the parental contributions to learning rather than the contributions made primarily by teachers.

As the study took shape, and I made the decision to investigate the experiences of students in my own school, I also wanted to explore the issues for school leaders conducting research in their schools and wanted to be able to include that learning as part of the study. I say more about this aspect of the study below. I was a practitioner researcher, and my starting point was one that I had already brought to bear on the literature around mindsets: that each child is unique; that their sum of experiences accompanies them through the classroom door each day and is added to by what happens in that classroom; and that each child constructs a reality for themselves in response

to those experiences. This makes learning a highly complex, individualised process about which it is very difficult to generalise. My experience of school improvement work has suggested that no one intervention is capable of improving academic outcomes for most, let alone all, children in a cohort because there are so many variables, some of them - parental mental illness, domestic abuse, or parental illiteracy for example - hidden from the practitioner's view. Because of this lack of heterogeneity in student populations, improving outcomes for children in school is often an "aggregate of marginal gains", to borrow a phrase from the GB Olympic cycling team. I needed to consider the multiple, socially constructed realities of learners and take into consideration the dynamic reciprocal nature of their educational experience over time. Whilst various forms of progress and attainment data are readily available to professionals working in schools, a more interpretive approach was needed to probe the "how "and "why" of mindsets and children.

The imperative to approach the issue in a more interpretivist way is suggested in the literature for example when Dweck called for increased understanding about, "the contexts that foster beliefs and goals that create growth" (Dweck, 2015) and questioned the usefulness of "big data" when exploring Implicit Theories of Intelligence, whilst Robins et al stressed the importance of focussing on the individual in real-world research that had, "greater ecological validity" (Robins, 2002). The movement away from one-shot laboratory interventions towards the longer-term gathering of qualitative data has the potential to allow insights into the complexities of learners' beliefs in terms of how they seem to form and how they influence their experience of education.

Whilst it is helpful for practitioners to understand the impact of interventions like malleability priming in terms of effect size determined by trials (through short courses explaining how brains "wire and fire" for example), the whole issue of what kind of research is helpful to educators is contested in the so-called "paradigm wars" being fought in educational research. There is an increasing tendency for policy makers to believe in the superiority of quantitative methods to the extent that the Education Endowment Foundation (EEF) was set up to oversee efficacy trials, based on Randomised Control Trials (RCTs), and publish the findings in terms of months' progress, cost, and validity. The EEF is, however, keen to say that their quantitative data should be a starting point for schools who need to contextualise these findings skilfully, harnessing qualitative methods to probe how and why interventions do - or do not - work.

Similarly, in response to 21st century emphases on medical style efficacy studies, Biesta describes education as a reciprocal and dynamic process not always best served by the apparent "gold standard" randomised control trials:

> apart from the obvious fact that the condition of being a student is quite different from that of being a patient — being a student is not an illness, just as teaching is not a cure — the most important argument against the idea that education is a causal process lies in the fact that education is not a process of physical interaction but a process of *symbolic* or *symbolically mediated* interaction. If teaching is to have any effect on learning, it is because of the fact that students interpret and try to make sense of what they are being taught. It is only through

processes of (mutual) interpretation that education is possible. (Biesta,

2010, p.8)

It is this process of interaction and interpretation that lies at the heart of this

study's questions about the interplay between identity, self-concept, and

learning.

In order to explore research questions about the formation of Implicit Theories

of Intelligence, the possibility of their complexity and the ways that these self-

theories react to the lived experience of school, I needed to hear from

learners and their families in detail and over a significant period of time whilst

tracking their progress in school. I was interested in the work of Andrew

Pollard who supported the idea of the practitioner researcher able to,

"focus on understanding the complexities of the individuals, variables and

interactions that are essential components of education communities and

institutions" (Hamilton & Corbett-Whittier, 2014, p.17). Pollard constructed rich

longitudinal case studies that allowed him to examine the major social

influences on the learning process itself, embracing ethnography as his basic

methodology. Warin also used longitudinal qualitative research to investigate

the self-stories of children and question the notion of infant determinism.

Warin's very long qualitative study afforded insights into the important

contribution this emergent methodology could make, "to theoretical

understandings of the change occurring over the lifespan and to policy on

child wellbeing" (Warin, 2010).

Having established that an interpretivist assumption was leading to a

constructivist or even subjectivist ontological viewpoint whereby multiple

realities are socially constructed and would be best understood through interactional investigation, I needed to design an ethnography-influenced approach in order to reach a more distilled and sophisticated understanding of the role played by mindsets in the learning of individuals.

3.2 Longitudinal, qualitative ethnography-influenced research through nested case studies

The last 20 years have seen the development of some ambitious longitudinal qualitative studies, for example Pollard's Identity and Learning Programme (Pollard, 2007) which contributed to the evolution of this type of research in the field of education. Pollard quotes Holland's observation that the study, "yielded insights into the complex processes through which learning takes place" (Holland et al, 2004 quoted in Pollard, 2007). Pollard observed that the approach, whereby his team followed the experiences of 17 children from the age of 4 years through to when they were leaving compulsory education aged 16 years, allowed him to stay close to learners and that the research design, based on longitudinal ethnography had, "potential for investigating the dynamics of pupil learning and career trajectories" (Pollard, 2007, p.3).

The Irish Post-Primary Longitudinal Study followed a large number of pupils from 12 different secondary schools to look at the long-term impact of transition and the variation in secondary school approaches (Smyth, 2014). Whilst the study's findings confirmed common sense predictions about transition, Smyth was able to report new findings, relating to the importance of

the second year after transition "which would only have been possible given the longitudinal nature of the study" (Smyth, 2014, p.12), and reflected that, "te study allowed us to unpack the processes behind what we knew already" (Smyth, 2014, p.12).

Both of these major studies looked at the lived experience over time of children in education in order to deepen an understanding of observable phenomena. I also wanted to look at students' experiences over time to see if I could dig deeper into the interplay between their mindsets and their learning journeys. I needed to work out a way to use the data I was able to collect, including interviews, in order to do that. These major studies used surveys, questionnaires, school data and interviews to create detailed longitudinal ethnographies. They also had to contend with practical constraints like school routines and the business of people's lives, whilst being open to new directions during the study. I needed to be reflective and ready to adapt my thinking and my methods as the study continued. In their 2015 paper, Thomson and McLeod highlighted the significance of the time perspective allowed by longitudinal qualitative research, drawing attention to, "an ontology of "mattering" in which the past is apprehended from an evolving present" (Thomson & McLeod, 2015, p.246). This is interesting in educational research, as we do need to look at learners' past experiences in order to try to understand their impact on the present and see how they project forward into the future. This is a different perspective to the one afforded by the efficacy trial approach so often advocated as the educational gold standard. Longitudinal qualitative research is complex and makes demands on

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62

researchers, who need to be at ease with doubt. It is also an iterative process of looking backwards and forwards in time in an analysis that is,

"always a provisional form of making sense - for the story is by definition, not yet over" (Pollard, 2007, p.12).

Whilst I could only follow the lives of my participants over three academic years, I still needed to pay attention to temporality and to also find a way to manage the multi-dimensional and complex structure of the data I was collecting. I found the approach described by Vogl et al helpful in that it described a two-dimensional approach to analysis across participants and then longitudinally within individual narratives (Vogl et al, 2018). This simple framework, set out in Table 3.1, gave me a structure that would be helpful in shaping the study.

	Individual cases	Across cases
Cross-sectional	a) • Case profiles • Provisional codes and categories	b) • Expansion of coding scheme • Criteria for comparison • Typology •
Longitudinal	c) • individual trajectories • provisional categories for change (timing,	d) • types of change and underlying dynamic

	structure and causes of change)	• criteria for longitudinal comparison • clusters of types of participants, types of change, and process of change

Table 3.1 Dimensions of comparisons in qualitative longitudinal research and related aims (Vogl et al, 2018, p.181).

The literature I was reviewing around methodology directed me to the potential of case studies as a central approach to investigating the dynamic between mindset and lived experience of learners in secondary school. Interestingly, case study came to prominence in education research as a reaction against a dominant positivist model in the 1970s when proponents like Lawrence Stenhouse (Stenhouse, 1978) argued for its effectiveness in achieving greater understanding within education communities. A debate about whether case study is a method, genre or approach has continued since the 1970s, as summarised by Hamilton and Corbett-Whittier in their guide to case study in education research: for example, Stenhouse felt that case study findings needed to be verifiable whilst Robert Yin (Yin, 2009) characterised case study as a method, identifying three forms of case study: exploratory, descriptive, and explanatory, attempting to impose quantitative standards of validity on case study research. Sharan Merriam (Merriam, 1998) also described three types of case study: particularistic, descriptive, and heuristic, heuristic studies being able to increase understanding of a

phenomenon. Robert Stake (Stake, 1995) emphasised the need for each researcher to redefine case study according to what they are learning through the process (Hamilton & Corbett-Whittier, 2014). Pollard (Pollard, 1996) used case study in longitudinal ethnography in order to understand more about the nature of learning, making use of multiple perspectives and multiple forms of data collection to produce rich accounts of children's experience and pointing the way forward for practitioner research to focus on,

> understanding the complexities of the individuals, variables and interactions that are essential components of education communities and institutions. (Hamilton & Corbett-Whittier, 2014, p.7)

Case study, like qualitative longitudinal ethnography is thus an emerging research method, still contested, still developing but with considerable potential for educational researchers wanting to understand more about complexity and the interplay between individuals and systems like education. If I were to discover more about how Implicit Theories of Intelligence form, how they work across the curriculum and over time for individuals, and whether there is anything generalisable to be learnt that would help educators to be more effective in their practice, then case studies of a group of learners, as part of a qualitative, longitudinal ethnography-influenced study, would be the most likely way to uncover additional understanding. Whilst the study is a response to Dweck's psychological theories, it is educational research and is a composite approach drawing in sociology, cognitive science, psychology and politics. The skill for educational researchers lies in synthesising these

different approaches to theory and evidence into an understanding that can impact positively on the lived experience of children.

3.3 Head teacher as researcher

3.3.1 Deciding to research in my own school

I had two aspirations in mind throughout this study: one was to delve deeper into the issue of mindsets to discover insights into the complex processes through which learning in a school takes place. The second ambition was to contribute to the research space that was opening up within the teaching profession itself.

Practitioner research is another contested area, affected by the "paradigm wars" which pits the RCT against qualitative methods, but also influenced by policy, the role of academia and the status of teachers in schools. The last decade has seen a response in terms of government policy to Ben Goldacre's "blueprint" for practitioner research which argued for positivist, quantitative research based on RCTs to inform educational practice (Goldacre, 2013). The government set up the EEF in order to quantify the efficacy of interventions and programmes as part of its "What Works" agenda and launched a very large scale RCT project testing the efficacy of six commercially available interventions to combat disadvantage: Closing the Gap: Test and Learn (Churches, 2016). As part of this large-scale project teachers were also encouraged to undertake small scale experimental RCTs in their settings and

advised that if the trial was well constructed it had validity and generalisability. The results of this unprecedented project were disappointing but not surprising for the teachers taking part. The interventions had no more impact in terms of progress than "ordinary good teaching", apart from a primary phase mathematics resource. One of these interventions was Growth Mindsets, and that is what piqued my original interest in Implicit Theories of Intelligence and led to my undertaking this study.

Whilst this was useful in highlighting the importance of "just good teaching" and downplaying the claims that there could be a quick fix sitting on the shelf ready to implement, it rather undermined the excitement around RCTs generated by Goldacre's paper (Goldacre, 2013).The experiment ended there, without publicity or fanfare, and nothing on this scale has been attempted again, although the EEF continues to use the approach in its investigations into "what works" in education and there followed a movement to urge schools to adopt practice that was evidence-led, then evidence-based, and eventually evidence-informed. That amelioration in the expression tracks a gradual tailing off in terms of the energy and resource put into engaging practitioners with research. Or perhaps it is fairer to say that it has been concentrated into the EEF's Research Schools programme, whereby schools in areas of deprivation have been designated as research hubs in order to disseminate the findings of EEF investigations and to support their implementation in surrounding schools. In terms of national policy, the positivist paradigm endures.

An interesting aspect of the "Closing the Gap" study (Churches, 2016) was the impact it had on teachers as researchers. As one participant explains, 'I feel it's brought it back down to classroom level for me. I never used to read educational research as it seemed far too removed from what I was seeing on a daily basis – this has changed my perception'(Churches, 2016, p.58)

The report called for teachers to be more informed about research methods and to have improved scientific literacy, and whilst it prioritised the positivist, quantitative paradigm, there is nevertheless an important truth here. Research into education is something that usually happens outside schools and at a remove from the practitioner. Teacher training still does little to explore research paradigms or methods, and there is much reduced capacity in schools to allow access to professional development, let alone access to opportunities to understand educational research. As schools have had their funding reduced, teachers have experienced larger classes and increased contact time and there is rarely sufficient underspend on essentials like salaries to allow for a Professional Development budget. What little time and money there is available for staff training – and it tends to be training rather than development - goes on issues that are urgent. In recent years for example, schools have focussed on safeguarding, mental health, preparing for new GCSEs and A levels and adapting to new Ofsted Frameworks for Inspection. School leaders have had to prioritise their school's place in the league tables or their Ofsted judgement over any profound approach to teacher development and can be forgiven for looking for the solutions offered

by the "what works" approach rather than asking profound questions about the experiences and learning of the children in their care.

Meanwhile, any alternative to the positivist paradigm most often happens at a remove from the classroom and there continues to be a disconnect between practitioners and academics. There is little encouragement for practitioners to conduct research beyond the parameters of the "what works" agenda and there are few established channels of communication between teachers and academics over what is researched and what is understood. Goldacre wanted engagement with positivist research to be enlightening for teachers:

> This is about empowering teachers, and setting a profession free from governments, ministers and civil servants who are often overly keen on sending out edicts, insisting that their new idea is the best in town.
>
> (Goldacre, 2013, p.7)

For teachers and school leaders, however, the question "what works?" needs not only to lead to the follow up "how and why does it work?" but also to the question "why do we need this to work?" if we are to be set free from government edicts.

In his book, "Teachers as Researchers", Kincheloe criticises Western education which, "in this globalised age of mediocrity devolves into an effort to make students competitive in the cold new economic order that faces them" (Kincheloe, 2012, p.3) and yearns for:

> the possibility that self-directed teacher professionals might research school atmospheres, the communities surrounding schools, student

> needs, the disciplinary and counter-disciplinary knowledges
>
> constituting the curriculum…..Informed by these understandings, such
>
> teachers as researchers could better develop and implement a
>
> curriculum connected to the vicissitudes and exigencies of their unique
>
> situations. (Kincheloe, 2012, p.5)

Kincheloe sees research as the agency needed by teachers to design the learning their students in their communities need.

I wanted to see if I could do that in my own school. Could I conduct a study within my own school that would inform my community of practice sufficiently for us to work together differently with new understanding? I had additional dimensions to add to this question: could a school leader conduct research in their own school that allows for this level of enlightenment? What would being a researcher bring to their leadership and to their school?

When I first started to ask questions about Implicit Theories of Intelligence and to think about designing my study, there was an assumption that, in order to circumvent ethical dilemmas, and to remove the potential for bias, it would be better to conduct research in a school or schools other than my own. As I read on about methodology and discussed the study I realised that simply researching in another school would do little to reduce any bias arising from my role as a local school leader and from my practitioner experience to date: that was something I had to counter consciously during my work. I also realised that the study had the potential to tell me profoundly important things about the lived experience of children in my school and I felt that as a school

leader I needed the openness and humility to listen to their voices and interrogate my own practice in relation to what I discovered. This was going to be a personal journey and I was ready to embrace that.

3.3.2 Reflexivity, mindfulness, and ethical dilemmas

Before designing the study, it was important to resolve the issue of my researching within the school where I was a senior member of staff. This ethnography-influenced study would involve, amongst other activities, the use of school data on individuals' academic and personal progress, data collection activities with wider groups of pupils, interviews with pupils and parents and the inevitable gathering of information afforded someone with such a role in school. My role as Head of School in the established academy, and later Principal of the new Studio School where six of the participants were enrolled, was therefore a very important ethical issue to consider from the outset. When I first started to address the issue I asked, "*Should* I conduct research in my own school?" Having thought about the uniquely privileged position of a situated ethnography-influenced researcher working with children, their teachers and their families I started to ask, "*Shouldn't* a head teacher *be* a researcher in their own school?" I was increasingly interested in using the opportunity to undertake research in my school as a way of learning about what this does to enhance a head teacher's understanding of their school and their pupils' needs whilst developing their school leadership skills and educational vision. I could not change my professional role - or the responsibilities that gives me with regard to the community I serve - but

maybe I could turn the apparent obstacles to ethical practice and objectivity into positive factors.

A review of relevant literature highlighted the need for reflexivity. Harding suggests that "strong objectivity" needs "strong reflexivity", and that "socially situated knowledge" is a "socially situated scientific resource". It is perfectly valid to research a community from within but there are caveats. She stresses the importance of "starting off thought" from the lives of marginalised peoples and of the researcher being "integrated into democracy-advancing projects" (Harding, cited in Alcoff,1993). The head teacher-researcher is immediately challenged by Harding's depiction of reflexivity. In one way or another, all the participants in the research are marginalised, particularly within the context of the unequal power structures that exist between a school head and pupils, staff and parents, although this is far from straightforward. The crucial issue here is the acknowledgement and management of those relationships so that knowledge is not compromised and so that participants are not harmed. The second issue is bound up with the motivations and intentions of the head teacher-researcher. It is important that the research aims are consistent with the advancement of democracy: in school terms, this entails the advancement of "pupil voice" so that children not only give genuine viewpoints during the research itself but also see that the research outcomes will benefit a much wider group both in their own school and further afield.

It is important to consider that as head of a school there are dangers in "critically unexamined" social situations, leading to an "Inability to generate the

most critical questions about received belief" (Alcoff, 1993). If a researcher-head teacher is to go in search of objective truths then there is a need for them to be so strongly reflexive that they are aware of the limitations of their viewpoint and that their very presence, as an embodiment of socio-cultural dominance, may only serve to reproduce received beliefs about what is culturally valuable within their school communities. This is certainly a challenge for the researching head, but is this truth-seeking and profound reflexivity not also liberating and ultimately helpful to any school leader who believes there is a way for education to genuinely counter disadvantage?

Reflexivity in school-based research depends significantly on the placing of children within the discourse. Mauthner discusses the issue of whether studies of children consist of research *on* children or *for* children and argues for a "child-centred approach to data collection" (Mauthner, 1997). She is keen to equalise the "power relations" between researcher and child and advocates reflexivity, responsiveness and open-ended research goals and methods. Methodology is therefore underpinned by allowing children to set their own agenda and to talk about their daily lives and views, and by being aware of the children's experiences of the research process itself. This is not very different from the naturally occurring opportunities to talk in this way with children that form part of teachers' daily lives. What is different is that, whilst the information to which an educational professional is privy is confidential, in the research process this information is transcribed, processed as data, and is reported to a wider public, albeit under the cloak of anonymity. The children and of course their teachers and parents - must consent to this and thus there

could be reticence to share personal information, compounded by a reluctance to share any information that would colour my view of them. I needed to be ever mindful of this when I was asking myself what and how I know. I also needed to be vigilant for the signs of concern or distress following any sharing of personal information or views.

It is this "ethics in practice" that Guilleman is suggesting when she asserts that reflexivity could be a tool for ethical research practice (Mauthner, 1997). She uses Komesaroff's expression "micro-ethics" to explain that ethics is actually an ongoing process beyond the procedural and is what should happen in every interaction. Whereas Mauthner describes the re-positioning of the *object* of research to *subject*, Guilleman moves to the notion of *participant*. She is at pains to point out that the potential harm to participants in ethnographic studies is a subtle, emotional issue. When I considered the duty of care integral to the role of educator and the training and experience that a school leader has to draw on then I did feel assured to a certain extent that having this as a first priority in every decision I made should be helpful. I already thought carefully about interaction with children in my care and was ready to pick up on signs of distress or unhappiness: Guillemin and Gillam's "ethically important moments". Further to this, training and experience in safeguarding is an additional ethical security: any hint that a child is at risk of harm in any way, including emotionally, is dealt with by clear protocols that are woven into the school environment. These school-based issues also needed to be clearly articulated as part of the ethical process.

Warin develops the notion of ethics as a continuous process, supported by reflexivity as an ethical tool when she describes a state of "ethical mindfulness" (Warin, 2011). She advocates linking, "sensitivity to self and sensitivity to others through a value for relational awareness," and provides a useful set of guidelines which I adapted for my own study. I hoped that learning to do this would help me not only to conduct useful research but also to become a better school leader.

Practical steps to support "ethics in practice" in my research included:

- Being clear from the outset with pupils and parents that my relationship with them will be confined to the research.
- Allocating the pastoral and academic oversight of these pupils to other members of staff in senior roles.
- Ensuring that the information about this arrangement is clearly visible to staff using the *quicknote* function on the school's database.
- Designing activities for focus groups that are enjoyable and engaging for pupils.
- Using training and expertise in child welfare and safeguarding to pick up on any signs of discomfort.
- Using the school's protocols for safeguarding and referring concerns to the designated safeguarding lead immediately.
- Ensuring pupils are clear that they can tell me if they do not wish to continue participation by using e mail and that they do not have to give a reason. Reminding them of that at the start, mid-point and end of each of the two academic years in the study.

- Encouraging pupils to ask questions about the research process and answering them as fully as possible.
- Designing activities that form a natural part of the school experience for pupils, parents and staff in order to minimise disruption, e.g. speaking to them at academic review time.
- Designating colleagues on the leadership team to whom teaching staff can go if they have any concerns about my conduct of the research.
- Being open and encouraging to staff questions about the research.
- Being clear with pupils, parents and staff about the contribution the research will make to education.
- Explaining the aims and methodology of the study to the leadership team and the governing body of the school.
- Anonymising all participants in the thesis and other publications.
- Obtaining full consents from all participants using approved information and consent documents.

I included several of these ethical practices in the information sheet and consent forms given to participants and their parents. Following is a copy of the pupil version.

September 2015

Pupil information and consent form

Do Mindsets Matter?

What is the study about and why am I doing it?

I am interested in finding out how learners think about intelligence and whether that affects their learning experiences. Does your thinking about intelligence change across the curriculum? Where do these ideas come from? What connects the way you view intelligence and your progress at school? What can we discover together that will help schools to help other pupils in future?

What will the research involve?

I aim to follow a group of 12 pupils during years 9 -11, starting in the spring term of year 9, using group interviews with you and your friends as well as individual interviews to find out from you how you think about intelligence and about learning and what you feel about your relationships with others in school. I will also record academic reviews with you and your parents. I will make use of the information we have in school that tells us how you're making progress too.

With your permission the interviews will be audio-recorded. I will change your name and the names of other pupils and teachers to protect the identities of all those involved in the study.

What will the research be used for?

I hope to learn more about the connection between our view of intelligence and our learning experiences so that I can help teachers, pupils, and parents to have positive experiences of teaching and learning in school in the future and so that more young people can become successful lifelong learners.

Do I have to take part?

Not at all. Anyone who takes part will be a volunteer and you can change your mind at any stage of the project without giving a reason.

If you would like to know more about the project and ask any questions then please don't hesitate to get in touch with me.

Safety and well being

Your well-being in this project – and in school at all times_ - is very important. If you or another young person becomes upset, a teacher you can talk to will be told and support will be put in place. Also, anything you say that suggests that another young person might be at risk of harm will be referred to an appropriate adult.

Your consent
- I have read and understand the information above.
- I have had the opportunity to ask questions about my participation in this project.
- I know that the project will help the researcher to learn more about the relationship between ideas about intelligence and experiences of learning at school.
- I know what the research is about and how I can be involved.
- I am happy to have what I say audio-recorded.

- I understand that my name and the names of the other pupils and my teachers will be changed.
- If the researcher becomes aware of any information that suggests I may be at risk, the school's safeguarding procedures will be followed, and the appropriate support will be put in place.
- I know that I can decide not to continue with the project at any time without giving a reason.

3.3.3 Reflexivity in practice

As the study progressed, I needed to keep returning to the implications of being a head teacher-researcher in my own school and practise the ethic mindfulness and reflexivity advocated above. I kept a research diary in v after every set of interviews and, after each stage of the transcribing and analysing, I made observational notes about the differential in the relationship that existed between me and the participants and their parents.

The focus group activities had helped to reset the participants' relationship with me so that they were able to see me as a researcher, but more than this they could see themselves as holders of important information, the sharing of which would contribute to understanding and help others. They were very happy to tell me that things were less than perfect in school, explaining the need for a consistent behaviour policy followed by all their teachers for example. They were comfortable with letting me know what was not working in the school I was responsible for and I was comfortable with this information, finding it helpful rather than a criticism. This was important: if I were researching in my own school, I needed to be open to criticism of it, and to learning about the things that needed my attention. In fact, I realised that the information these children were sharing about my school was invaluable. I

was open with the participants about this and they appreciated a school leader taking them seriously and being open to this feedback.

The children were aware of power differentials between me and their teachers, interestingly, and without prompting anonymised all their comments about teachers during the discussions we had, deliberately generalising their contributions. This carried through into the Curriculum interviews where there were only one or two references to teachers by name. I left blanks for these names when transcribing the interviews and reassured participants that I would do that.

There were occasional ethically important moments during the study when my researcher role had the potential to cross over into my leadership role, particularly my responsibility for pastoral care and safeguarding. One of the participants had become anxious about her learning prior to the study and was receiving counselling in school for anxiety. Her data indicated that her mindset could well be a contributing factor in that anxiety along with an unconscious pressure within the family to work hard and achieve. I deliberated about the ethics of sharing this information with the pastoral colleague working with her and would have done that had I felt that the information I was holding would reduce the risk to her wellbeing. The pastoral colleague had, however, come to a similar conclusion through her skilful work with the participant and there was no need to share confidences, although I did keep a close eye on the pastoral support to make sure the interventions were appropriate for her. When another participant became distressed in her academic review, I did what I would always do in those circumstances and stopped addressing the issue that had led to tears, in this case her effort

grades. That would need to be picked up another time and in a different way. At that point she and her parents needed support. When I examined the recording and the later transcripts I asked myself if my role as a researcher or my role as a headteacher had added extra pressure to a pupil who was disappointed with her grades. I realised that it was probably my role as a headteacher that increased the pressure that day, although the parents stated that this emotional response was something they were used to seeing and were keen to work with me to find solutions for their daughter. Although I decided to use the above participants in the final set of case studies because they both offered important particularities and were both well supported by their parents, I decided not to use another participant as the focus for a case study because his life had taken a very dramatic and distressing turn and I felt that continuing the study with him and his family would be far too intrusive.

The most important learning about being a headteacher-researcher, however, was that it was not possible to separate out the school leadership role from the researcher role. It would have made little sense to present two different personas to the participants, going in and out of researcher role when I needed to interview them or conduct their academic reviews. The children needed me to be consistently open with them and interested in what they had to say whether I was gathering data for the study or whether I was interacting with them outside the interviews. They also needed to know that that was how I would be with their peers. They had told me in the focus group that teachers who changed their demeanour and were unpredictable worried them. They wanted their headteacher – and as they had told me, all their teachers - to be

genuinely interested in them, to want to know them as individuals, to encourage them, support them, care about them, and help them.

They wanted to know that I meant it when I said I wanted to make things better in school with their help and they needed to see that in action. During the three years of the study, these children took part in a consultation about a new Behaviour for Learning policy and their views were powerful in shaping our response. Several of them took part in some work on what was going wrong for them in science lessons in year 10 and saw their views shared with school governors who monitored the resulting action plan on their behalf. They let me know they did not like some elements of their new uniform, so I supported them to redesign it with help from the suppliers. The experience of researching like this in my own school developed my own leadership in ways I had not expected when I started the study. It helped me to develop research-inspired tools to examine problems and find solutions and it gave me a much deeper understanding of the lived experience of the children and families in the community I served. I am still using that understanding as the focus for my school improvement work.

3.4 Shaping the study.

3.4.1 Deciding on the data

Having decided on an ethnography-influenced study designed around a set of nested longitudinal case studies bounded by year group and school, I needed to ensure that the data I collected would support the investigation into the research questions I was developing. I tabulated the early elements of my research questions against available school data to determine what was

available, how it would help me to address one or more of the questions and what was missing (see Table 3.3). There was helpful data readily available to me in school already: the participants' Cognitive Abilities Test scores (CATs) gave an indication of their baseline ability in nationally standardised tests on transition to secondary school; their school progress data gave an indication of effort and attainment at several stages during the study; school and Department for Education predicted and target grades were updated twice during the participants' Key Stage 4 years and eventually actual GCSE attainment was available. There were also two sets of teacher comments on their progress during each academic year.

What do I need to know?	What data have I got already?	What does it tell me?	What are the gaps?	How can I fill them?
Is it helpful to think of Growth Mindset in relation to activities other than problem-solving activities? IS Growth Mindset binary? Or do teenagers hold different Mindsets for different	PASS data over 2 years (7 & 8)	Pupils' overall attitudes to self, school and teachers	Detail about different types of learning/experience	I need to work with the pupils to elicit Mindsets for each type of activity.
	Academic review document	Pupils' own perceived strengths and weaknesses in subject terms	Specific information about activity types: the information is organised by subject rather than by activity	I need to analyse the subjects' activity demands and then zone them (e.g. problem-solving, literacy development, making,
	Progress data (effort grades, end of year attainment,	Pupils' effort and attainment in all subjects		

What do I need to know?	What data have I got already?	What does it tell me?	What are the gaps?	How can I fill them?
aspects of their school experience?	examination results)			moving, creating, remembering etc.)
	Teachers' comments	Teachers' views of pupils' attitudes to study, comments on attainment and effort and advice about future study		
To what extent is literacy development contingent on having a positive Growth Mindset?	KS2, CAT scores, reading and spelling scores and English assessments	Pupils' literacy levels on entry and progress in literacy development	Pupils' Mindsets around literacy	Discuss specifically with pupils – interview
	Reading conversations held with librarians Reading logs	Pupils' attitudes to reading Suggestions made to develop reading habits and abilities A record of what pupils are actually reading	Any similar information about writing	Discuss writing specifically with pupils – interview (ask pupils to bring a piece of writing they liked doing and a piece they found difficult to do and discuss)

What do I need to know?	What data have I got already?	What does it tell me?	What are the gaps?	How can I fill them?
Do relationships with teachers influence Mindsets?	PASS data	Attitudes to teacher generally	Nothing subject specific	Link into questionnaire about Mindsets – think of good questions Use as a starting point for discussion in interviews
	Academic review notes	Some information about individual pupil-teacher dynamics connected to academic self-concept ….	…. but patchy and incidental in current interview data	Link into questionnaire about Mindsets – think of good questions Use as a starting point for discussion in interviews
Is it helpful to think of Growth Mindset for pupils with SEN?	Pupil data as above + Student Support Plans	SSPs describe learning needs and suggest strategies to support	There is currently no data available about mind sets	Look at this as part of the interviewing process
Is it helpful to think of Mindsets for pupils with	Full pastoral records	All issues and interventions known to/	Only incidental data are	Look at this as part of the

What do I need to know?	What data have I got already?	What does it tell me?	What are the gaps?	How can I fill them?
emotional/ complex difficulties?		undertaken by/with school	available about mindsets	interviewing process
Is mindset the link between disadvantage and low attainment?	All above data + Pupil Premium interview notes and tutorial outcomes		Only incidental data are available about mindsets	Look at this as part of the interviewing process
How does school as a social construct affect mind-set?	PASS data	Shows how pupils feel about self, school, and teachers	Does not explore the complexity of managing learning in a social setting	Needs to be explored in the interviewing process
How does gender affect mind-set?	All data can be categorised by gender of participants	All above information can be categorised by gender	It does not explore the issue of gender in relation to mindset at all.	Needs to be explored in the interviewing process

Table 3.3 Initial research questions set against available data

A simple three item questionnaire designed by Dweck (Dweck, 1999) revealed the participants' Mindset score and this was easy to add to the information I was collating. This self-form is suitable for use with children aged 10 years or older. There are six questions available but three can be used alone according to Dweck. I used the three-question version as I needed my

participants to complete a second questionnaire about their curriculum. An

average is taken: below 3.33 indicates fixed-entity thinking, 3.33 to 3.66

suggests that the participant is borderline and above 3.66 indicates a growth

mindset or incremental theory. Dweck's simple Intelligence Theory

questionnaire is reproduced as follows.

Intelligence Theory Questionnaire
Read each sentence below and then circle ONE number that shows how much you
agree with it. There are no right or wrong answers.

1. You have a certain amount of intelligence, and you can't really do much to
   change it.

1	2	3	4	5	6
Strongly agree	agree	Mostly agree	Mostly disagree	disagree	Strongly disagree

2. Your intelligence is something about you that you can't change very much.

1	2	3	4	5	6
Strongly agree	agree	Mostly agree	Mostly disagree	disagree	Strongly disagree

3. You can learn new things, but you can't really change your basic intelligence.

1	2	3	4	5	6
Strongly agree	agree	Mostly agree	Mostly disagree	disagree	Strongly disagree

(Dweck, 1999, p.177)

this early survey of available data that I would need to interview participants in

order to explore most of these issues.

3.4.2 Case study participants Having made the decision to bound my participants by school - they would all be in the school where I was a senior leader - I also decided to choose all the participants from a single year group: year 9. Thus, my participants would experience the various school-based "rites of passage" simultaneously. They would all receive reports at the same time, all choose their GCSE options, progress to Key Stage 4, sit examinations and leave compulsory education together. I should be able to track changes at these key times. These participants had had two years in Key Stage 3 and would be able to look back and tell their stories about transition and Key Stage 3. These children would also leave compulsory education within the time boundaries of the study (3 years) enabling me to have access to outcomes data including examination results and destinations. I would be able to see them choose their options subjects, embark on these options, prepare for public examinations, decide on their post-16 destinations and start on their chosen pathways. This would mean that the study would encompass the whole of their secondary schooling from transition from primary school to leaving secondary school, even though the earliest years of their secondary school experience would be a retrospective told through their own memories.

I set out to find six very different children whose learning journeys I would follow closely and about whom I would write detailed case studies. This number would enable me to achieve a balance between breadth and depth, allowing me to include a range of different learners in terms of gender, socio-economic background, prior attainment, primary school experience and special educational needs whilst investigating their learning experiences in

detail. I sat down with the school's pastoral lead for year 9 and together we worked through the 232 pupils in the school's year 9 group, dividing them first by gender, then by prior attainment based on CAT scores. We highlighted pupils with Special Educational Needs (SEND) and then selected a long list of pupils from the different categories. The pastoral head eliminated pupils who were subject to Child Protection or Child in Need plans as we felt that the study would be too intrusive and disruptive for children who were already working with other agencies. We grouped the remaining children into gender, prior attainment score bands, primary feeder schools, SEND profiles and CAT scores. The original 12 children I decided to approach were selected from across these groups so that they included pupils who represented the different groupings in the categorisation process. There were 6 boys and 6 girls who between then represented all 3 prior attainment bands (low, medium and high) and who were from different feeder primary schools. Twenty-five per cent (3 pupils) were on the SEND register in school but these pupils had a range of CAT scores from below average to significantly above average. They also represented a range of family backgrounds and socio-economic profiles, including disadvantaged pupils.

I outlined the study to the nominated pupils all together and then wrote to their parents using participant information and consent forms and asked them if they would be willing to take part. I was hoping to have between 8 and 10 children take part in the study to allow for any attrition over time, for example, through pupils moving schools or deciding not to continue as participants. I was willing to return to the longer lists of children should those I had invited not want to be involved. However, all 6 boys and 5 of the girls agreed along

with their parents that they would participate. The 6th girl was adamant that she did not want to be part of the study, although her parents thought it would be a good idea, having discussed the study at length with me. As the other 11 participants expressed high levels of interest in taking part, I decided to involve them all, using all their data to conduct a thematic analysis before focussing in on 6 of the participants to develop full case studies. There was something to be gained for all these students in being able to talk in depth and detail about their experiences of learning and it was something they wanted to do. I did manage to collect a considerable amount of data because of these numbers.

The larger data base I amassed due to starting with 11 participants allowed for a broader base from which to draw out the key themes during the early stages of analysis and meant that I could choose to focus on the final 6 participants who would be the subjects of detailed case studies based on their exemplification of the key themes. I chose children whose experiences countered Mindset Theory: Beth with her fixed entity thinking but who did achieve academic growth, Ellie with her high growth mindset score and her very disappointing decline. I chose SEND pupils with low prior attainment whose stories were very different in terms of motivation and achievement: Alex who more or less gave up at school and Lennie who was focussed on his ambitions. Finally, I chose an able boy and girl who had borderline growth mindsets and very different journeys: Oscar who struggled with self-regulation and Vicky whose self-regulation skills saw her achieve academic growth successfully.

Table 3.4 gives some basic information about the participants. The

participants who eventually became the subject of case studies are marked *.

Their Mindset score was taken from the Dweck Intelligence Theory

questionnaire and represents the average score over 3 questions.

Participant	Gender	Average Cat score	Mindset Score	SEND?	Parental involvement in study
Beth *	Female	105	3		Mother
Ellie *	Female	103	4		Mother and father
Andy	Male	102	3.66		Mother
Alex*	Male	92	3.33	SpLD	Mother
Oscar *	Male	127	3.66		Mother and father
Lennie *	Male	89	2.33	SpLD	None
Kai	Male	113	2.33	ADHD	Mother
Mary	Female	118	4.33		Mother
Keith	Male	118	5		Mother and father
Vicky *	Female	110	3.66		Mother
Oona	Female	112	2.66		Mother

Table 3.4 The original 11 participants

3.5 Data collection

Table 3.5 gives an overview of the data collected about each participant and

shows the timing and phase of each key data point.

Key dates	Phases	Data item collected	Description
December 2016	Preparatory	CAT scores	Cognitive Ability test scores. Test taken on entry to

Key dates	Phases	Data item collected	Description
			secondary school (September 2014) Nationally standardised tests to establish range of abilities. Average score=100
December 2016		Effort grades Year 9	Teacher grades (1-5) to indicate level of effort according to internal definitions used by school. 5 is high. Reports state that pupils who make the most progress academically have an average effort grade (EG) of 3.82 or higher.
December 2016		Student Support Plans (for SEND students)	Plan generated by the Learning Support Department describing the nature of a pupil's learning difficulty, outlining the support they are given in school and suggesting helpful teaching strategies

Key dates	Phases		Data item collected	Description
January 2017			Focus groups recorded and transcribed	Participants divided into 2 groups and asked to discuss questions about learning and to describe their ideal teacher
January 2017			Growth Mindset Questionnaire	Implicit Theory questionnaire, taken from Dweck (Dweck, 1999)
January 2017			Mindsets across the curriculum questionnaire	Participants asked to match each subject on their timetable, along with cross curricular learning themes to one of 6 statements. To be used as a starting point for semi-structured interview.
February 2017	phase	Initial analysis and theoretical modelling	Semi-structured interview based on mindsets and the curriculum (45-60 minutes)	One-to-one interview recorded and transcribed.
February 2017			Pupil progress tracker year 9	Report for parents with effort grade and progress data RAG rated according to whether the pupil is on track

Key dates	Phases	Data item collected	Description
			to achieve their end of year predicted grades, together with teacher comments outlining what is going well and ways to improve
March 2017		Academic reviews year 9 - recorded and transcribed (30 minutes)	Tripartite meetings with reviewer, parent/s and pupil to discuss progress, learning targets and option choices. Pupils prepare for the review by reviewing their own progress beforehand and reviewers follow a suggested outline for the review.
October 2017	Refocussing phase	Effort grades - year 10	
December 2017		Pupil progress tracker - year 10	Report comprising effort grades, teacher predicted and target grades for GCSE and DfE median and upper quartile grades derived from 3-year transition matrices based on national data.

Key dates	Phases	Data item collected	Description
March 2018		Pupil progress tracker with internal examination results and effort grades	Teacher marked, internally set "mock" examinations – results reported to parents on tracker
April 2018		Academic review – year 10. Recorded and transcribed – 30 minutes	Tripartite meetings with reviewer, parent/s and pupil to discuss progress, learning targets and revision. Pupils prepare for the review by reviewing their own progress beforehand and reviewers follow a suggested outline for the review.
October & December 2018		Effort grades	
March 2019		Pupil progress tracker with internal examination results, effort grades to date and update teacher predicted and target grades.	"Mock examination" results and teacher predicted, and target grades inform internal sixth form interviews and are asked for by other post-16 providers as part of references.

Key dates	Phases	Data item collected	Description
August 2019		GCSE results	Public examination results of level 2 courses published
October 2019		Destinations data collected	INSPIRA collate current data on the whereabouts of learners in this cohort: sixth form/ college/ workplace with training

Table 3.5 Key data points

Having identified my participants and collated their CAT scores, average effort grade for year 9 to date and any information about their Special Educational Needs (SEND) where it was relevant, I designed the early part of the study.

I met with the group in January 2017 in a conference room and asked them to complete the Intelligence Theory Questionnaire and to complete a simple questionnaire whereby they rated each aspect of their curriculum against a set of six statements:

1. I can't do this, so I give up easily.
2. I find this hard and I try very hard to improve but I don't seem to get very far.
3. I find this difficult, but I know I can improve it if I work at it
4. I'm good at this and don't really have to work at it to do well.
5. I'm good at this and know that when I work really hard at it I'll get even better.

6. I can do this if I get on with my teacher.

The curriculum questionnaire listed all the subjects on their timetable and also cross-curricular aspects of learning, for example literacy, revising for examinations, problem solving and creativity.

While we were still together, I split the participants into two discussion groups and asked them to discuss what makes a good teacher and to give some advice to someone who was just starting out as a teacher. I was hoping to achieve two objectives in this initial activity: the first was for them to see me as a researcher genuinely interested in what they had to say even if it was something negative about school, and the second was to hear them talk in an uninhibited way about learning to help me to gauge how possible it was going to be to get them to talk about their learning in interview situations.

The conference room was intended to be a space that treated them as valued participants whose voices were important. It removed us from the classroom, where the teacher-pupil power relationship is so understood, to a professional space where they had shared status and where they stood up and "taught" me at various points in our session. The participants started by writing their thoughts on post-it notes then grouping them on a wall chart and talking about them without me being anywhere near them. I then asked them to talk me through the ideas on the post-its. I asked the first group to give a new teacher advice at this point in order to elicit the things that teachers did to help them to learn, and they were able to do that straight away. I asked the second group to think of their favourite teacher and what they liked about their teaching. Again, there were ready answers.

Even at this early stage there were common themes that most participants agreed on - they all wanted to be known by their teacher, for example - whilst there were individual responses: Andy wanted to be left alone by relaxed teachers; Keith preferred teachers who were good at controlling the class and Lennie wanted to be given responsibility. I was confident after this activity that they would have no qualms about talking freely and openly and that they were able to engage in ready conversation about their learning experiences. (See Appendix 1: Transcript of group session 1.)

The next stage was a semi-structured interview with each student participant, based on their Growth Mindsets Across the Curriculum questionnaire. These interviews had a simple format and took place in January – February 2017. They started with my asking each participant whether they thought intelligence was something they were born with or whether they thought that they could grow their intelligence with effort. I then moved on to their curriculum questionnaire responses, starting with all the aspects of the curriculum they had matched with statement 1, through to 6 in that order, asking them to explain why they had matched that experience to that statement. The statements came from the original research questions where I was asking whether children had different implicit theories about different aspects of their curriculum, beyond problem solving, particularly literacy development. I was also interested in the significance of relationships with teachers, having spoken to so many children who said they could not learn because they did not get on with their teachers. Each interview followed roughly this pattern and the probe questions were a useful preparation for me

as I prepared to respond to what the children said and to tease out their thoughts and meanings. See the schedule following.

98
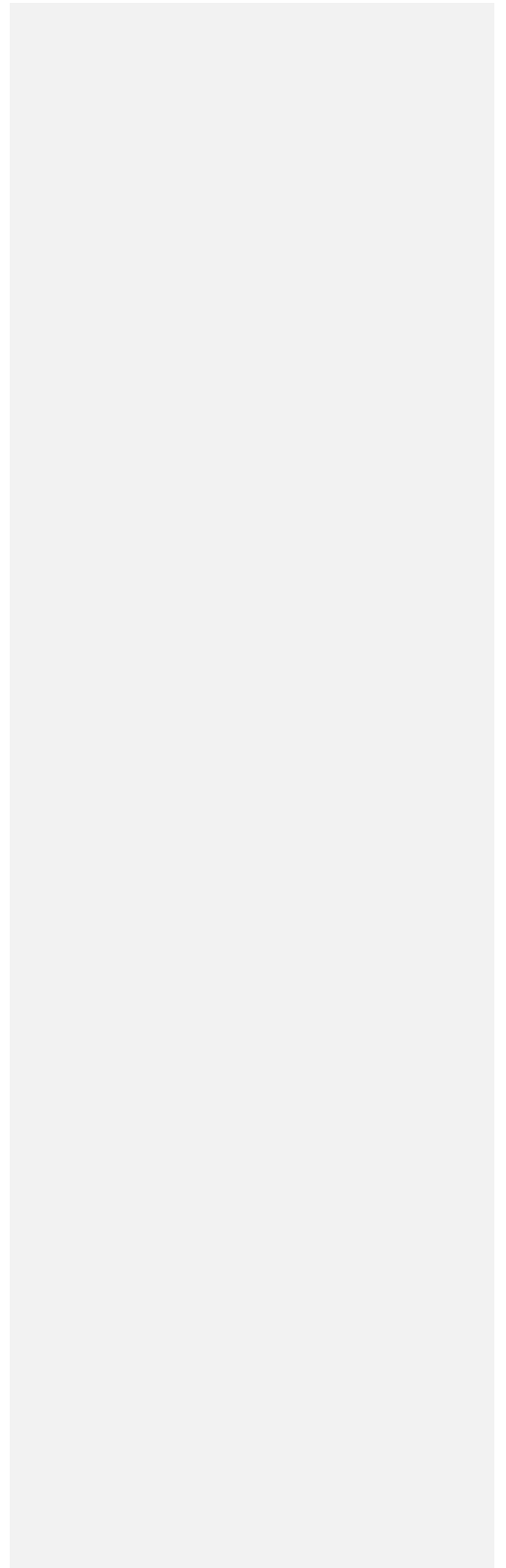
Mindset and curriculum interview

1. **Do you think you are born with a certain intelligence which doesn't change, or do you think that intelligence is something you can grow with effort?**

Probe – can you think of times when you have been aware of growing your intelligence? What did you do? What do you think intelligence is? Who would you say is intelligent? Why?

2. **Tell me about the subjects you have rated 1: I can't do this, so I give up easily. Why have you said this about these subjects?**

Probe – have you always felt like this? Tell me what it is like in the lessons for you? Why do you think you can't do this subject?

3. **Tell me about the subjects you have rated 2: I find this very hard and I try to improve but I don't seem to get very far.**

Probe- why is this subject hard? What have you tried to do to improve? What happened? What makes you think you are not making progress?

4. **Tell me about the subjects you have rated 3: I find this difficult, but I know I can improve it if I work at it.**

Probe- what do you find difficult? Can you say what you can do to improve at this subject? Why don't you do that?

5. **Tell me about the subjects you have rated 4: I'm good at this and don't really have to work at it to do well.**

Probe- What makes you say you are good at this subject? Why do you think you are good at this subject? Do you make any effort in this subject?

6. **Tell me about the subjects you have rated 5: I'm good at this and know that when I work really hard at it I'll get even better**.

Probe- What makes you say you are good at this subject? Why do you think that? What do you do to work hard in this subject? How do you improve when you do?

7. **Tell me about the subjects you have rated 6: I can do this if I get on with my teacher.**

Probe- Why is it important in this subject to get on with your teacher? What do you mean by getting on with your teacher? What helps you to feel like this? What doesn't help?

The participants were all able to articulate the reasons for their responses and gave additional details about their experiences in each subject area. Occasionally, I needed to use follow up questions to clarify or reframe an issue and often dialogue developed around issues as we explored them together.

I transcribed each semi-structured curriculum interview, reading them through and listening to the recording several times over in order to start assigning very initial codes to the transcriptions. I also recorded my reflections on these interviews in a research diary. There were some key themes emerging and recorded in the diary: the use of colloquial language to describe learning; the "newness" for the participants of a conversation about intelligence; the calibration of understanding about ability based on setting and comparisons with others; the desire to be treated holistically by adults in school.

In February – March 2017 the participants received their Pupil Progress Trackers and were invited to attend an Academic Review to discuss their progress, analyse their learning through a set of pre-designed prompt questions and talk about their option choices for GCSE. These pupils had the added choice available to them of enrolling in the new Studio School about to open in September 2017, offering specialist technical pathways as well as GCSEs and creating a Multi Academy Trust (MAT) on a shared site with their original high school who was the sponsor academy for the new Studio school.

The decision to use these naturally occurring tripartite discussions about learning as opportunities to collect qualitative data rather than schedule in additional interviews with students and parents was partly expedient. There

was a reluctance to take pupils out of lessons or encroach on their social time at lunch time or after school, whilst the school was already asking parents into school twice during the year to attend an academic review and a subject review evening. The academic reviews were an accepted part of the school year, with parents willing to attend them. Their structured focus on a discussion about learning and about support for learning in the home meant that they would be ideal opportunities to record further discussion about learning and to include parents in those discussions.

All participants and their parents were asked if they would be happy to continue to be part of the study and to have their academic review recorded as part of the data collection. All gave their consent at the start of the review and were interested to hear about some of the preliminary findings and wanted to find out whether by taking part they were perhaps making a useful contribution to the development of greater understanding about how schools can help children to learn.

The academic reviews followed a clear structure set out by the school to discuss results of recent assessments, introduce some dialogue initiated through prompt questions around what was going well, and agree a set of learning targets to support future progress before going on to talk about intended option and school choices. Each reviewer is given a pro forma with a suggested outline of discussion:

Academic Review Pro Forma

Suggested outline of discussion.
Talk about their assessment results and progress.
Use evidence to support their views (refer to tracker effort grades, predicted levels / grades and current progress)

Talk about what they are good at and what they would like to improve.

Link to what would be needed at KS4/5.

Discuss/ amend their targets. Check they are suitable and realistic.

Explain their
- Intended option choices.
- Future career plans if known

Discuss how realistic their choices are.

Any help/ intervention needed? (options/ careers guidance? Monitoring report? Pastoral support?)

Any other items discussed? Parent views and questions?

What's going well?

Even better if?

Option choices:
1
2
3
4
5
(for KS4 – e bacc subject score)

I transcribed the recordings from these academic reviews and was thus able to add parental voices to the data I was collecting. Again, I reread these transcriptions and listened to the recordings several times, eventually adding some early coding to these transcripts. I could now start to tabulate the interview data, first listing and grouping together the initially coded data items under category headings before suggesting thematic codes. (See Appendix 2: Alex's data table as an example.)

I continued to observe the participants in school, helping to finalise their school and option choices, support their transition to KS4 in both schools, supervise any pastoral interventions or additional support and generally monitor their progress and their behaviour in school in my capacity as a senior school leader. Mindful of the ethical practice guidelines I had set myself, I ensured that colleagues from the pastoral team dealt with issues beyond research questions about learning. Six of the cohort had opted to move to the newly opened Studio School and joined at the start of their year 10 in September 2017 (Alex, Lennie, Kai, Keith, Andy and Oona). Whilst my day-to-day work with the pupils did not form part of the data collection it was important for me to recognise that I was being afforded additional insights into these learners' contexts which were helpful to me when interpreting their interview data.

The schools followed identical calendars due to their co-location and sharing of staff and structures. They both published year 10 Pupil Progress Trackers in December 2017, showing effort grades as well as school and DfE predicted and target grades for their level 2 qualifications. In the following spring term, the participants sat internal examinations. Their results were added to their

trackers and the year 10 academic review season got under way. The participants and any attending parents were asked if they were still willing to participate in the study and agreed to be recorded. They were all pleased to get an update on the study and for it to continue.

I transcribed the academic reviews, which followed the same format of a discussion of the progress and effort data with a discussion about what was going well and which areas for development to express as learning targets. Having read and listened to them repeatedly, I coded the transcripts and added the data for each participant to their data coding table thus enabling the identification of provisional code and categories to support the analysis. The collection of school data continued, including further data drops indicating effort, predicted and target grades, mock examination results and eventually actual GCSE results and destinations data.

I collated the data for each participant separately: each anonymised participant had their own folder with their interview sound files, transcripts and school generated data. These were password protected behind the school's firewall and available only to me. All data held by school on behalf of its staff and students are protected by GDPR regulations and staff in school follow strict protocols around the protection of data privacy. The schools have a Data Protection Officer who oversees data security and to whom any breaches would need to be reported.

3.6 Analysis

Figure 3.1 shows the different phases of the analysis with each colour-coded phase broken down into its component steps. In this section I explain each stage of the analysis in detail in the order presented in this figure.

Mid blue: preparatory phase
Light blue: Initial analysis and conceptual modelling phase
Dark blue: refocussing phase

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┌─────────────────────┐      ┌─────────────────────┐      ┌─────────────────────┐
│                     │      │                     │      │  focus groups and   │
│ conceptual framework│ ───▶ │  research questions │ ───▶ │   questionnaires    │
│                     │      │                     │      │                     │
└─────────────────────┘      └─────────────────────┘      └─────────────────────┘

┌─────────────────────┐      ┌─────────────────────┐      ┌─────────────────────┐
│                     │      │ year 9 academic     │      │ provisional codes   │
│ curriculum interviews│ ──▶ │ reviews             │ ───▶ │ and categories      │
│                     │      │ ( adds parent voice)│      │                     │
└─────────────────────┘      └─────────────────────┘      └─────────────────────┘

┌─────────────────────┐      ┌─────────────────────┐      ┌─────────────────────┐
│ development of early │      │                     │      │                     │
│ themes and experiment│ ──▶ │ refined research    │ ───▶ │ year 10 academic    │
│ with Learner Identity│      │ questions           │      │ reviews             │
│ Paradigm            │      │                     │      │                     │
└─────────────────────┘      └─────────────────────┘      └─────────────────────┘

┌─────────────────────┐      ┌─────────────────────┐
│                     │      │                     │
│ Refined categories  │ ───▶ │ six detailed case   │
│                     │      │ studies             │
└─────────────────────┘      └─────────────────────┘
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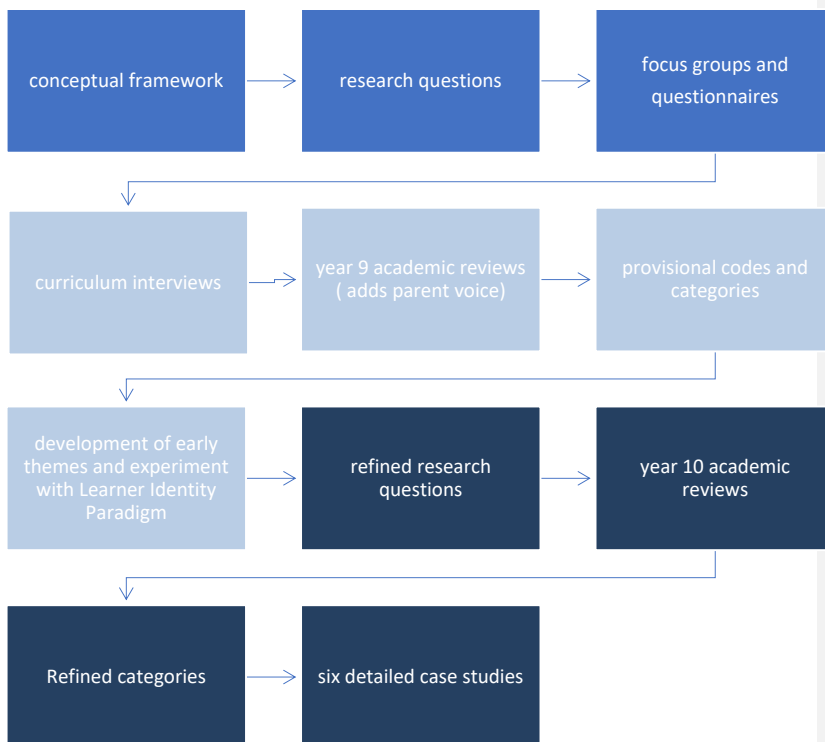
Fig. 3.1 Overview of stages in the analysis

3.6.1 Preparatory phase

3.6.1.1 Conceptual framework

Theories emanating from the field of cognitive psychology are currently being used in schools to promote successful learning outcomes. These theories focus on the learning process itself, making recommendations about types of feedback, models of progression, types of learning activity and styles of teaching. They acknowledge that children have different starting points in terms of age, ability or mind set but do not really consider that children have different starting points in terms of their social and emotional development or in terms of how they are coping with the social construct that is school. Theorists assume that a learning strategy will be effective for pupils, differentiating for ability, for example, Black and Wiliam (Wiliam, 1998) but not for the relational position of the individual child.

I based my early theorisation on observations from experience of working in schools, namely:

- Pupils often become increasingly disengaged and disaffected over time.

- Classrooms with older disaffected pupils in them are much more difficult to manage than younger groups.

- Early intervention to engage pupils and parents has reduced levels of disaffection and raised attainment.

- Bespoke curricula, playing to pupils' interests and sense of self have dramatically reduced disaffection and raised attainment.

- Skilled pastoral staff who are able to "see where pupils are coming from" and engage well with parents have had a significant impact on engagement and consequently classroom environment.

- Pupil Attitude to School and Self (PASS) survey results show that, whereas the school population is mostly very positive about school, learning and teachers, individual pupils feel very differently – they have a different "lens" through which they are approaching school and teachers and it is producing different responses in comparison with peers.

My early contention was that, when a child viewed the relationship between themselves and school positively, then they were more likely to access and engage with the cognitive processes that the learning interaction is intended to promote. Engaging with cognitive processes results in successful learning experiences that then increase the degree of positivity with which the child approaches future learning transactions: a virtuous circle or "harmonious cycle". The positive experience means that the child identifies more strongly with the values and norms of schooling and builds on their academic self-concept. They then positively affect the classroom environment.

 If, however, the child has a negative view of their relationship with school then the learning transaction runs the risk of failure of intent and rather than promote a cognitive process it triggers an emotional one that reinforces a negative view of self and school. The child does not engage with cognitive

processes, bypassing them in order to process the emotional and relational impact of negatively received learning transactions. This child is then at risk of failure and is more likely to receive negative feedback as a result which compounds the issue, and which can be very damaging: in other words, an "opposite cycle". There is a consequent opposite impact on the classroom environment. Each time a cycle is completed, whether it be harmonious or opposite, the child's sense of their relationship with the complex social structures within school deepens either positively or negatively and becomes part of the set of relational influences that have a bearing on the next learning interaction and the cycle starts again.

I focussed on Growth Mindsets as a theory that seemed to have the potential to "unlock" some of the mysteries around cycles of underachievement. I began by assuming that altering teachers' practice would allow pupils with fixed-entity mindsets to access malleability priming more successfully. I was theorising that Implicit Theories of Intelligence emanated from the relational aspects of a learner's experiences and suggesting that we needed to understand more about that in school to the point where we worked with the relational aspects of a learner's identity more deliberately.

I followed the studies inspired by Dweck's work in assuming that there could be pedagogical adaptation that would shift mindsets so that they were more incremental, but I hypothesised that sustained deliberate practice by teachers would be more likely than one shot interventions to make for long-lasting improvements in attitudes to learning. I had also observed that most children seemed to have a range of self-theories that varied across their broad

curriculum and was interested in whether that was in fact the case and whether that complexity and uniqueness had a bearing on their overall experiences in school. Figure 3.2 illustrates the early conceptual framework.
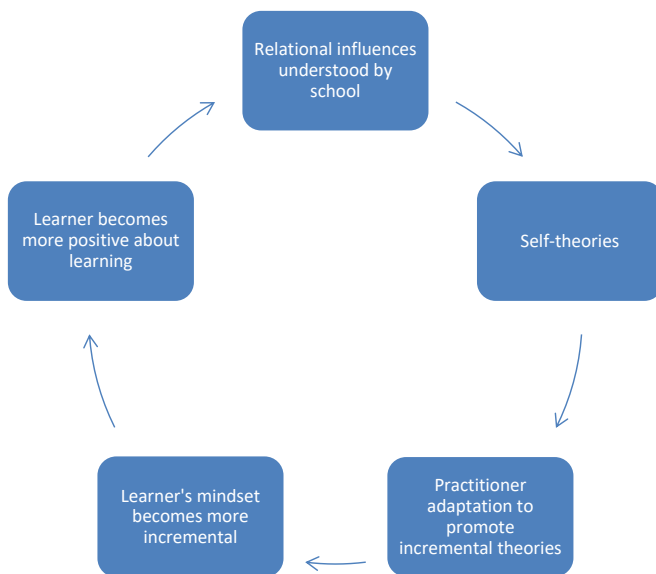
Fig. 3.2 Investigating the impact of teacher practice on fixed-entity theorists.

3.6.1.2 Focus groups and questionnaires helped to refine the conceptual framework and to shape the analysis

I had selected my cohort of year 9 pupils and set up a focus group session with them. The main aims of the focus group were to hear them talk together about what helps them to learn and what gets in the way, and about what makes a good teacher and a good lesson. I also wanted to use the focus group session as an opportunity to "reset" my relationship with the participants and for them to see me as a researcher to whom they could speak in

confidence, who was interested in what they had to say about their school experiences, and who would use what they told me to find a way to improve the learning experience for others.

I transcribed the recordings of the two focus group discussions and assigned a set of initial codes around the key issues discussed: what they liked or disliked about teachers and their lessons. This allowed for the development of some early categories relating to teachers and lessons. The issues raised by the participants were predictable, probably because these classroom experiences are so universally understood by anyone who has been taught. The data served to underscore the importance of the relational to children who respond well to being known and supported. I did ask, however, if these are such self-obvious truths about teaching, why were these participants reporting that not all their teachers lived by them? In the final analysis, the focus groups' most helpful contribution to the wider study was in its privileging of pupil voice and resetting their relationship with me as a researcher who cared about what they were telling me.

I was able to look at some of the individual participants' contributions to the focus groups when I was constructing the individual case studies and it was interesting to look back at their earliest contributions in the light of the more detailed understanding, I was gaining about their learning experiences. Table 3.5 sets out the initial coding arising from focus group discussions.

Initial categories	Positives	Negatives
Classroom practice	Walks around the class to help you	Just writes notes
	Explains clearly	Goes too quickly
	Understands when you don't get it	Shouts and says they expected you to get it
Classroom management	Fun but fair	They get angry
	Uses humour – sense of fun	
	Has rules	Different rules in different classrooms
Relational practice	Knows you	Has no interest in you
	Understands how to help you	Criticises you or the class
	Understands you have other subjects to learn	
	Encourages you	
	Approachable when you need help	
Homework expectations	Flexible – acknowledges life outside school	Inflexible and unreasonable

Table 3.5 Initial coding of focus group discussions: what makes a good teacher?

At the focus group session, I asked participants to complete the two questionnaires I had devised for them. The first, the Intelligence Theory Questionnaire is Carol Dweck's own simple test. Responses were graded 1-6 and averaged to create a Mindset score. Four and above indicates a Growth Mindset or Incremental Learner, 3 or less a Fixed Entity Learner. Scores

between 3.3 and 3.7 are classed as borderline. The scores are in the second column of Table 3.6. On one side of the Intelligence Theory score I have placed the pupil's CAT average (Cognitive Abilities Test). This baseline assessment of a pupil's ability is a helpful indicator for schools. One hundred is the national average and pupils with this should be able to achieve grade C (now grades 4/5) in a minimum of 5 subjects at GCSE including English and mathematics. On the other side I have placed the pupil's year 9 average effort grade. This school-based assessment of effort is well supported by several years' data and is a reliable indicator of attainment. Pupils who consistently have scores of 3.82 or above are on target to achieve at the Upper Quartile (i.e. in the top 25% of pupils nationally who share their starting point based on KS2 data). The next 6 sets of columns contain tallies of the number of ticks given by each pupil for each response on their curriculum survey. These are presented as a raw score and a percentage. The column numbers refer to the statements below.

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1. I can't do this, so I give up easily.

2. I find this hard and I try very hard to improve but I don't seem to get very far.

3. I find this difficult, but I know I can improve it if I work at it.
4. I'm good at this and don't really have to work at it to do well.
5. I'm good at this and know that when I work really hard at it I'll get even better.
6. I can do this if I get on with my teacher.

Pupil	CAT Ave	ITol	Mind Set	EG	1	%	2	%	3	%	4	%	5	%	6	%
Beth	105	3	Fixed	4.21	0	0	2	8	13	52	2	8	8	32	0	0
Ellie	103	4	GM	4.12	0	0	3	12	8	32	4	16	10	40	0	0
Andy	102	3.66	Border	3.62	0	0	1	4	7	28	1	4	13	52	2	8
Alex	92	3.33	Fixed	3.57	1	4	2	8	4	16	3	12	12	48	3	12
Oscar	127	3.66	Border	3.88	0	0	1	4	2	8	10	40	10	40	2	8
Lennie	89	2.33	Fixed	3.5	1	4	3	12	6	24	7	28	7	28	0	0
Kai	113	2.33	Fixed	3.06	5	20	1	4	4	16	7	28	6	24	2	8
Mary	118	4.33	GM	4.18	0	0	2	8	13	52	1	4	8	32	0	0
Keith	118	5	GM	3.99	0	0	1	4	11	44	0	0	12	48	1	4
Vicky	110	3.66	Border	4.09	0	0	5	20	9	26	5	20	6	24	0	0
Oona	112	2.66	Fixed	3.68	1	4	5	20	10	40	6	24	3	12	0	0

Table 3.6 Mindset scores and mindsets across the curriculum

Three pupils were securely in the Growth Mindset category, Keith, Mary, and Ellie. Five pupils were Fixed Entity learners: Beth, Alex, Lennie, Kai, and Oona. The cohort was very small but there was an even split in terms of gender for both categories. The remaining three pupils - Andy, Oscar, and Vicky - were borderline. Both pupils with below average CAT scores had fixed entity mindset scores, as did all three pupils with SEN. It was good to see that the cohort of 11 pupils had an even distribution of mindset scores with children in all 3 categories. That would allow me to look across the cases to see if I could detect different responses to learning experiences over time from participants with different mindset scores. This early survey was also helpful in that it suggested that different children had different "mindset profiles", in other words they responded differently to mindset questions about different aspects of the curriculum.

Only Kai reported an awareness of significant helplessness responses in the face of difficulty. He felt this was true of 5 different aspects of the curriculum. That stood out as the other children reported minimal helplessness responses. There were slightly more responses indicating a sense of frustration when participants made effortful responses to setback (response 2) and much higher responses indicating an awareness that effort would help to overcome difficulty (response 3). Oscar stood out with 10 response 4s – feeling so good at something he did not have to make much effort, whilst the highest scores for most participants were in response 5, where they felt they were good at something but knew that hard work would make them even better at it. I was surprised that, after everything the participants had said in the focus groups about what made a good teacher that only 4 of them had significant scores in response 6 and felt that their ability to learn in a subject was dependent on their relationship with their teacher.

As I reached the end of the preparatory phase and looked at the early sets of data afforded by the focus groups and the questionnaires, I was already starting to refine my approach and to think carefully about what I needed to elicit from interviews with the participants and an opportunity to discuss their learning with them and their parents at their subsequent academic review. I wanted to delve deeper into what these children thought about intelligence, what made them resilient, what constituted difficulty and setback, why they felt they were good at certain subjects and why so few of them felt that their relationship with a teacher mattered when it came to learning. I was also interested in finding out more about the relationship between low cognitive

ability scores and fixed entity thinking as well as the relationship between having a recognised SEN and believing that intelligence was innate.

3.6.2 Initial analysis and theoretical modelling phase

 I used a form of coding and categorising to produce themes in line with the description by Braun and Clarke of thematic analysis (Braun, 2006, Braun & Clarke, 2019).

> Through its theoretical freedom, thematic analysis provides a flexible
> and useful research tool, which can potentially provide a rich and
> detailed, yet complex, account of data. (Braun, 2006)

Their paper offered a useful 15-point checklist of criteria for good thematic analysis which I used to apply a quality assurance process to the study (Braun, 2006, p.96). Whilst there are advantages to this approach, not least of which are flexibility, accessibility, and its ability to summarise a large body of data, there is a need to guard against "mere description". I needed to make sure that my analysis proved useful in providing insights useful to educators and policy makers. I made sure that I coded every data item first of all before grouping data items with the same codes together in a table for each participant. The participants' individual data tables developed over the eight school terms of the study, being added to each time a new transcript was coded. I checked the grouped codes against each other and back to the original data sets to ensure that the groups on the data table were thorough and comprehensive.

This groundwork on initial codes proved to be helpful as it meant that I could categorise the coded data items under more general headings (see Table 3.6). As with the initial coding phase, categorisation was also an iterative process of updating, renaming, linking, and incorporating. Some categories, like motivation for example, became two distinct categories: motivation / lack of motivation. The categories then served to underpin the major themes that were to inform the outcomes of the study: mindset complexity; learning mechanisms; learner literacy; family and community narratives; and identity.

I also had school assessment data to add to the qualitative data I was collecting and analysing. This information about prior attainment, learning difficulties, progress, effort and eventually outcomes could be set against the unfolding narratives around learning gleaned from the curriculum interview and two academic reviews in order to examine the relationship between what participants and their parents said about learning experiences and the discernible learning behaviours and outcomes recorded in school data. Once the thematic analysis was far enough advanced and the participants had completed their compulsory education it was possible to use a refined set of thematic headings to serve as clarified research questions to apply to a series of individual case studies.

3.6.2.1 Curriculum interviews

The semi-structured curriculum interviews yielded fascinating early data that not only helped me to start answering some of the original research questions but also led to new avenues of enquiry and emphasised the significance of issues I had assumed were peripheral or incidental. I started to build up detailed data tables for each individual in the study, grouping initial codes into categories before suggesting key themes emerging from these interviews (see Appendix 2: Alex's Data Coding Table for an example). Whilst the eleven participants' interviews were all very different, there were clear cross-case themes emerging from the analysis. I had anticipated coding for mindset with the associated theme of resilience as the interview questions were designed to elicit discussion of these issues, but in Table 3.6 I was able to add further themes that were clearly worth pursuing.

Thematic coding	Description
Mindset	Participants ranged from fixed entity to growth mindsets, explaining what they thought about intelligence as a concept
Resilience	Participants explained both the nature of setbacks and either effortful or helplessness responses to difficulty
Motivation	Related to resilience. Participants who reported a desire to make progress within a curriculum area were able to display resilient responses to difficulty, whilst those who

Thematic coding	Description
	were unmotivated for whatever reason were less likely to report resilience.
Metacognition	Strategies used by participants to overcome difficulties, work out what they needed to do next, find a way of learning that works for them.
Belonging	Participants reported belonging to family groups, communities, friendship groups, classes, school, workplaces and extra-curricular groups e.g. sports teams or drama groups
History	Participants talked about primary school, transition, and early secondary school experiences. They also related family narratives about their earlier life.
SEN	Participants with SEN - and others - talked about significant barriers to learning and the need for support

Table 3.6 Early thematic coding based on year 9 curriculum interviews.

3.6.2.2 Academic reviews and parent voices revealed an unexpected possible finding

I was able to use these thematic headings to develop the data table for each participant after the year 9 academic reviews. These reviews meant that I could add the parent perspective from the academic reviews to the data I was

amassing. The academic reviews were structured by pre-prepared prompt questions, common to all pupils in the year group, and invited contributions from parents about perceived problems, successes, and also study habits in the home. They therefore had limitations in that the reviews could be pressurised and stressful for parents, particularly as they were being conducted by a senior school leader, and they did not allow for detailed exploration of parents' views beyond the parameters of the review. They nevertheless afforded some helpful insights into parents' views of the learning experiences of their children. I added the parent data to the individual student's data table at this stage, but I did a separate analysis of this parent data following the year 10 academic reviews (see Appendix 3: Coding table - parental comments during academic reviews).

When I decided to use academic reviews as part of the data for this study, it was partly expedient as it was a routine event that parents, and students, expected to attend but it was also to provide an additional viewpoint that could help to triangulate some of the information the children were sharing about their learning. It could also give some additional substance to my understanding of the relational issues that were the starting point for the study.

There were interesting themes in the parent data. I observed them trying to interpret the information about progress that school was giving them, reporting difficulty to the reviewer, relating early narratives to contextualise the present, discussing their children's emotional wellbeing, wrestling with curriculum

options and career choices, and trying to understand and articulate the way their child learned and how they needed to support that. Like their children's interviews, the parents' contributions to academic reviews were all very different but they did afford the creation of some early cross case themes.

However, there was something fascinating in the parents' contributions that led to a new perspective unanticipated in my original conceptual framework: some of them were struggling to understand the learning process and found their child's learning unknowable whilst others could articulate a learning or problem-solving strategy designed to help their child. I realised that I needed to look at this theme in the parent data in more detail as the children who were struggling had parents who found the learning process mysterious, whilst the children who were making progress and feeling settled in school had parents who articulated learning strategies. Parents were no longer the passive providers of a relational context, distant from the cognitive and metacognitive that was the domain of educators, they were involved in the cognitive and metacognitive in a way that I had not anticipated.

The reviews also gave a temporal dimension to the study. In year 9 the participants were at Key Stage 3, still using primary school and transition as reference points to explain their learner identities and examine their experiences at school. By year 10, they were studying for level 2 external assessment, they had matured, and they were starting to consider life in the post-compulsory stage. There was only a 12-month period between the two reviews but for some the shift from Key Stage 3 to Key Stage 4 had been a

period of significant change. I have tabulated the main changes detectable in
the interview and school data in Table 3.7.

Type of change	Participant	Individual change
Reduction in effort	Ellie	Drop in effort grades and little progress attributed to increased difficulty of courses and distractions
	Alex	Drop in effort grades and slower progress attributed to lack of motivation and rejection of school
	Oscar	Significant under achievement not picked up in year 10 effort grades but clear in Predicted Grades
	Kai	Drop in effort grades and increase in behaviour incidents, decrease in attendance
Emotional distress	Beth	Upset and frustrated with English and French – asking for support
	Ellie	Significant change in wellbeing since year 10 – tearful in academic review and parents concerned
	Kai	Unhappy at home and school, struggling to cope with school routines
	Oona	Finds setbacks stressful / anxious
Strategic motivation	Andy	Focussed on subjects that will help him to progress to technical subjects post-16
	Alex	Concentrating on subjects he perceives as valuable to farming

Type of change	Participant	Individual change
	Lennie	Wants to pass entrance tests for Army Foundation College
	Oona	Wants to go into the military in the equine division
Intrinsic motivation	Beth	Loves mathematics and science
	Oscar	Loves art and drama
	Mary	Loves English and RPE – enjoys analysing and discussing texts and concepts
	Keith	Enjoys most of his learning (except French) and enjoys the feeling that he knows how to learn and can make progress
	Oona	Enjoys most of her options at KS4 – she chose carefully based on intrinsic motivation
	Vicky	Loves her options subjects – growing in confidence and enjoying seeing her strategies leading to academic growth
Disidentification	Alex	School is now something to be endured and has little relevance to the "real world" of farming
	Lennie	Treated like an adult in the workplace but a child in school – resentful of this. Confident of making his way after school.
	Kai	Prioritising friendships out of school – criminal activity
Academic growth	Beth	Achieving at the upper quartile in many subjects. Growing in confidence as a learner.

Type of change	Participant	Individual change
	Andy	Achieving good grades
	Mary	Achieving at the upper quartile and growing in confidence
	Keith	Achieving at the upper quartile and growing in confidence
	Oona	Becomes more confident learner and achieves well
	Vicky	Achieving at the upper quartile and growing in self-belief
Parental distancing	Ellie	Parents prioritise well-being and ask to discuss that with the form tutor at year 11 academic review rather than talk about her learning
	Alex	Parent did not attend year 10 academic review
	Lennie	No parental involvement in reviewing throughout school.
	Kai	By year 11 parent prioritising health, wellbeing and safety and reluctant to engage with discussion about learning. Decided to home educate to remove him from the community where he is at risk.
Parental support	Andy	Mother supporting various difficulties by acknowledging Andy's feelings but offering strategies to improve situations
	Beth	Mother working on self-belief along with resilience strategies and seeking support for learning
	Keith	Parents offering support with revision, encouraging high effort levels and

Type of change	Participant	Individual change
		measured in response to difficulty with French when Keith is not enjoying it
	Vicky	Parents attribute progress to high effort levels, strategise solutions to support Vicky through difficulty and encourage measured responses to stress
Parental frustration or difficulty	Ellie	Mother asks for test to see what sort of learner Ellie is, parents struggling to understand or agree Ellie's effort levels and responding to her distress
	Alex	Mother now distant but submitting complaints about the courses and teachers
	Oona	Father worried about her emotional well-being, mother frustrated with her literacy and organisation skills
	Oscar	Mother surprised that Oscar's predicted grades are low and worried that he will have to work very hard – she has always felt that his innate intelligence would result in excellent outcomes
	Kai	Mother becoming increasingly desperate about Kai's wellbeing – struggling with his condition and family dynamic – removes him from school to home educate him eventually

Table 3.7 Longitudinal change for individuals and cross-case themes

Individual case studies would help me to explore this temporal dimension afforded by the longitudinal nature of the study as it applied to the cases in

question. It was important, however, to look at what was changing in the learning trajectories of these participants and their parents and why.

3.6.2.3 Provisional codes and categories

Once I had collected the data from the Curriculum Interviews and the two academic reviews, I had a substantial amount of school and interview data and could start to build profiles of the individual participants, tracking their learning and lived experience of school to date. I also had cross-case themes worthy of further investigation. I developed the thematic coding emerging after the curriculum interviews by going back to the initial coding of all the interview data, checking every item was coded and drawing up a concept map. The map illustrates the complexity and detail within the data collected. The rectangular nodes on the map (Figure 3.3 Initial coding map) are the cross-case themes common to all the participants, whilst the sub-sets of oval nodes show the different responses to these common themes across the different participants. I have indicated with arrows where issues intersect across more than one common theme, for example "Struggling with subjects" and "Family influences" are both common themes that link to the sub-set "negative motivation".

Fig. 3.3 Initial coding map

At the initial coding and grouping stage it was already clear that for each
emerging theme there was a range of responses from the different
participants. To achieve the aims of the study, which were to see the extent to
which Implicit Theories of Intelligence were part of a complex picture for
children in secondary school, then it was important to develop themes so that
they were common threads that were taken up differently into the pattern for
each participant. The initial coding map proved to be a useful starting point as

127

it had already been possible to start grouping codes together as they coalesced around themes.

The second stage of the analysis was a process of looking closely at the webs of connections that appeared at initial coding stage and identifying the thematic reason for the massing of codes around key concepts and then underpinning each theme with the complete set of data extracts that informed it. I took each theme emerging from the initial coding map, representing it diagrammatically and analysing the data pattern in detail as illustrated in this example in Figure 3.4 of the thematic map for setbacks:
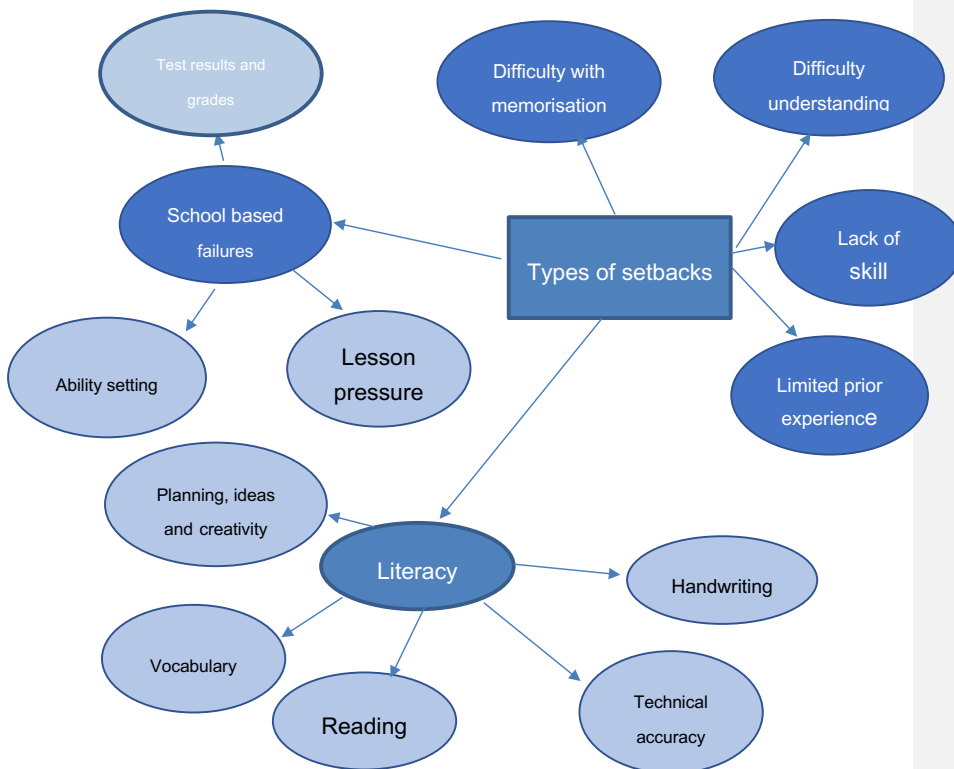
Fig 3.4 Thematic mapping of Types of Setbacks

Each key theme had a set of sub-themes, representing the responses of one or more participants. I had originally grouped resilient and helplessness responses together under the heading *Resilience* but later separated them into the two types of response. I also studied the *Types of setbacks* participants described in their interviews as this was quite a detailed and revealing aspect of their lived experience of school. I added this theme at this later stage. *Motivation* and the *Lack of motivation* also needed to become two different key themes, having been grouped together in the same category originally. There is a certain amount of overlap in this delineation of themes and sub-themes. Some of the types of setback also appear in the *lived experience of school* , whilst *family influence* appears both as a theme in its own right and also as a sub-theme in the themes of *Motivation* and *Lack of motivation*. This complexity serves to underline that, whilst it was possible to define key and sub-themes and impose some order on the data for the purposes of analysis, the inter-connectedness of the themes was significant, and this interplay needed to be explored in the case studies. Table 3.8 outlines the key themes and sub-themes identified at this stage of analysis.

Key theme	Sub-themes
1. Implicit beliefs and learner concepts	a) Mindsets b) Subject variation c) Learner images and models
2. Setbacks	a) Cognition b) Memory c) Literary

Key theme	Sub-themes

	(i) Planning, ideas and creativity
	(ii) Vocabulary
	(iii) Reading
	(iv) Technical accuracy
	(v) Handwriting
	d) Lack of skill
	e) Limited prior experience
	f) School based failures
	  (i) Test results and grades
	  (ii) Ability setting and lesson pressures

Responses to setbacks: effortful and resilient responses	a) Metacognitive strategies
	  (i) Seeking support
	  (ii) Trial and error
	  (iii) Transferring learning
	b) Self-regulation
	  (i) Spending time
	  (ii) Investing effort

Responses to setbacks: helpless responses	a) Anxiety b) Withholding effort c) Refusal/poor behaviour
Family influence	a) Inheritance narratives b) Community identity c) Gender d) Support for learning e) Wider access to learning
Motivation to succeed with learning	a) Family/ community relevance b) Enjoyment c) Confidence

Key theme	Sub-themes
	d) Competitiveness
	e) Strategic
Negative motivation/ causes of lack of motivation	a) Setbacks
	b) Family relevance
	c) Lack of interest in the subject
	d) Boredom
	e) Embarrassment
	f) Lack of strategic relevance
Lived experience of school	a) Prior experience
	b) Ability setting
	c) Assessments
	d) Comparisons with peers
	e) Lessons
	f) School and national level strategic issues

Table 3.8 Key themes and sub-themes for the second stage of the analysis

At this second thematic stage I was looking at the themes as they emerged across the data. The second dimension to the analysis, namely the relationship of each child to this thematic map, emerged through the case studies in Chapter 5. The thematic analysis confirmed that there were indeed two different dimensions to the study.

1. Cross-case study findings

2. Findings about individuals.

Firstly, it was possible to see that these children, with their shared experience of their school and their curriculum were discussing a set of issues that they

had in common in a shared context. They virtually all had something to say about setbacks and challenges, about their motivations, about family influences, decisions about effort, the extent of their metacognitive repertoires and their levels of self-regulation. Several talked in detail about the challenges involved in literacy, especially writing and with memorisation. Most referred to earlier educational experiences at primary school or around transition in order to account for the way they saw themselves as learners and some talked about the impact of learning with peers, whether they found that supportive or challenging. These were all strong threads that ran through this data set and suggested key themes worthy of investigation.

Then secondly, each data extract suggested that for each child there was a uniquely individual experience and response contained in their discussion of the emerging themes. Each child had a different combination of prior experiences: family influences; ideas about what they were good at and what was important to them; and each child had a different response to setbacks and difficulties. The themes were common threads, but for each child they were woven into a uniquely different pattern, which affected their trajectories through time.

3.6.3 Refocussing phase

I was intrigued by the way that the participants were searching for language, analogies, and models to articulate what they meant by intelligence and learning. The issue appeared as a sub-theme in Implicit theories and Learner

Concepts, but it also featured in the parent interview data. The way children - and indeed parents - described learning was revealing and there did seem to be a strong correlation between those participants who could describe learning as a process and those who struggled to say aloud what might be happening when they were learning.

I was also persuaded by the significance of a learner's metacognitive skills in resilient responses to setbacks and wondered if there was a connection between "Learning Literacy" (as I had started to describe it), metacognitive awareness, resilience and academic growth. I wondered about the role of motivation in this interrelationship too. The analysis was affording some insights into the mechanisms mediating between Implicit Theories and outcomes, allowing some light into the "black box" of learning.

Following the lives of 11 different children with different Mindset scores and implicit beliefs about intelligence was affording insights into the mechanisms that mediated between implicit theories and outcomes for these children: to peer inside the black box and perhaps isolate the key moving parts of the learning process. Thematic analysis was suggesting the importance of motivation, metacognition and self-regulation as possible critical components. The study started by asking questions about the relational and the social-emotional identities of learners which interact with learning. As the analysis progressed an even greater complexity in the relationship between the socially constructed selves of learners and their academic trajectories was hinted at and the role of families and communities were possibly more

connected to the cognitive than first realised. What can schools do to incorporate mindset theory into their work? The answer to that question includes pedagogy but broadens out to embrace far more, thanks to this study and its participants.

3.6.3.2 Six detailed case studies

The selection of 6 participants on which to base case studies needed careful thought. I wanted to make sure I had a range of abilities and mindset scores. I needed to think about gender balance, including children from both schools in the MAT and ensuring representations of learning difficulty, and different family and social backgrounds. Table 3.9a shows the selected participants matched against these criteria.

Pupil	gender	CAT Ave	Mindset Score	School	SEN	Pupil Premium?	Family
Beth	female	105	3	main		no	Professional
Ellie	female	103	4	main		no	Farming/ rural business
Alex	male	92	3.33	studio	SpLD	no	Farming
Oscar	male	127	3.66	main		no	Professional /academic
Lennie	male	89	2.33	studio	SpLD	Yes	On FSM
Vicky	female	110	3.66	main		no	Professional

Table 3.9 Case study participants: showing the range of pupils

Each case study used the research questions as their organising principle, accessing the detailed narrative afforded by the rich detail in each participant's interview data along with the school data on prior attainment, progress, and outcomes. These in-depth studies of 6 individuals explored the themes identified in the original analysis as they applied uniquely to each child's experience of school. In each case there was an attempt to identify the influences that feed into the learning "black box" before trying to peer into it to detect the way that learning mechanisms are working and inter-relating to produce identifiable outputs in terms of results, destinations, and well-being. The temporal element of these individual studies was interesting. Most participants drew on family narratives and earlier experiences to explain their learner identities. The interplay between the past and the present saw participants reaching back to the past to explain the present and seeing the past through the lens of the present to interpret phenomena.

I started to work with participants at an important time in their secondary school journey. They were choosing options for Key Stage 4 based on their thoughts and feelings about themselves as learners, their aspirations, and their experiences across the curriculum. The next two years saw them mature quickly into young adults, facing the reality of public examinations at 16 and choices about their futures.

As I examined the dynamics between their past experiences, family influences, lived experiences of school and their learner selves, I created graphic representations of those dynamics in their case profiles by way of illustration. Family influences and prior experiences had fed into the learner identities visible during the course of the study. The participants' learner identities were then affected by their lived experience of school. The process, represented graphically in Figure 3.5, was dynamic with the participants drawing on family influences and prior experiences to interpret their ongoing experiences and to change or to intensify aspects of their learner identities.
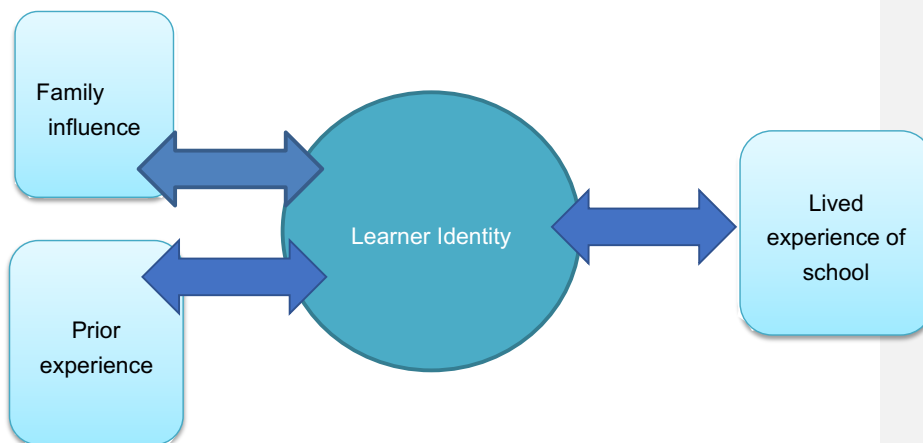
Fig 3.5 Graphic presentation of the dynamics within individual case studies

This conceptual framework allowed me to isolate several significant themes that helped to further an understanding of the complexity of the relationship between Implicit Theories of Intelligence and the learning experiences of adolescents in school together with some recommendations for ways for the profession to engage with the theories in education practice.

137

Chapter 4 Findings from the individual case studies

4.1 Introduction

This study has put Implicit Theories of Intelligence into the much wider, more complex and highly individualised contexts of identity formation and unique experiences of education. Hearing the voices of 11 very different children and their parents over a three-year period in the same school whilst tracking their progress allowed insights into how they constructed the learner identity of which Implicit Theories of Intelligence were a part. These longitudinal case studies also highlighted the contributions of families to both identity formation and to learning itself whilst affording a closer look inside the "black box" of student's learning in order to detect some of the moving parts of a mechanism that connected learner identity with learning outcomes.

Thematic analysis of the interview data for the whole cohort of 11 participants had led to the identification of key themes and sub-themes which then led to a refinement of the research questions (see Table 3.10 in the previous chapter). I used these research questions to structure the detailed case studies of 6 of the participants below. The case studies plot the individual trajectories and the unique profiles of these 6 different children who all bring their own learner identities to education and then interact in their own way with the lived experience of school. The cross-case analysis looked at the data from all 11 participants and their parents so that I could investigate the underlying dynamics of the different trajectories experienced by these children and start to find answers to my research questions.

Key:

(Yr 9 CI) – year 9 curriculum interview

(Yr 9 AR) – year 9 academic review

(Yr 10 AR) – year 10 academic review

4.2 Case study ALEX: I can do it, but I just don't choose to.

4.2.1 To what extent are mindsets binary? Are children simply growth or fixed-entity, or do mindsets vary across different activities?

When I first interviewed Alex in year 9, he self-identified as having a Growth Mindset. His score was borderline, but he was clear that he thought that when it came to developing your brain, "you work hard for it."

"You just have to get on to get your intelligence built up. You just have to work hard and not mess about as much." (yr 9 CI)

Alex's Intelligence Theory score and his belief in the importance of effort augured well when he was in year 9. Why, then, by the time he was in year 11 and the stakes had never been higher for him, was Alex struggling so much to commit to even the most basic of studies?

4.2.2 Do Implicit Theories of Intelligence have an impact on school outcomes such as grades and destinations?

Alex was more or less on track for his DfE median grades, but his teachers were recording a decline in effort in year 11. This was a concern as he had

never been awarded an effort grade average that even approached the 3.82 the school set as a benchmark correlating to attainment above the median, and the dip in effort recorded during year 11 could well be an indication of outcomes below the median. In Alex's case this could be problematic: high effort levels could give him a chance of achieving the upper quartile predictions of a grade 4 or "standard pass" in his GCSE English and mathematics but as things were this was unlikely, and he would need to re-sit both subjects at post-16. This was the last thing Alex wanted. As he said in his year 10 Academic review, "Once I'm out of here, I'm out." Why was it that,given such a clear motivation to pass at least these crucial subjects, he seemed to be struggling to engage with learning? As he said himself, "Yes, it's worth it. Then I'm out," and "I want to do it." And yet his behaviour log showed an increase in disruptive behaviour and concerns about a lack of engagement in the classroom. In his year 10 academic review he reassured the reviewer that even though he had done virtually no work for his year 10 examinations he was determined to make more effort in year 11: "Especially when my big exams are coming. I will do a lot more. A lot of revision." And yet, with a matter of weeks to go before these "big exams" Alex's teachers were predicting that he would get grades 2 and 3 in all his subjects meaning he would most certainly need to re-sit both English and mathematics once he had left school and gone onto an apprenticeship.

Sadly, Alex's grades were all 2s apart from a 3 for one of his sciences: he underperformed at GCSE and achieved well below his DfE median targets.

Why had this strategic goal of passing his core qualifications in order to be free of further classroom study not been enough for Alex to stay on track?

4.2.3 What are the processes that lead from Implicit Theories of Intelligence to school outcomes?

There was something that was fundamentally about Alex's personality at work with regard to learning: his determined exercising of choice, particularly the extent to which he calibrated his effort level and his behaviour. He talked about not messing about "as much" when explaining his mindset and its correlation with behaviour and effort decisions. In English: "I don't put too much in, so I don't enjoy it - I put the right amount in, so I enjoy it as well." He thought he was working hard enough to "get far" (yr 9 CI). Alex was honest about calibrating how far to go with distracting behaviour in Theatre Arts: "we only take it to a certain spot because if we mess around, we know he's going to shout at us and so we stop" (yr 9 CI). So, Alex controlled, calibrated and compromised to get a balance between enjoying himself and learning – or between enjoying himself and getting into trouble. He was very clear about the subjects he was prepared to make effort in and the subjects that he was not interested in. He had decided to try harder in mathematics,

> because you need your maths I don't want to carry on doing it because it's a shame if I don't pass it and I have to keep doing it - just to say I messed around in year 9 and because I don't listen. (yr 9 CI)

He also made choices about which teachers he was going to work and behave well for, based almost entirely on their willingness to know him, and understand his life outside school: "You feel like I like this teacher, they

141

always talk to me, so you like the subject a lot more and you listen more" (yr 9 CI). Even though English was the subject he struggled with more than any other his year 10 teacher has managed to connect with Alex, "I always tell him about my farming you see, he likes it" (yr 10 AR). Alex exerted considerable control over his learning. He calibrated effort, decided what was relevant to him in what was on offer at school on his own terms, decided which teachers he was prepared to work for and decided what he was not prepared to do in the face of adult persuasion: "I choose to write but I don't just choose to read, because it doesn't interest me at all" (yr 9 AR).

For Alex, the processes that could lead to academic growth were dominated by his desire to exercise choice on his own terms. Motivation was rarely intrinsic in response to interest in or enjoyment of an area of the curriculum. When it existed, it was either extrinsic because of a subject's perceived usefulness to a life in agriculture or it was relational whereby Alex entered a "contract" to make some effort for teachers he liked. Without intrinsic motivation or any sense of enjoyment from learning in the classroom, Alex struggled to self-regulate and was somehow unable to approach learning with any degree of metacognitive understanding. By year 11 school simply was not for him and he was biding his time to get to the farm.

4.2.4 To what extent are there more complexities involved in the translation of Implicit Theories of Intelligence into outcomes? e.g., the social and reciprocal nature of education, or the role of communities, families, and parents?

In Alex's case there was a very strong narrative to his life outside school. So strong in fact that at one point he was adamant that school was a distraction from the serious business of getting on in the life he has chosen: farming. Alex's family are Cumbrian farmers who can trace their connection to their land and their way of life through generations. "School is only like six years of your life. You have to think outside of school, not just school" (yr 9 AR). Much -probably all - of Alex's view of what he was taught at school was coloured by the notion that it was not relevant to his aspiration to farm.

Alex found it difficult to see the connection between what he was being taught in school and a life on the land. As early as year 9 he could see the importance of mathematics. "you need your maths in life". He was less convinced by history though, "I don't see why we have to learn about it". He chose Geography as a GCSE option as "it's outdoors and it's all about the countryside and maps" (yr 9 AR). His mother commented that he enjoys science because he could relate to the experiments and Alex again made the connection between a subject and its directly practical application to his farming ambitions: "Chemistry I do it, but I need it, when I'm out there, it's mixing the chemicals for the spraying" (yr 9 AR). I was struck by his expression "out there" to describe his future on the farm with its connotations

of escape and adventure and the sense that it was an entirely different space from school.

When it came to reading, however, he was adamant that there was no point: "Books aren't really going to change my life. I do sports and farming and then I've got sports and other stuff like. Reading is not most important" (yr 9 AR). He was particularly opposed to fiction. When his mother told him that he would need to be able to read if he wanted to farm he was quick to answer, "Yes, I know you need to read, but you don't need, say you read something about dragons, what's that all about?" (yr 9 AR). At a later point in the conversation his mother tried again, suggesting that he would need to read the label on a chemical: "Of course I can read the label of a spray." The debate continued with mum and reviewer joining forces to persuade Alex of the importance of reading development. Alex had the last word though: "I can read. I just choose not to read." This underlines an earlier and rather dramatic digging in of heels: "If someone paid me a hundred quid I wouldn't do it!" (yr 9 AR). This is an unusually strong reaction: was there more to it than a concept of relevance?

Alex had a Support Plan, which aimed to remove some of the barriers to learning Alex experienced due to his dyslexia. It recommended reducing the amount of writing required in class; scaffolding extended written tasks; avoiding copying from the board; supporting the recording of homework tasks; and directing him to Learning Support at lunch time for additional support.

How did his SEN impact on his approach to his learning? Both Alex and his mother recalled that he was managing quite well with literacy related activity at primary school: "Until you came to high school you probably had the neatest handwriting in your school" (yr 9 AR). He didn't mind reading as much at primary school either: "Primary school was alright. The books were alright" (yr 9 AR).

Alex thought a deterioration had happened because "a lot of teachers rush you". One of his English teachers gave him longer than the others to write in class so that "my handwriting bit is better in his book" (yr 9 AR). According to Alex, teachers' adoption of the suggested strategies was inconsistent. He reported that he did get copies of notes but not much scaffolding of writing tasks happened, that he did have to copy from the board, "quite a lot of the lessons, nearly every lesson we copy from the board". He said that he did not get much homework, "usually if I do get homework, I do it, in the lesson I have" (yr 9 AR). Finally, he stopped accessing support at lunch time preferring to, "walk around school, go on the field."

By the end of Key Stage 3 he was a whole grade away from his predicted level in English explaining that, in his year 9 examination, he was aware that he might have made errors but, "I don't read through it you see. Once I've finished, I've finished. I don't read through it" (Yr 9 CI). And the reason he never did any proof reading? "Because I always find something what doesn't make sense and then it confuses everything if I need to change it" (Yr 9 CI). At his year 10 academic review we discussed how his difficulty with writing at

speed was affecting his progress in geography: "It takes me a bit longer that everyone else to write things down and I don't think he just quite understand that and he's always shouting, "come on in two minutes". I just can't do it in two minutes" (yr 10 AR). He reported a similar difficulty with pace in physics: "Mr - is just going too fast and I don't really understand it" (yr 10 AR). So, Alex continued to experience difficulties with reading and writing and only some of his teachers accommodated these difficulties.

Alex's mother had clearly had an early conversation at secondary school: "I can remember mentioning you know, it was a discussion when we first came, that it was time" (yr 9 AR). Alex himself, however, seemed unaware of both his dyslexia and the existence of a plan to support him. When the reviewer referred to this he asked, "What does that mean?" The responses from both Alex and his mother to the issue of his literacy difficulties were slightly unusual. Mum seems to have an awareness of Alex's need for additional time when completing tasks but had engaged in very limited dialogue with school about it. Whereas Alex seemed to have a limited grasp of the impact his difficulties were having on his learning beyond having to rush and having untidy handwriting.

The reviewer asked Mum to say something about how Alex learns. Like several parents in the study, she had picked up on the debunked theories of VAK learning (Visual, Audial, Kinaesthetic) which was trending in some of the feeder primaries several years ago. She described Alex as,

"A visual learner. You can tell him until you are blue in the face but if he doesn't see it, it doesn't work. Visual." When asked if this reluctance to engage with literacy goes back to early childhood Mum commented, "Yes. That's nothing new. Sadly" (yr 9 AR). Mum seemed to have struggled to get Alex to engage with literacy and learning since early years. The conflict between them was evident in the "stand-off" they have around reading in the academic review and in mother's resigned tone. Alex had already hinted at his own attitude to his mother's efforts with him during the curriculum interview. He said his mum "keeps nagging at him" to read books and he responded that sometimes: "when I'm having my brew in the morning I read the Farmer's Weekly or the Guardian – it just depends because they come on a Friday" (yr 9 CI).

It was possible to suspect a gender stereotype threat in Alex's attitude to literacy and other aspects of school that could conceivably be associated with female domains. Whilst he regarded his mother's efforts to encourage him as "nagging" there was no mention of male interest in his learning in any of the interviews other than to describe his grandad as "a good drawer" before describing an activity that he valued: "so I've got his ideas - I'm a good drawer as well." He compared his interest in history to his sister's: "My sister used to come home and watch *Horrible Histories,* but I didn't like it. I just don't understand it" (yr 9 CI). In his year 10 academic review he discussed watching his older sister revise for her GCSEs: "That's the issue, I've seen her doing all the revision" (yr 10 AR). When the reviewer suggested that you

need reading skills so as not to be taken in by fake news Alex replies quite angrily, "What about girls, they make a load of rubbish up" (yr 9 AR).

There seemed to be a rather strong triumvirate of issues working together in Alex to generate an unusually strident refusal to engage with key aspects of learning at school:

- Difficulties with reading and writing suggesting dyslexia
- A gendered view of literacy and much school-based learning as feminine
- A view that school has little to offer him in preparation for a practical career in agriculture.

It was interesting to ask about the extent to which Alex's very determined stance emanates from the difficulties with literacy that were then compounded by the family narratives around gender and learning to give him the internal arguments he needed to resist attempts to get him to engage.

How did this unique learner identity translate into actual learning? How developed were Alex's learning strategies? The simple answer is that Alex had a naïve and quite undeveloped understanding of what effective learning actually looks like.

In year 9, Alex described effective learning as "concentrating", describing his ineffective learning in mathematics as a set of classroom behaviours: "I messed around in year 9 and didn't listen and I wasn't paying attention." He referred to effort on several occasions without actually articulating the nature of his effort: "I try hard, but I always end up making mistakes."

"I just work hard, and I seem to get far," and "in Chemistry I get on like do well like I get on with my work" (all yr 9 CI). In his year 9 academic review the reviewer asked him what he could do to improve his progress in geography, and he replied, "I don't know really." When pressed about the amount of revision he did he admitted, "A bit, I could of done more" (yr 9 AR). He was resistant to revision, deflecting attention away from his own performance: "Yes, I could have done better. Everyone can do a bit better if they try harder." The reviewer tried to pull him back: "Yes, but I'm talking about you!" (yr 9 AR). At which point Alex started to give one-word responses.

By year 10 Alex was still describing the more effective learning he knows he needs to achieve as, "A lot more revision and listen a bit more in class." "I just need to focus, get everything wrote down from the board." And then, tellingly, "I just don't know where to start." "I don't know which poems I should be learning. I don't know a good technique of writing." The reviewer asked if there were a strategy he could use: "he said if I was struggling, go and see him. But I should have gone and seen him, but I didn't" (yr 10 AR). He was disappointed with his mathematics assessment: "Maybe I should do a lot more of good revision, instead of just a quick look through." In science, "I think it's more that I need to get on straight away with it." And when it comes to consolidating learning, "I just don't do anything really. I should…. look through my book or go and see a teacher." In geography he said he could improve if he decided to, "Not mess about in lesson but make it so I concentrate" (yr 10 AR). He admitted, "I didn't do any revision really. Well for my maths and English I looked through my poems and that was maybe

149

like five minutes or something" Finally, he admitted that he struggled to motivate himself: "say it's farming, I'll do it straightaway. Don't think I'm not keen on doing it, I just find it hard to get on and do it."

He also talked about starting with a strategy to improve organisation that he does not manage to sustain: "My organisation skills are all over. Ever since I started year 10, I'm packing my bag in a night before I come to school then I don't know what happened. I just got out of the routine and started packing it in the morning." He then admitted, "You can get away with it in year 9 but now you can't. It's getting harder" (yr 10 AR).

As with several pupils in the cohort, the learner identity and any attendant strategies adopted by the end of Key Stage 3 were not enough to cope with the increased demands of un-tiered linear assessment systems with harder content that make higher demands on students' organisation, self-regulation, and metacognitive strategies. In Alex's case an assertive boy, with ready-made internal reasons to reject much of what school has to offer in order to avoid difficult challenges like literacy and self-regulation exacerbated by unmet learning needs, found himself facing the last thing he ever wanted: the dreaded English and mathematics resits. He did have an apprenticeship lined up and will undoubtedly enjoy that and do well in his chosen agricultural career but perhaps we should leave the last word to Alex:
"I said to my mum, I want to finish school, but she said you have got a lifetime to work" (yr 10 AR).

4.2.5 The one-shot interventions around mindsets create marginal impacts that are difficult to sustain: what CAN schools do to improve the learning experience and outcomes for children?

The four main complexities that meant that Alex struggled to achieve academic growth during his secondary schooling point to strategies that schools could adopt to improve the learning experience for students like him. Schools can work with communities to communicate about a curriculum that meets their needs by valuing the learning they require to sustain them and affording that learning parity of esteem. Alex struggled to see the relevance of much of his curriculum and directed his efforts to learning outside school. Alex needed to be supported as he transitioned from primary to secondary school when the change of pace meant that his delayed literacy development hampered his progress. This is linked to his SEN which was poorly understood by him and his mother who struggled to help him to engage with support and adopt helpful strategies.

Finally, neither Alex nor his mother had an understanding of the learning process itself. A clear description or model of learning, shared by Alex, his family and his teachers could have helped him to move beyond the idea that learning was more than behaving reasonably well in a classroom and to embrace the idea that he could achieve academic growth.

Figure 4.1 illustrates the dynamic relationship between family influence, prior experience, current lived experience of school and Alex's learner identity as detected in this case study.

Family influence
Strong tradition of farming shapes Alex's sense of current and future self
Literacy appears to be gendered
Mother tries to encourage him but faces strong opposition

Prior experiences
Primary literacy was manageable: there was more time to write
Transition to secondary led to rushing
Support plan does not seem to have been understood by Alex

Learner Identity Paradigm
Borderline intelligence theory – you have to work for it
SEN – literacy difficulties associated with dyslexia, not fully understood by Alex or Mum
Very strong locus of control within Alex who calibrates effort and behaviour according to his own view of relevance, stereotype and enjoyment
Needs to be known and valued as from the farming community

Current lived experience of school
Inconsistent approach to learning difficulties
Relationships with teachers are good if they know him on his terms
Prioritises social time
Specialist vocational pathway but widening gap in KS4 core subjects
Organisation and self-regulation have not developed: limited metacognitive development
Challenging behaviour when frustrated with learning -receives sanctions
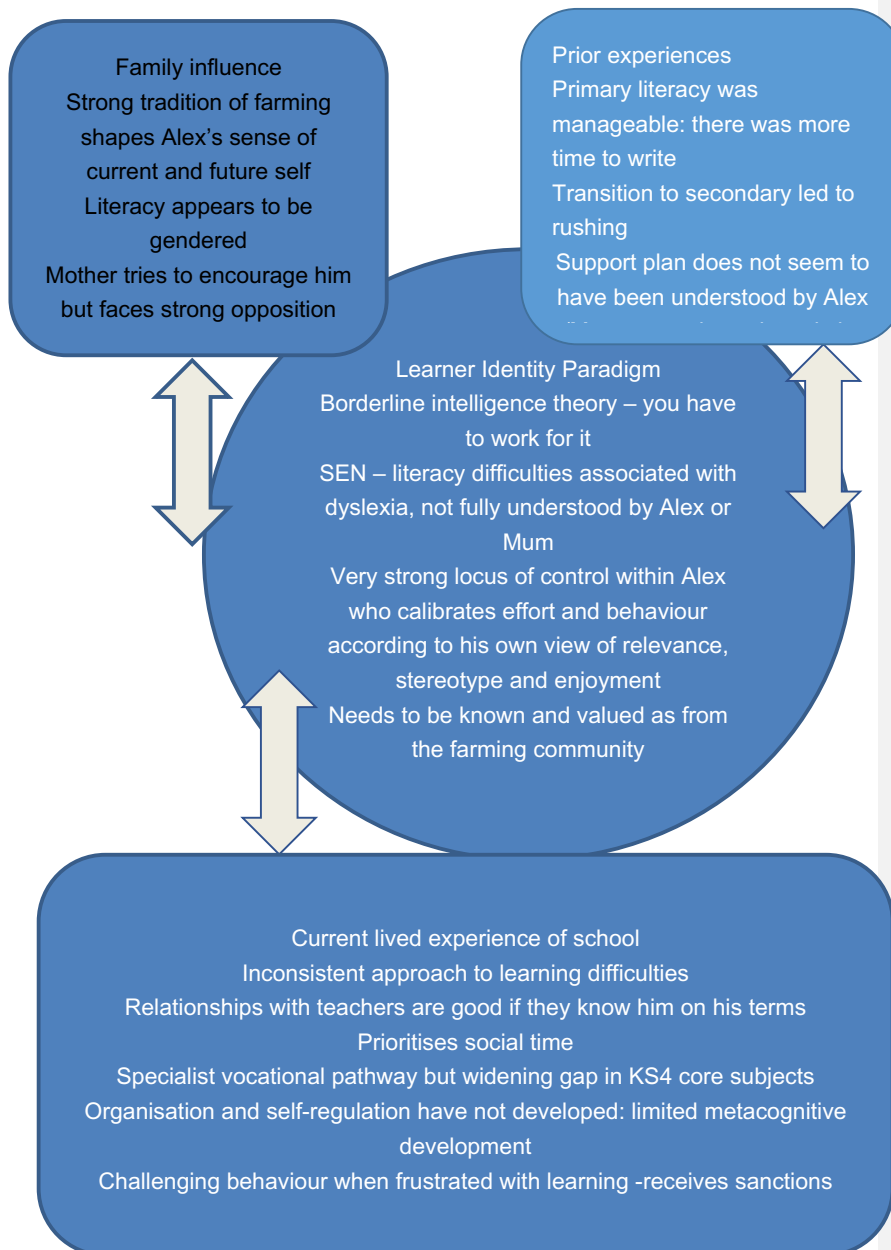
Fig. 4.1 Illustration of the dynamics in Alex's case

152

4.3 BETH - "I can't take my own advice"

4.3.1 To what extent are mindsets binary? Are children simply growth or fixed-entity, or do mindsets vary across different activities?

Beth worked hard. Her effort grade averages were consistently higher than the school's "magic number" of 3.82 which correlates to enough hard work to achieve in the Upper Quartile at GCSE. Therefore, she seemed to be rather different from the classic fixed entity self-theorist. She scored 3 on Dweck's simple Intelligence Theory questionnaire, which put her firmly into the group of learners who believe that intelligence is fixed and unlikely to change with effort. Dweck argues that these fixed entity theorists eschew effort, as they fundamentally believe that there is little point to it: "If you withhold effort and do poorly you can still think highly of your ability" (Dweck, 2006). Beth did not think that she should withhold effort though. In her year 9 semi-structured curriculum interview, she made strong claims for the role of effort in her own approach to her studies: "When I work at something it makes more sense in a way so I challenge myself and it like grows my mind" (all from year 9 curriculum interview: yr 9 CI).

The problems happened for Beth, however, when she was facing formal assessment, particularly tests and examinations when she often reported feelings of panic and fear: "I panic about it and I don't stop panicking about it" (yr 9 CI).

"I was really scared about all my exams" (yr 9 CI). Why did this fixed-entity theorist demonstrate apparently contradictory tendencies when it comes to effort? And what caused her strong feelings of fear when it comes to assessment?

When I asked her if she thought she was an incremental or fixed-entity theorist Beth was quick to tell me that she had a growth mind-set, "Because you can always change what you think and expand what you're learning by going over stuff you've already learnt" (yr 9 CI). This in spite of the fact that her answers on the Dweck Intelligence Theory questionnaire placed her firmly in to the fixed-entity category. So, Beth believed that intelligence was fixed and there was little she could do to improve that at the same time as believing that she could somehow succeed in education with hard work. The tension between these two beliefs in the interviews - indeed in Beth's demeanour and well-being - was palpable at times. When she talked about her ability in her year 9 curriculum interview she tended to be self-deprecating:

"I'm not the best artist."

"I'm not the greatest historian either."

"I wasn't the best at Chemistry in year 7" (all from yr 9 CI).

Her use of the negative with the superlative was consistent and thus quite interesting. She could have adopted a colloquial turn of phrase in order to express that she has moderate to low competence beliefs about a range of school subjects in this interview, but I wondered if she was unconsciously putting herself into a hierarchy within which she identified that other people

had more ability than her. In three interviews over an 18-month period Beth never said she was good at any of her school subjects until, after the year 10 internal examinations when she was more than a year older than she was in the curriculum interview, she accounted for her success in Business Studies – "I didn't think I would be very good at it" – with the following explanation: "I'm quite good at arguing. Arguing the sides of why she should or not. I can write about it quite well. I think that is what helped me with my business, because I got the long writing bits right" (yr 10 AR). Her mum had noticed Beth's tendency to low competence beliefs too:

"You think you are not every good at things, but you are actually better than you think you are" (yr 9 AR).

Beth often talked about an academically successful cousin whom she seemed to use as a reference point for intelligence: "my cousin did well in her GCSEs. She came out with eleven A stars and she's just been offered a place at Cambridge for veterinary medicine" (yr 9 CI). She talked in detail about her cousin's rigorous revision regime. This cousin used post-it notes stuck around the house to help her to memorise information. "She was revising a good year before her exams so they were like everywhere" (yr 9 CI). Beth seemed to take two important ideas from her family's narrative about this cousin. The first, that GCSE grades have important status in terms of demonstrating ability and the second that able learners work hard. Beth seemed willing to emulate the mastery-oriented approach of her cousin even though her own self-theory told her that her intelligence was a fixed and immutable commodity. Beth accepted an incremental approach to learning when she needed support to

155

improve: "so I'm going to do and see my maths teacher". However, she quickly added that the real problem for her was, "if I was to get a low mark and I wasn't happy with it it's not something I can change". She clarified by saying, "I also get scared because it's out of my control once I've done it. I can't change it and it's not like I can redo it". She wasn't comfortable with year 9 examinations being mid-year "because to me it's like this is my end of year grade if I don't well in this then my end of year score's going to be rubbish and I'm not going to get my target and my predicted." So that end of year summative, formally assessed grade had real significance do for Beth. It defined her in the way that her cousin's eleven A star grades defined her within the family.

So much of Beth's interview data deals with effort, anxiety, and performance goals but a rare glimpse into something more intrinsic made me want to discover more about what, if anything, Beth really enjoyed about learning. Her response was surprising: "I like learning about different countries…. It's like cool in a way. It's like different insights of how people live" (yr 9 CI). This interest had carried through into her GCSE Geography, which was going well, "I just really like it" (yr 10 AR). But progress had stalled somewhat in GCSE French unfortunately. This was such a shame as in year 9 Beth was very motivated by her enjoyment:

> I like French. I like languages. I like learning something else…. I
> realised that once you've learned the skills to do a language you keep
> the skills to learn other languages so now I really like French. (yr 9 CI)

It was when Beth talked about her early secondary experience of mathematics that she talked about enjoying learning for its own sake. A trainee teacher had introduced her class to the history of mathematics, and she had researched Pythagoras: "it was more like history in a way." She had clearly enjoyed this: "it's good to see in a way they teach differently" (yr 9 CI). A year on and in her year 10 academic review she was enjoying mathematics because she felt confident, comfortable and could see she was making progress. She was liking geography because, "I just love going in and getting all the sheets. When I come to revise it's just nicer because it's all there and colour coded bits" (yr 10 AR). She was even enjoying her separate sciences, in spite of panicking about short lead in times for examinations. She was reassured that her peers were also saying "that this is one of the hardest one they have done, they couldn't finish it" and was able to say, "I really enjoyed science this year." However, the intrinsic love of learning about other cultures was not expressed in her year 10 review. Instead, Beth talked about her occupational goal, "I think I want to go down the medical side of things, so either a doctor or a nurse, I think that's the way I want to go."

There were underlying tensions in Beth's learner identity arising from her early experiences and family context. She saw academic performance as expressed by grades and high-status progression as very high value but did not have an implicit theory that intellect is malleable. Rather the brain was a container you have to fill with effort. Positive early experiences around mathematics and languages had, however, given her clear evidence that metacognitive strategies do actually support learning and that she could

improve her performance with this type of intervention from good teachers. She did not seem able to come up with her own strategies, however. Her lived experience of secondary school had then proceeded to impact on this conflicting set of theories: good metacognitive strategies embedded in good teaching had helped her to move towards more of a growth mindset in several areas of her curriculum but high stakes testing and instances where the teaching has been less focussed on metacognitive strategies had served to reinforce her anxiety around her performance goals and undermine her developing resilience, motivation and engagement in these areas.

Beth started out with a belief that intelligence is fixed, and that she was not as intelligent as others in her classes or indeed her successful cousin. However, she also had a counter intuitive belief in the value of effort and resilience in order to fill up her brain with knowledge and skills, particularly when it came to performing well in tests, the method through which she sought validation. Her mindset varied according to context and depended on her being able to develop metacognitive strategies within a curriculum area. She relied on skilful teaching to "see" those strategies first.

4.3.2 Do Implicit Theories of Intelligence have an impact on school outcomes such as grades or destinations?

The main focus for Beth's hard work was examination performance and the resulting grade validation. She adjusted her view of her own ability when she achieved good examination marks for physics and computing. I asked her to

tell me more about what examination marks meant to her. She explained that she was quite happy to do a mini-quiz in French: "it wouldn't worry you because it's just on a scrap piece of paper that they throw in the bin so it's like for you to know".

However

> when the big booklet comes out and I just get all panicked when I see the big booklet. If it was just a little quiz, I wouldn't fuss about it I'd just learn it. (yr9 CI)

She emphasised the strength of this anxiety by saying "I panic about it and I don't stop panicking about it". When I asked her what she worried about she gave a stark answer: "getting it all wrong". Before she continued with her explanation though she shared with me her mum's advice about coping with this fear: "she said well you do what you can and if you do get a bad score and you're not happy with it then you go and ask your teacher how you can improve" (yr9 CI).

Throughout Beth's time in school her effort grade average was consistently above the 3.82 recommended for students to achieve their upper quartile targets and her eventual GCSE outcomes were impressive. She did indeed achieve at that level, going on to sixth form to study for A levels. Significantly, however, Beth still struggled with anxiety around her self-belief, constantly striving to manage negative emotions whilst determined to approach her studies with high levels of effort.

4.3.3 What are the processes that lead from Implicit Theories of Intelligence to school outcomes?

Beth was clear about the strategies she needed to prepare for examinations. In this she was unusual compared with many of her peers who were still coming to terms with the demands of high stakes testing in the new secondary curriculum in England. In her year 9 curriculum interview she described her revision regimes: "I'll keep going at it and I'll keep reading over my notes……I'll start three weeks before" (yr9 CI). She had mastered some examination technique too, even by year 9: "I didn't leave a question. I don't like leaving questions. Even if I don't get it I'll have a go at it" (yr9 CI). So, Beth revised effectively and could describe her strategies. The problem she had was believing that she had managed to learn the material she needed to before an examination, in other words she struggled with the self-monitoring stage of a well-developed metacognitive strategy: "the thing is I DO know it I just doubt myself in knowing it." When she solved a problem in an examination she said,

"You can get it right; it just looks like you've got it wrong" (yr10 AR).

Beth seemed to struggle to judge the accuracy or quality of her own work, especially in examinations. Was this a function of her over-reliance on the validation of teachers' formal, summative assessment of her work which in turn restricted Beth's development of self-assessment skills or even confidence in her own judgements? She seemed to have handed over the majority of authority for judging the quality of her learning to external agents,

particularly teachers. There was quite a debilitating level of self-doubt here that created an emotional response. Her Mum described it quite graphically in her year 9 review: "Before you know it you are all consumed by the fact that you are not actually going to be able to do it. When you can actually do it" (yr9 AR).

When Beth talked in more detail about this in her year 9 curriculum interview, she made the tension between her thoughts and her emotions clear:
"I tell everyone else as well not to panic about it, but I can't take my own advice" (yr9 CI). Strip away the high stakes testing though, and Beth became less anxious and more focussed on her learning so that she could start to enjoy it. She preferred the low stakes testing in French when the scrap of paper went into the waste bin at the end and did not continue to exist as a judgement about her worth. She also preferred the non-linear and incremental assessment of the geography department's "Star chart", "because you can see what you've done well" (yr 9 CI). She found this mapping of progress across different aspects of a subject supportive and made a case for its development in English, mathematics and RPE. This non-linear mapping of progress was not threatening to Beth, probably because implied in the assessment model is the notion that there are areas you can improve on if you work on them so that your current status according to the model is not the final outcome for you. It also articulated a metacognitive strategy by showing what she needed to do next in order to improve. In these examples of effective formative assessment, the impact of thoughtful teaching staff and the resulting practice on Beth's self-concept were visible. To what

extent did skilful teaching lead to an improvement in her efficacy beliefs? She talked about the help she received from her English teacher:

"I was comma splicing a lot in one of my pieces and I was talking to my English teacher, and we talked about how I could stop that." In Spanish,

"I went back at lunch time and went back over the Spanish piece to see where I could improve so a lot of it was just like spelling of words and stuff" (yr 9 CI). She felt that her year 10 mathematics teacher was effective: "The week before he got a book and everything we needed and gave us practice questions so I was just ready for it when I went in because he helped us so much."

I asked her how she dealt with getting things wrong in mathematics and she said she felt safe: "If you get something wrong, you don't feel like something bad is going to happen" (yr 10 AR). French GCSE was a different picture though. Her confidence was low in this subject and she compared herself to her classmates: "I just struggle to learn it. I do it then and then I review it but when it comes to the lesson everybody else is on it, but I take a while" (yr 10 AR).

By year 10, however, Beth was talking confidently about most of her GCSE subjects and showing less of the anxiety she displayed in her year 9 interviews. The only subjects she felt insecure about were French and English where she did not seem to have had any guidance about how to revise or how to improve: "I'm just not improving really with English. It's just consistently the same, and nothing is getting any better. If anything, I'm probably getting worse" (yr 10 AR). Here was the impact on Beth of her lived experience of

162

school. Information about progress, the impact of teaching, and her experience of lessons were all affecting her efficacy beliefs. When the conditions were right, as in mathematics, Beth had her " best year" but when she was left to struggle without structure or clear information about how to improve, as in French, Beth displayed the helplessness that Dweck describes as typical of a fixed entity intelligence theorist: "a lot of the time in French, I will have to go back to clinic and then I have to re-sit it and then I have to re learn it, but it just doesn't really work" (yr10 AR).

By year 10, with maturity and good teaching, Beth had gained some confidence around learning and felt more reassured that she could improve. However, when this quality of classroom experience and pedagogy was not there for her, she struggled to move on in her learning and became despondent. Could it be that fixed entity learners like Beth have much to gain from positive lived experience in school, supported by teachers who inspire her confidence, and who can scaffold metacognitive processes for her, and whose low stakes formative assessment methods allow her to measure her progress in a helpful way? Could Beth's story also be telling us that without these positive school experiences, managed by skilful and supportive staff, the fixed entity learner can easily "revert to type" and display signs of helplessness and negative responses to setback and difficulty?

4.3.4 To what extent are there more complexities involved in the translation of Implicit Theories of Intelligence into outcomes? e.g., the social and reciprocal nature of education, or the role of communities, families, and parents?

Early on in her first curriculum interview Beth referred to setting as a way of gauging her ability relative to fellow pupils:

> In maths, I wasn't in set 1 last year but now I am, and I may find it more challenging, but I prefer the challenge to when I was in set 2 I found everything quite easy.

> In English I was in set 1 in years 7 and 8 but I was getting to the point where I knew that I wasn't as good as everyone else around me, and I knew for myself that I was finding it TOO difficult. (yr9 CI)

Beth seemed to be happy in a set provided she felt that she could keep up with her peers. She used setting as a gauge of where she was in terms of a hierarchy of academic ability within the school but without any real concept of her cohort sitting within any national, external context. She relied heavily on summative assessments, mainly tests or main internal examinations, to tell her how "good" she was at a subject. She initially felt that she was not getting far with her physics even though she was working hard. She expressed her low competence beliefs, "I've never been very good at it" and then was surprised by her creditable examination score of 36 out of 42: "I did really well so I realised that I was better at it, that I was making more progress than I thought I was" (yr 9 CI).

Similarly, she felt that she was struggling with computing - "I did find it difficult, and I did have to revise quite a lot for it like weeks before" – until her score of 90% in the examination gave her the confidence to tell me she needs to change her description of computing as a subject she finds hard.

These two discussions about physics and computing are worthy of further scrutiny. Beth changed her view of them as subjects she found hard once she was awarded high grades in summative assessments. She did not attribute her success in them to the obvious effort she made to overcome her difficulties but shifted her view of them from subjects she found difficult to subjects she found easy. I asked her to describe how she had overcome her difficulties in order to succeed in these subjects and she went into detail about her preparation. In physics she explained, "you got your revision guide that you got e mailed and I still had my books to revise like and I read what was on the thing and you had to tick it and I was looking over my work" (yr9 CI). And computing was "just loads of numbers and when it's set out like it is I just got really confused so I had to work harder than probably some others would to get to know it" (yr9 CI). This seemed far from a helplessness response.

Beth had clearly worked hard to overcome challenges in these difficult subjects, but she did not attribute her success to her efforts or, perhaps more tellingly, her strategies. Instead, she assumed that her summative assessment scores demonstrated that she has ability in those subjects after all. In this aspect of her learning, she did seem to align with Dweck's description of fixed-entity theorists in that she prioritised performance goals over mastery goals. It was interesting to investigate the narrative that led to

165

Beth holding the two opposing views that caused her so much anxiety: that intelligence is fixed and can only be validated externally versus the notion that successful learners work hard to fill up their memories.

The family admired and valued the successful and hardworking cousin with her 11 A*s at GCSE and her place at Cambridge University. In the two academic reviews, Beth's mum revealed the level of importance she placed on Beth's academic performance. She started the year 9 review by admitting that she was thinking about Beth's progress chart, "whilst I lay in bed last night." She gave down to earth advice to Beth about effort and resilience: "Just go and ask them if it is wrong or not," and "If you've got it wrong you just learn from how you got it wrong" (yr 9 AR). Mum was very aware of Beth's anxiety around examinations, however, "She does study but then it comes to the night before and she forgets everything because she is in a panic." She seemed to have an intuition that Beth's implicit self-theory is connected to the anxieties she sees at home: "A lot of it is self-belief I think" (yr 10 AR). Thus, we had strong support at home for effort and the development of resilience, allied with practical advice: the advice that Beth struggled to give herself, however.

In her year 9 curriculum interview Beth talked about her early learning experiences at primary school and transition to secondary school and revealed how they had shaped her self-concept. She was surprised that she loves mathematics now because, "I remember in primary, in year 7, I hated

maths," she remembered, "I was never any good at fractions and I got extra help at primary school with some maths." This extra help was effective: "she explained it in more of a way that I would understand it once I made the link I got it and we were good" (yr 9 CI). Could this early positive experience of adapting metacognitive strategies with the help of skilful teaching have sown the seed for Beth's willingness to work with structured support and her trust in the process? It was interesting that mathematics was later her favourite subject, and certainly the one in which she felt she was most successful. By seeing that her effort, when complemented by the strategies supplied by a helpful teacher led to understanding is Beth able to experience the malleable, incremental learning that is the implicit belief of a child with a growth mindset?

To summarise the complexities at play in Beth's learning experiences, Beth had clear ideas about what she was "good at" and what she struggled with during primary school and these ideas started to cement themselves with secondary school setting early in her Key Stage 3 experience. She had also experienced high quality support for mathematics in primary school that allowed her to experience an early metacognitive strategy. This fed through into her secondary school journey so that teachers and assessment models that explicitly used metacognitive strategies meant that Beth was able to move away from anxious fixed entity thinking and believe that the strategies would lead to academic growth. She was influenced by a strong family narrative that placed high value on academic achievement expressed in grades which amplified her performance goals, but this was accompanied by

high levels of autonomy support from her mother who constantly talked about good enough effort and suggested proactive strategies around seeking help.

4.3.5 The one-shot interventions around mindsets create marginal impacts that are difficult to sustain: what CAN schools do to improve the learning experience and outcomes for children?

Beth's case highlights: the importance of understanding leaners' self-concepts at transition: the potential of setting and high stakes testing to undermine the confidence of fixed entity learners; the efficacy of low-stakes testing and of assessment models that allow students to understand their progress in a profound, subject specific way; the value to students of teaching that makes metacognitive processes explicit; and finally, the role of family narratives and autonomy support in the development of learner confidence and efficacy beliefs.

Figure 4.2 is an illustrative summary of the dynamics at work in Beth's case
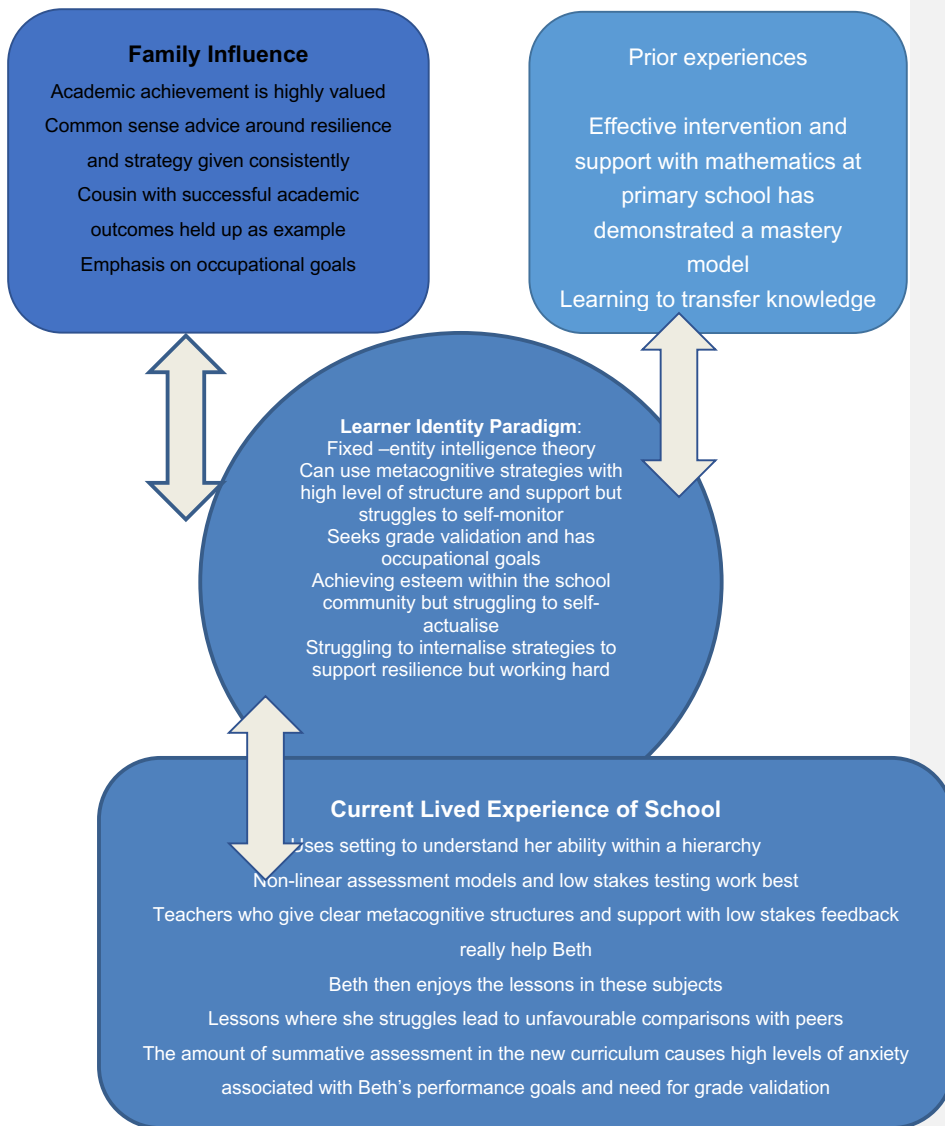
Family Influence

Academic achievement is highly valued

Common sense advice around resilience

and strategy given consistently

Cousin with successful academic

outcomes held up as example

Emphasis on occupational goals

Prior experiences

Effective intervention and
support with mathematics at
primary school has
demonstrated a mastery
model

Learning to transfer knowledge

Learner Identity Paradigm:
Fixed –entity intelligence theory
Can use metacognitive strategies with
high level of structure and support but
struggles to self-monitor
Seeks grade validation and has
occupational goals
Achieving esteem within the school
community but struggling to self-
actualise
Struggling to internalise strategies to
support resilience but working hard

Current Lived Experience of School

Uses setting to understand her ability within a hierarchy

Non-linear assessment models and low stakes testing work best

Teachers who give clear metacognitive structures and support with low stakes feedback

really help Beth

Beth then enjoys the lessons in these subjects

Lessons where she struggles lead to unfavourable comparisons with peers

The amount of summative assessment in the new curriculum causes high levels of anxiety

associated with Beth's performance goals and need for grade validation

Fig. 4.2 Illustration of the dynamics in Beth's case

169

4.4 Ellie: "Her Mum's the same"

4.4.1 To what extent are mindsets binary? Are children simply growth or fixed-entity, or do mindsets vary across different activities?

Ellie's Intelligence Theory of 4.0 suggested that she had a Growth Mindset and when I spoke to her in year 9 about her learning and the curriculum, she was quick to identify herself in this way:

> Because of subjects like geography or something like that which I've
> worked harder at and now I feel more confident, and I know more so I
> kind of feel like the more work you put in the better you become at
> something and then altogether you become more intelligent. (yr9 CI)

She made some observations during her interview that underline this notion of growth through effort. She had not identified any subjects that she made no effort in, "I just think that there's no point giving up because the harder you work the better you become and then all together that just helps you out" (yr9 CI). The second time she refers to the growth mindset she is actually quoting her mother's advice about revision: "Which is to try your hardest and then you can't ask for more" (yr9 CI). Finally, she describes overcoming a setback in mathematics in true growth mindset style. She was struggling to remember mathematics from earlier in the year and found that working hard at recapping helped her to overcome this. "When you recap things it all starts coming back and if you don't understand it you just tell your teacher that you don't, and my maths teacher helps me a lot" (yr 9 CI). She explained that she was comfortable asking for help: "I just feel that you're not going to get anywhere if

you don't as." (yr 9 CI). Interestingly, she talked about working collaboratively with peers in order to improve understanding. Again, displaying a growth mindset attitude. She asks people who "can just click away" in computing for help. Similarly, in personal development, "there's children that know more than others, so you have to pick up from them and then you go on learning as like one so that equals things out" and in mathematics, "You kind of all just help one another out" (all yr 9 CI).

Whereas Ellie was happy to reciprocate with peers in this way, she did say several times that there were children who are "just naturally good" at subjects that she struggled with whilst stating that she found "art and stuff like that quite naturally easy". I found the difference between attributing achievement in others to natural talent whilst accounting for her own successes by describing subjects as "easy" interesting in that it speaks more of a fixed entity mindset. It is quite possible that her answers to the Growth Mindset questionnaire were representative of what she thought she should say rather than what she really thinks.

She described peers who were good at RPE as "the people that will be getting really high grades because they just naturally pick stuff up at school like they're good at learning sort of thing" (yr 9 CI). She was conscious of a difference between herself and these children: "I don't really know how they do it - they just pick up a lot more" (yr 9 CI). She cited the example of a friend who could give a detailed answer about geography, "because she's just really good at picking things up and they stick in her brain a lot more" (yr 9 CI).

171

Ellie's passion was mainly for the outdoors, but she also loved to be creative. Her favourite aspect of English was creative writing, "I used to love doing that. I used to write stories and everything at home" (yr 9 CI). She was very proud when her poem was published. Sadly, these seem to be memories of time before secondary school. She loved making things too: "I just kind of put my imagination to it and go with whatever is the final product" and enjoyed design technology,

"I also like the fact that we make things a lot like woodwork and stuff" (yr 9 CI).

Ellie had a complex and contradictory profile of implicit theories. She clearly believed in the efficacy of hard work and had internalised the notion that you can improve in a subject through effort. However, she also saw that learning came more easily to some of her peers than it did to her and expressed ideas of innateness to explain the contrast. She was more confident with practical and creative aspects of the curriculum, especially when she was younger, but during Key Stage 3 she was willing to use growth strategies when she faced setbacks, for example asking for help or collaborating with peers.

Ellie talked briefly about getting "really stressed" around examinations. Her explanation, "because I like doing really good" suggested, however, that doing badly in an examination was not catastrophic for her. She "wasn't happy" when she did badly in her mathematics and found it "really annoying" rather than distressing (all yr 9 CI). So, what was at the heart of Ellie's learner "self"? A commitment to effort whatever her starting point, a basic understanding of

learning as understanding and remembering, a sense that some understanding comes naturally to her, while understanding in some subjects does not and a powerful family narrative that defined her in significant ways as literary, sporty and interested in history and her brother as mathematical because he is naturally talented. Even with this slightly conflicted set of self-concepts we would hope that Ellie would continue to work hard, enjoy her creative and outdoor subjects and achieve at least her median grades as she got ready to leave school.

4.4.2 Do Implicit Theories of Intelligence have an impact on school outcomes such as grades or destinations?

Ellie's average CAT score of 103 suggested that she was of average ability. This was also suggested by her baseline assessments in year 7, which were all at National Curriculum level 4. Her secondary school would expect her to be capable of GCSE grades of mainly Cs and Bs (or the new grades 4-6) and in year 9 her teachers said that she was on track to achieve that, not least because her average effort grade was over the 3.82 that denotes likelihood of upper quartile achievement at 16. The DfE transition matrices suggest that for most subjects her median was a 5+ and her upper quartile a 6. In year 9 Ellie's growth mindset score seemed to be evidenced by her high levels of effort and commensurate progress.

By year 11 it was clear that Ellie's studies had not gone as well as had been hoped in year 9. According to her teachers' last set of predicted grades she

was likely to be at least 14 grades adrift of an upper quartile performance and 7 grades adrift of a median expectation. Her effort grades indicated that something had changed in her approach to studies as, rather than represent an average effort each half term of the 3.82 that correlates with upper quartile outcomes, they showed a steady decline over the two key stage 4 years from 3.75 to 3.17. Worryingly for Ellie, neither her mathematics nor her English teacher was predicting a standard pass (grade 4) at GCSE. If she did end up with the grade 3s they were suggesting she would need to re-sit both these core subjects next year and was unlikely to be offered a level 3 course at post-16.

Ellie's actual GCSE results were disappointing. She was eventually 16 grades adrift of her DfE median grades, did not manage a standard pass in English and mathematics and was unable to progress to the sixth form. She enrolled on a course at the local Further Education college but withdrew from that after a term.

What had happened to take an enthusiastic, hardworking student with considerable promise to the point where she under achieved to the extent that it limited her choices and ability to make progress when she left school?

4.4.3 What are the processes that lead from Implicit Theories of Intelligence to academic outcomes?

Ellie was clear about how she could improve in geography. She liked geography because of its connection with the outdoors she loved, but she also talked about the supportive formative assessment regime in geography which allowed her to understand the learning process: "You do things like ability to describe and explain" and "they have like sheets which they put out on the table and they have like help of what to do so that if you do get stuck you can go to them" (yr 9 CI).

She also mentioned how helpful the mathematics version of this cognitive support was: "When you go back over your book because now, we have a different book for notes and one for work it just all sort of comes back" (yr 9 CI).

She used the expressions "sticking" and "picking things up" to describe the dual process of remembering and understanding quite regularly throughout the interview. Picking up seems to describe the process of understanding and laying down an early memory:

- "Sometimes I just struggle picking things up "(music)
- "It's harder to pick things up when there's no right answer" (RE)
- "I've always found Spanish easier to pick up."
- "If I don't pick something up I'll read over it at home or something and then it's more confident on in it." (all yr 9 CI)

Sticking was the process of retention and recall:

- "they stick in her brain"

- "It kind of sticks better"

- "It's just kind of stuck a bit better"

- "Sometimes things don't stick as well"

- "Only about 3 of them stuck" (equations!)

- "it's kind of stuck" (this one is different – she's referring to the family's
  sportiness) (all yr 9 CI)

These two processes of understanding and building long-term memories that
form schemata are crucial to making progress in learning and Ellie's
definitions of "picking things up" and "making them stick" were insightful.
Unfortunately, though, Ellie attributed efficiency in those processes to natural
ability: some people were just good at understanding and recall and she found
that she was not so good when she compared herself to them. She fared
better in subjects that had overt metacognitive scaffolding for learning like
geography and mathematics but for Ellie most of the curriculum presented
huge challenges around understanding and remembering that she felt were
down to her lack of ability.

Memory was an important aspect of learning for Ellie. The school were doing
a lot of work with pupils to encourage them to understand the importance of
remembering not just for the new, more content heavy linear examinations
these children would need to face, but also for the development of deeper
understanding (remembering for learning). Ellie talked about the link between
memory and understanding in several subjects. It is what she meant by
"picking up" and "sticking". She compared herself to her friend, "because

she's really good at picking things up and they stick in her brain a lot more."
(yr9 CI). Recapping in French and mathematics had helped her to understand
the complexities in the subject more: "Last year in mathematics… I forgot it if
it's not straight there in my mind", and in French "at the start of the year we
went over things a lot more, so we spent a couple of lessons at the start of the
year recapping everything so then it was with us to go on and learn more new
things" (yr 9 CI).

Science challenges came from "remembering key terms like frequent and
stuff" or "certain things like equations and stuff". In RPE she wrote terminology
in a glossary "so when it comes to revising you've got this big page full of
words that you need to know" (yr 9 CI). She tried to use memory to help with
the difficult skill of arguing from different viewpoints in RPE, a subject she
says she finds challenging, "because it's harder to pick things up when there's
no right answer, you've got to learn multiple ones" (yr 9 CI). I wondered if she
compared herself with pupils whose experiences have given them greater
cultural and social capital and rationalised that they know more about different
philosophical arguments because they have learned more content?

For Ellie therefore, the key processes that she had identified would lead to
academic growth were understanding and remembering. When topics were
revisited within a structured scheme of work, she knew it was helping her. She
was aware that some feedback within subject assessment schemes was
supportive for her as it scaffolded her understanding of her own progress.

She was also aware that other children had prior knowledge, particularly around cultural and linguistic sophistication to which she did not have the same recourse.

4.4.4 To what extent are there more complexities involved in the translation of Implicit Theories of Intelligence into outcomes? e.g., the social and reciprocal nature of education, or the role of communities, families, and parents?

Ellie's family were influential both in terms of attribution narratives and in terms of their support for her learning. Ellie talked about a family narrative that attributed different abilities to her and her brother along what could be gender stereotypes: "It's always been Sam good at maths and me good at English" but then she also echoed something that she had already hinted at, that she would talk about others' achievements as natural talent, whilst hers were attributable to experience or practice, rather than an innate gift: "It's always been Sam good at maths because Sam never liked reading … Sam's never liked reading and he's just more naturally talented in maths" (yr 9 CI). I wondered if this family story comes from Sam's reluctance to read more than his natural mathematics ability. Ellie's retelling of this family narrative was contradictory. She attributed her own understanding in English to doing more and her brother's status as a mathematician to not liking reading and being naturally talented. There was a lack of clarity about the correlation between practice and progress in learning within the family narrative. The gendered nature of this difference for Ellie and her brother cannot go unnoticed either.

178

Ellie was better than Sam at English because she read more whilst Sam was better at mathematics because he was naturally talented.

Ellie's family narrative contributed significantly to her learner "self". She hinted at that when she talked about realising she preferred the outdoors when, "We were out the other day, making a den in my dad's yard". She was interested in history, "with Dad always watching, "Time Team" and she loved her sport as, "I'm from a very sporty family" (yr 9 CI). There was a contrast between this family narrative around the outdoors and physical activity and the more confusing picture that emerged when the family engaged in talk around learning, at least according to Ellie at this early stage of the study. Were the seeds of Ellie's declining progress already sown?

Both Ellie's parents attended her year 9 academic review which took place shortly after her examination results were out. The reviews allowed for three-way discussions about preparation for the examinations with pupil, parents and reviewer contributing to the debrief. An analysis of the transcript of the review revealed mixed messages, particularly from mum, about how hard Ellie has worked: "She does work hard. We also had a discussion that we didn't think she worked quite as hard as she normally does for exams and "she did work hard, but there were a couple of subjects we knew you could have worked harder on couldn't we?" (yr 9 AR). Mum and Dad discussed Ellie's phone use which they felt might be problematic. Then Mum suggested that there are priority subjects but at the same time she seemed to say that when Ellie feels the subject is an important one, for example mathematics, then

179

Ellie's state of mind affects her ability to do well: "I think the subjects that she feels are important, sometimes when it comes to revising can be a bit over-powering, because she wants to do so well, and the subjects that maybe are not as important, we just breeze through the revision" (yr 9 AR).

Whilst there is a logic to stating that high stakes examinations lead to increased anxiety, the parents did not acknowledge any need to address this anxiety and seemed to accept that this is how Ellie is. It could be that, while they were supportive of Ellie's learning in theory, they were struggling to understand how to help Ellie to engage with the process. Mum asked in both academic reviews in the course of a year about Ellie having a test to see if she is a Visual, Auditory or Kinaesthetic (VAK) learner: "There is a test you can do to find out what sort of a learner that you are. Is there any chance that Ellie could have that test?" (yr 9 AR). And again, in year 10: "With Sam he did an exercise test that showed what sort of a learner he was. Have you done that?" (yr 10 AR). The VAK approach is a debunked theory and the reviewer tried to explain this on each occasion advising that Ellie try out as many of the suggested revision techniques as she can in order to find out what works well for her. Mum admitted in year 10 that she did direct Ellie to them before the examinations, but Ellie rejected them: "it's too close to my exams to start" (yr 10 AR).

This resistance to effort was apparent in Ellie's year 10 academic review but it started in her year 9 one. When the reviewer asked her if she could work harder, she gave a minimal response, "Yes, maybe." When the reviewer

180

asked what she could do to master learning key words for chemistry she was similarly non-committal: "probably revise them at home, after the lesson" (yr 9 AR). By year 10 her effort grades were dipping below the 3.82 that indicates effective effort levels, but Ellie had already "explained" this to her parents by saying, "that the reason her effort grades are lower is because the subject matter is a lot harder because of the new exams that are coming through" (yr 10 AR). Ellie may well have believed this to be the case. She had managed to persuade her mum that it was. The reviewer countered this belief by explaining that harder content should not lead to a discernible drop in effort and that this is not the norm. Dad accepted this straight away: "So that is no excuse. I understand." The reviewer continued, asking Ellie why her effort grades had dropped for sciences. Ellie explained that "in physics all year, I've been sat next to people that have distracted me, but he has always told me that I've been the one to put my head down." Not only did she seek to externalise the reason for reduced effort she claimed to have good study habits: "Usually well I have a book at home which I do all my - you teach it without something in front of you then it knows that you've got it good" (yr 10 AR). So, Ellie had sufficient understanding of the metacognitive strategies involved in learning: did she have the self-regulation needed to sustain these strategies? The reviewer asked how often she carried out this type of effective reviewing: "I don't know, it's like I will go for a week where I'll do it a lot and the next week, I won't do it as much." When the reviewer suggested she tried to go from using these strategies 50% of the time to 80% of the time Dad commented, "I think you have hit it on the button there. Fairly well" (yr 10 AR).

181

At this point, however, Ellie started to get upset and cried. She protested, "There is something about exams that I can't do them, but I put in all the work." Dad took his cue from the comment about examination anxiety without continuing the challenge around working hard enough. "She gets wound up about the exams…her mum was the same." Mum then followed this with a frustration about the national assessment reforms: "I just think that too much was taken away from the coursework. I was the same with exams" (yr 10 AR). So, parents and reviewer were now talking about examination stress rather than the fact that Ellie was simply not putting in the time and effort required. The review ended with the reviewer exhorting Ellie to get her effort grade average over 3.82 by showing her teachers that she is engaging with her learning and remembering more. She agreed to this growth goal in the review meeting, but sadly, the next year's grades showed a steady decline in effort and progress.

Parents declined to meet with the reviewer in year 11 and Ellie's path did not alter.

4.4.5 The one-shot interventions around mindsets create marginal impacts that are difficult to sustain: what CAN schools do to improve the learning experience and outcomes for children?

Ellie should have done better in her learning, achieving higher grades than she did, having plenty of choice at post-16 and most importantly having the ability to apply herself to learning in the future. She was doing well at Key Stage 3 but the more difficult content of her Key Stage 4 courses and the

need for higher levels of effort seemed to confound her to the point where she was becoming distressed in her review. Her parents were at a loss to know how to support her, focussing on her emotional wellbeing and supporting her to reduce her effort around learning. Her mother did want to try and understand how Ellie learned but without a clear understanding of how learning took place beyond an idea about needing to work hard before examinations she could not advise her daughter or help her to reach any kind of autonomy.

Would a clear description of learning have helped Ellie's parents to help her? Their influence on Ellie was certainly powerful and school's usual processes were unable to divert the course Ellie and her parents were on together. Would these caring parents have been able to help their daughter to understand what she needed to do had they been given the tools they needed? Figure 4.3 illustrates the relationship between Ellie's family influences, prior experiences and lived experiences of secondary school and the impact of these influences in her learner identity.
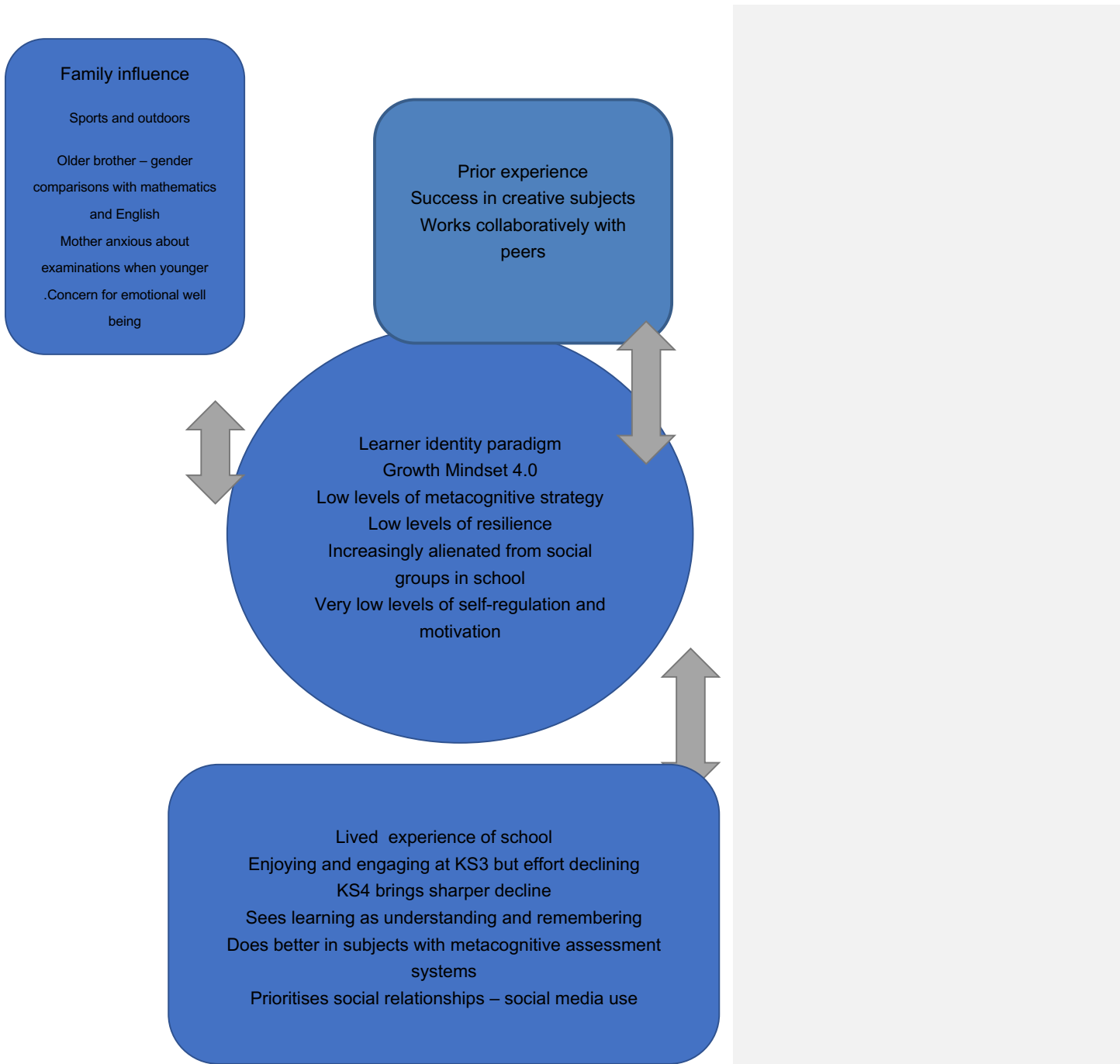
> **Commented [PD10]:** Check whether all instances of 'examinations' being inserted also inserts an extra space, and omit as necessary.

Family influence

Sports and outdoors

Older brother – gender comparisons with mathematics and English

Mother anxious about examinations when younger

.Concern for emotional well being

Prior experience
Success in creative subjects
Works collaboratively with peers

Learner identity paradigm
Growth Mindset 4.0
Low levels of metacognitive strategy
Low levels of resilience
Increasingly alienated from social groups in school
Very low levels of self-regulation and motivation

Lived experience of school
Enjoying and engaging at KS3 but effort declining
KS4 brings sharper decline
Sees learning as understanding and remembering
Does better in subjects with metacognitive assessment systems
Prioritises social relationships – social media use

Fig. 4.3 Illustration of the dynamics in Ellie's case

4.5 Lennie: I've been in work since I was twelve.

4..5.1 To what extent are mindsets binary? Are children simply growth or fixed-entity, or do mindsets vary across different activities?

Lennie scored 2.33 on his Intelligence Theory questionnaire stating that he agreed you have a certain amount of intelligence and you really cannot do much to change it and that whilst you can learn new things you cannot really change your basic intelligence.

4.5.2 Do Implicit Theories of Intelligence have an impact on school outcomes such as grades or destinations?

Lennie was an articulate and mature young man who had had to cope with some learning difficulties and with family issues that had impacted on his welfare. He was a Pupil Premium student, classed as disadvantaged because his family was in receipt of Free School Meals. This meant that school received additional funding to try to close the attainment gap between him and his peers. The school had provided a range of additional types of support for Lennie since he joined in year 7. He was originally in the Transition Group which saw a small group of year 7 students taught a range of subjects through projects by two teachers. Lennie actually spoke to the Governors' Curriculum Committee about how he had been helped to settle into school through working in the Transition Group. His progress scores in year 7 certainly supported that the provision had been helpful for him.

Lennie was also given targeted support for his weak literacy at Key Stage 3. He took part in the Word Shark spelling programme and the IDL Dyslexia Intervention programme (an online tutorial-based approach). He also received additional literacy and numeracy lessons led by Learning Support staff in years 8 and 9. As he progressed to his Key Stage 4, the additional mathematics and English stayed on his timetable and he was given additional support by a tutor who specialises in supporting Pupil Premium students. Concerned about his welfare as his family circumstances worsened in year 10, the school also asked its Pastoral Support Co-ordinator to work with Lennie to make sure that his welfare needs were being met and that there was someone in school he could talk to about his wider difficulties. In an analysis of the impact of Pupil Premium spending on this cohort the school could report that its additional provision for Lennie had helped him to keep pace with his peers and it could well be that without these interventions Lennie might not be in this position at the end of his secondary schooling. However, interviews with Lennie revealed that there was possibly much more going on with Lennie's learning and that there are some significant factors in his progress that a Pupil Premium report would never reveal.

Lennie was also on the school's SEN register for a Specific Learning Difficulty (SpLD). The Learning Support department drew up a Support Plan for Lennie recommending their intervention programmes plus classroom accommodations including encouraging him to record learning and set tasks fully in his books, helping him to focus in lessons, directing him to learning support homework club and seating him appropriately. They did not feel that

his difficulties were severe enough to warrant any additional examination access arrangements and felt that Lennie should make good progress with his literacy in Key Stage 3 like most pupils who present like him at transition.

As he approached his GCSEs his predicted grades indicated that in spite of his difficulties, Lennie was on track to attain his medians in all his subjects and even his target grades in others, most notably English. He eventually achieved between his DfE median and target grades with 2s in mathematics, science and business studies, 3s in English and a second science and his highest grades in practical subjects: 4 for art and an impressive A grade in a level 2 technical project. He was able to access his chosen destination, the Army Foundation College.

4.5.3 What are the processes that lead from Implicit Theories of Intelligence to school outcomes?

Lennie compared his two mathematics teachers:

> I prefer my maths with the teacher I have once a week, than the one I have through the week, because he actually explains what we are doing, and if we get an answer wrong, he will go through it with us and that is the one I am making the most progress with. But with the other one they just say if we get it wrong you tick wrong and then we move on. She doesn't explain how to get to the actual answer. (yr 10 AR)

Mathematics was a challenging subject for Lennie. When I met with him after his year 10 examinations he was despondent about his performance in his

187

mathematics: "I thought I was doing really well with it, afterwards, I thought well that went really well. I got my test paper back and thought something has gone wrong here." When I asked him if he knew why so many of his answers were wrong he expressed his frustration at his teacher who he said, "Didn't really help us with it. She handed out the exam, let us look at it, and then she took then back." He felt angry with his teacher because he thought she was "teaching us like babies". He felt that the focus on learning the times tables was "like she's trying to teach some nursery children" and that "It's all a bit childish". However, by his own admission, his times tables knowledge needed work: "I can do my 9s timetable, my 8s I'm a bit iffy on" (yr 10 AR).

He did not seem to acknowledge that his difficulties with mathematics could be because he needed to consolidate some basics and this particular teacher had not seemed to communicate that to him. He was more prepared to take advice from another mathematics teacher who offers to help him, "She has got me to work on my fractions in the revision booklets. I've started doing that." He appreciated that she had "marked the page" and he was actually going through the revision tasks independently at home (yr 10 AR). It was interesting to note that even though Lennie was so incensed at his mathematics teacher's apparent infantilising of him, he was still prepared to use his own agency to seek help elsewhere and to practise in his precious time out of school, "only a little bit before bed because I have not got a lot of time" (yr 10 AR) .

He was mature enough to take responsibility for his progress at school, explaining that he wanted to move seat in physics, "because at the moment in Lab 1 I sit behind the bookcases. So, you are on a level with the boar." (yr 10 AR). However, he was less able to practise self-efficacy in biology where long-term serious illness meant his teacher was off work and unlikely to return. "there is like a different teacher every term. Everyone has different teaching methods" (yr 10 AR).

Fortunately, Lennie was doing well in English with an impressive mock examination grade of 5. He liked his teacher: "He finds a level to connect with every single student" (yr 10 AR). Lennie was mature enough to know that he needed to do well to access economic well-being in the future. He had his goals and knew what he needed to fulfil them. Working in mathematics and English was a response to an extrinsic, strategic motivation to progress to the Army Foundation College at Harrogate. He brought in the practice mathematics test papers they had sent him so that he could get help from the mathematics teachers he had chosen. The papers were challenging, but he persevered.

However, during his interviews Lennie talked about how difficult he found reading and writing. In year 9 he told me that he liked learning new words - and he was articulate and mature in his spoken English - but that handwriting, and spelling were a problem, and he was much better working on a word processor. He also told me that he struggled with working memory and needed step by step instructions. He thought he had a poor memory and

189

forgot what he had learnt in some of his subjects from one week to the next because he did not practise in between lessons. When pressed on the reason for this he explained that he was not motivated with subjects like mathematics and computing, and he had "other things to do". He said he could do mental mathematics because, "I can do it in my head better" (yr 9 CI) and that language problems affected chemistry and biology but not physics where the language was somehow more accessible for him, perhaps because the concepts in the subject were ones he was familiar with outside school. He also told me that he enjoyed expressing his own opinions and was happiest when he was able to write or talk about something he knew about or cared about but less comfortable when he had to imagine an opposing argument for example in a debate about abortion in RPE.

He talked about having support for his writing in primary school. He was given handwriting support but still struggled to form letters and to write longer words. He missed the scribe he was given for examinations in primary school too:

> I can't really write that well. In primary school we have exams. Exams in most schools are a lot different because I had a scribe, and it was a lot different and then coming into this school and having to do my exams writing even more writing in class it was a lot harder. Writing for me is just something I can't get the hang of. (yr 9 CI)

This had affected his progress in geography in year 9 but in history, which makes high literacy demands on learners, he was making outstanding progress:

Well a lot of it, recently what I've been doing is typing on the computer. Also with the writing that we've been doing, it's never been like a giant piece of writing that we have to do. It's only broken down into sections which really helps instead of just doing a continuous essay. (yr9 CI)

He attributed doing well in English to the right topic on the paper:

"The exam we have had this year was actually about something I can write about. It was about living in the countryside and being able to have jobs" (yr 9 CI). He did less well in an earlier paper though: "the exam we had before that was about conflict… and I am not that familiar with writing stuff like that" (yr 9 CI). Lennie was very clear about needing to stay on familiar territory: "Ever since year 7 and definitely at primary school I have always written what I wanted to write. Something I know about. That what I've always done" (yr 9 CI). He chose his GCSE options carefully, opting for art because, "you can make what you want. There is not a lot of writing" and rejecting computing. "It's just all the big words, having to get my head around phrases and everything you have to do that goes with it" (yr 9 CI).

Lennie had a fixed-entity intelligence theory, he believed that he was not going to get any cleverer through his efforts. Whilst he was motivated by his idea about Army Foundation College and was resilient enough to overcome frustrations with school and keep going, he had little metacognitive awareness. He didn't know why he had done badly in mathematics and could not make the connection between his lack of progress and the need to consolidate the basics like times tables. He had learned the usefulness of highlighting texts in examinations: "I found it easier to highlight the important

191

bits because a lot of it in it just wasn't relevant to it at all" (yr 10 AR). But this was a rare moment in the interview data. Most of the time he seemed reluctant to move out of his comfort zone and resisted aspects of the curriculum that he felt less confident about. In his art he had, "kind of persuaded them to let me do some photography" and as early as year 9 said, "In the subjects that I'm really passionate about you will be able to see that I work a lot harder in them" (yr 9 CI). And he described his personal qualities as independent and careful:

> I've always been quite independent with everything, with what I've done. I am very careful in what I do, what I make and that will reflect well, when I do projects and stuff like that. (yr 9 CI)

Lennie also saw school as a means to an end and not the "real world" where adults treated him as an equal and where he functioned more maturely and independently than his peers. He derived any sense of belonging in school from teachers who knew him and acknowledged his ability to take responsibility.   He was an extraordinary young man in many ways with an unusual skill set that, combined with his modest achievements in school should allow him to have a future in the workplace. Somehow, the patchwork of support and good teaching had mitigated his disadvantages and the teaching that had not worked for him. Lennie's own strength of character and determination had done as much to make sure he has made progress as any Pupil Premium spending. "I thought that if I go to an apprenticeship, work in the real world, pay for my own stuff I will get practice for when I am ready."

4.5.4 To what extent are there more complexities involved in the translation of Implicit Theories of Intelligence into outcomes? e.g. the social and reciprocal nature of education, or the role of communities, families, and parents?

Lennie was unlike any of the other students in the case study cohort in that his mother was unable to come into school for any of his academic reviews. Fiercely protective of his family and appreciative of the support his mother and siblings were receiving from the extended family, Lennie was always private and never comfortable sharing information about his circumstances. Lennie did share in year 10 that he was shouldering considerable responsibility for his younger sister whom he took into the primary school across the road every day which sometimes made him late. He expressed his frustration with the other parents at the primary school, "Them parents in the playground, they are around like blooming vultures" and his gratitude to one of his teachers who was dropping her own child off at the school: "Miss got me out though, she said he is late for school, so he has to go."

He was prepared to tell me about his own paid employment, in fact this had been an important topic for Lennie whenever we talked. He said he had "been in work since I was twelve." In year 9 he proudly told me, "In the summer holidays I'll actually be working with a gamekeeper" …" I am doing a lot of stuff like that, and do more farm work, in the workshop at the farm because we have got a brand-new workshop, it's got everything in it and my Uncle just lets me get on, do what I want." Not content with a summer holiday job:

> I am working on getting a job at the Bakery at the moment. I know the
> manager and he says he will be able to get me a job once things clear
> out a bit more. I have worked in workplaces around (the town) often.
> The hours aren't bad. (yr 9 AR)

By year 10 he was very busy out of school. He explained that he'd talked to
his boss about the forthcoming examination season and the need to reduce
his hours. I asked him how many school nights he was working: "Three last
week and I've only got two this week" …"I've already quit two of my jobs
because it was just too much" … "I was working at the Bakery and that new
Tapas place, No.9". He went on to say, "No.9 is the best place I have ever
worked. It was amazing, the people were amazing. It was only working on a
Saturday night, but I wasn't bringing a lot of money in. So, I said I'm sorry,
then I went to Plato's instead" (yr 10 AR).

When Lennie talked about paid work, he demonstrated considerable maturity.
He had the confidence to negotiate his work with adult employers, to give up a
job he loved for one that paid more and to try out different places of
employment, at one stage juggling three part time jobs. He also talked in his
interviews about his learning through these part time jobs. When I asked him
about important workplace skills, he was quick to tell me:

> Being able to communicate with the older people, which I've spent my
> life around older people and been around that a lot, so I've really got
> that. Also just communicating, being able to talk to then without
> sounding like you're the boss and being smarter than them just
> because you're younger. (yr 9 AR)

He identified getting organised for a shift at work as a key target when he reviewed his organisation skills: "Putting my workplace into order because ten minutes before work I will be rushing around trying to find my tie or something."   Getting organised for school is not an issue for him, "because it's all just put in one place" … "School is more of putting my books in my bag, so I don't have to worry about that" (yr 10 AR).

Lennie needed to earn money. He gave up a job he loved because it didn't pay well enough. He had had to engage with paid work early in his secondary school years, but this meant that he had developed employability skills like communication, organisation and discipline and related well to adults. School was not "the real world" to him. Working in an adult environment was. This adult environment included his extended family who supported him and his siblings:

> My Uncle Dan actually owns his own carpentry, and he makes all types
> of things from beds to wardrobes and he sells them. My other uncle he
> does welding, he's done things all around the world. He travels a lot.
> He gets his stuff put on TV. He makes sculpture and stuff and being
> around all these people makes me think that I wat to do the same
> thing. (yr 9 AR)

He told me about a particular incident where the school and working worlds collided. It concerned a conversation about his struggles with mathematics: "When I was at work, I was talking to a teacher that was at the bar and I was talking to him about how badly I did in it. I was just saying where I wanted to go on to in the future to college" (yr 10 AR). Most students encountering their

teachers outside school maintain the same social imbalance in their interactions. Lennie had none of this sense when he was talking to a teacher at the bar where he works. Teachers were adults in the workplace, and he understood the workplace better than any of his peers. When his focus group seemed to suggest that an ideal teacher is "one who has no rules" who lets his students say what they want, is "casually late" and "Just watches movies because work's kind of boring" Lennie was quick to remark:

"We're trying to describe the perfect teacher no one that wants to get fired" (yr 9 FG). Did Lennie's sense of his own maturity and his experience of adults affect his attitude to school?

Lennie was clear about what he needed from his teachers. When asked to describe the best kind of teacher he responded:

> a teacher that gets involved instead of just writing on the computer doing notes - actually going round the class helping you. A teacher that knows you don't like everything, so you find some common ground with them, so they don't think you like everything and know everything about a subject and a teacher that helps you.

He added: "a teacher that doesn't shout if you get it wrong. That goes through it instead of just shouting it all out and saying that they expected you to get it." He repeated the importance of one-to-one help in the classroom when he described a good teacher as someone who will "Get involved with the student".

Throughout his secondary schooling Lennie had to look after himself - and at times his younger sibling - whilst having to negotiate his way through the complexities of his learning without parental support. Fiercely independent and strong-willed he knew what he was familiar with and liked, had little time for teachers who patronised him or who did not take the time to get to know him and finely calibrated effort with his studies with his paid work and responsibilities outside school. He admitted to having little time for schoolwork once he got home, telling me that he revised a little for his mocks, "but not as much as I could have done" (yr 10 AR). Whereas those students whose parents attend academic reviews are helped by the conversation with adults from home and school to take an overview of themselves as learners, Lennie had to try to glean what he could from the short time with the reviewer and there was no one to continue the conversation or remind him of the key issues at home.

Lennie's family troubles meant that he had little if any support for his. Most children with these difficulties struggle to engage with learning and often display unmet need in challenging behaviour in school. Lennie did not do that, instead he developed maturity and a sense of agency through paid work and with the support of his extended family. He was extrinsically motivated, using his strategic goal of entering the Army Foundation College to help him to make effortful responses to the learning he undoubtedly found difficult because of his SEN. This agency gave him the confidence to select and approach the teachers he had identified as able to help him and whom he could trust.

4.5.5 The one-shot interventions around mindsets create marginal impacts that are difficult to sustain: what CAN schools do to improve the learning experience and outcomes for children?

Lennie's story shows us an alternative to the narrative of disadvantaged learners. Without parental support for his learning he struggled to arrive at any metacognitive strategies that would help him but his ability to secure paid work within a rural community that supported him, and his family meant that he was able to develop a sense of agency, autonomy and ambition that drove him to be successful and have clear goals to work towards. There were enough teachers in school whom he trusted to help him, and he accessed their support to create his own set of modest growth goals: they were enough to bring him the moderate success he needed. His curriculum allowed him to do very well in the practical subjects he and his community value. Lennie needed this network of support in and out of school at the same time that he needed to feel autonomous within it. His is a story that highlights the importance of school as social space full of reciprocal relationships and connected to its local community.

Figure 4.4 illustrates the dynamic relationship between Lennie's family and prior experiences, his experience of secondary school and his learning identity.
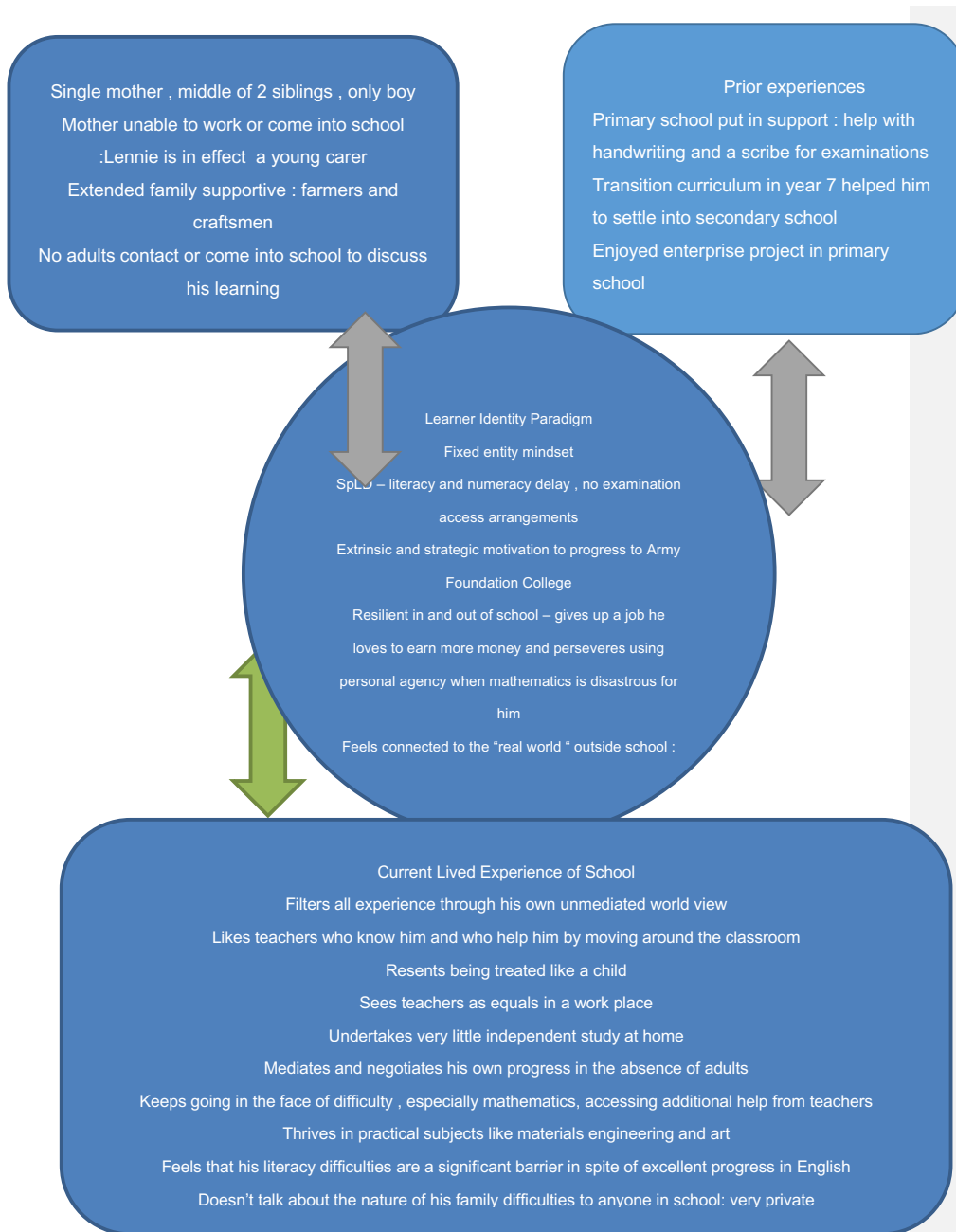
Single mother , middle of 2 siblings , only boy
Mother unable to work or come into school
:Lennie is in effect a young carer
Extended family supportive : farmers and
craftsmen
No adults contact or come into school to discuss
his learning

Prior experiences
Primary school put in support : help with
handwriting and a scribe for examinations
Transition curriculum in year 7 helped him
to settle into secondary school
Enjoyed enterprise project in primary
school

Learner Identity Paradigm
Fixed entity mindset
SpLD – literacy and numeracy delay , no examination
access arrangements
Extrinsic and strategic motivation to progress to Army
Foundation College
Resilient in and out of school – gives up a job he
loves to earn more money and perseveres using
personal agency when mathematics is disastrous for
him
Feels connected to the "real world " outside school :

Current Lived Experience of School
Filters all experience through his own unmediated world view
Likes teachers who know him and who help him by moving around the classroom
Resents being treated like a child
Sees teachers as equals in a work place
Undertakes very little independent study at home
Mediates and negotiates his own progress in the absence of adults
Keeps going in the face of difficulty , especially mathematics, accessing additional help from teachers
Thrives in practical subjects like materials engineering and art
Feels that his literacy difficulties are a significant barrier in spite of excellent progress in English
Doesn't talk about the nature of his family difficulties to anyone in school: very private

Fig. 4.4 Illustration of the dynamics in Lennie's case

4.6 Oscar-"I should but I don't."

4.6.1To what extent are mindsets binary? Are children simply growth or fixed-entity, or do mindsets vary across different activities?

Oscar's Mindset score was 3.66 suggesting that he was "borderline" in terms of his Intelligence Theory. This was borne out in his year 9 interview when he said:

> I'd say that you are born with a certain amount of intelligence which puts you up there and helps you learn stuff but with the right amount of effort that you put in you just have to put more in to become cleverer.

He elaborated on this borderline position, however, by suggesting that effort is required from those who are not born with natural ability:

> the people with fixed entity probably find it a lot easier so that in the sweeping generalisation will be cleverer than the people that find it hard to learn but eventually if they spend hours and hours revising and such then they will get up there. They'll get on and achieve. (yr9 CI)

He was aware of his own ability and excited by it. He knew it was an ability based on problem solving and the easy retention and recall of information. In PSHE, he liked "to think of logical answers to things …I don't really need to think about it for a long time that I've already got my opinion about that when I hear about it" (yr9 CI). He found science easy,

> because I can understand it. I just get it all and I can understand how things are connected and then when I'm going through a test paper, I'll

revise but then I just see something, and it'll just click, and I remember it. (yr9 CI)

He was confident in his ability to problem solve in subjects like mathematics and science and did not panic in tests when faced with a problem he couldn't solve straight away:

I always have it lurking in the back of my mind then finish the ones I know and then eventually it'll just come together why, or I'll find a different way of working back of how I got that answer and how it's wrong. (yr9 CI)

He was resilient about setbacks when problem solving:

"I think it's pretty natural to get stuck and if you don't get stuck then you're not really learning are you? You're finding it too easy" (yr 9 CI). In year 9 he seemed to be prepared to work hard for assessments: "I like to be tested and get things wrong and go back over it and write it out again and feel like I know what to do" (yr9 CI).

At this stage in Key Stage 3, Oscar was talking like a growth mindset learner. He appreciated the value of effort and was articulating metacognitive strategies that included planning, monitoring and evaluating the way he was learning. When he had his Academic Review though it revealed a mixed picture. I asked him to account for outstanding progress in his favourite subjects and he acknowledged that underperformance in other subjects was down to less effort: "Yes. I will try harder with the others" (yr 9 AR). Having to compromise between falling behind or producing a substandard artefact was a frustration in design technology, but he was not too concerned and laughed

when he described his lack of skill. When he talked about the discussion sessions in PD (personal development) he was pleased that he had, "already got my opinion "about topics under discussion. Was his emphasis on the quick answer, so prevalent in his descriptions of his learning, the dominant factor even in subjects designed to widen debate and produce complex thought processes that consider other viewpoints?

For a learner who seemed so independent it appeared contradictory that Oscar's favourite subject throughout the three years of the study was drama. He never wavered on this. In year 9 he had to insist on being allowed to take it in the face of his mother 's unease with what she saw as "easier" subjects: "as long as I can take drama, I'm pretty sure it will be okay" (yr 9 AR). By year 10 he was, "thinking about going to drama school because I really, really enjoy it" (yr 10 AR). Drama requires a social style of learning, however, he never explained why he enjoyed drama so much beyond saying "I can do that" as a way of explaining he didn't need to work at – along with problem solving.

Oscar felt confident and able to learn in Key Stage 3. He thought that effort was required if you were not already functioning at a high level but that he could feel his intelligence working effortlessly for him. He talked about being prepared to put effort into subjects he knew he could improve in but was not able to gain any traction with this. He dismissed technical subjects as not important, but he did express a determined passion for drama and art: creativity was important to him, in spite of some parental opposition.

4.6.2 Do Implicit Theories of Intelligence have an impact on school outcomes such as grades or destinations?

Oscar arrived at secondary school with high hopes. His Cognitive Ability Test scores indicated considerable academic ability and meant that the school identified him as YGT (Young Gifted and Talented), in line with the legacy policy of identifying high prior attainers in order to ensure they had enough stretch and challenge to make rapid progress.

His mock examination grades in year 10 were 16 grades adrift of his DfE median. At this stage in year 10 his teachers were reporting high levels of effort: his effort grades were averaging above the 3.82 that the school uses as an indicator of Upper Quartile performance. The same teachers were predicting GCSE outcomes that were 12 grades adrift of the median at the same time. Was it because in class Oscar's effortless retention and recall looked like high levels of application? Perhaps he was able to respond to the formative assessment activities in lessons and homeworks: the quizzes, the plenaries, the short tests and the in-class problem solving but when tested on extended examination questions Oscar was unable to demonstrate the skills level expected of the higher grades (e.g. synthesis, evaluation, extended academic writing).

By year 11, his early promise was not translating into high attainment: his predicted GCSE grades were 12 grades lower than his DfE median. This was concerning in a school that aims for its students to achieve nearer the DfE

Upper Quartile. This disappointing progress was explained by his effort

grades, which had declined from a healthy 4.12 average in year 10 to a

worrying 3.45 average in year 11. This was a dramatic drop and went against

a school trend for increased effort over the two GCSE years as children

matured and developed better study habits. Oscar's final GCSE grades

ranged from a 3 for art, 5 for history, 6s in chemistry and English, 7s in

mathematics, physics and biology and an 8 in his beloved drama. They are

good grades that most students would be glad to achieve but they do

represent underachievement for Oscar.

4.6.3 What are the processes that lead from Implicit Theories of

Intelligence to school outcomes?

Oscar was conscious of how he was able to rely on good retention and recall

when he was being tested: "I'd like to say I have a good memory- like

photographic" (yr9 CI). Oscar had a good memory, but he did not know how it

worked. It was effortless for him, but he had no explanation for how

knowledge becomes "sticky". In year 10 he was starting to realise that there

was more to GCSE performance than effortless recall and quick responses to

problems. "Sometimes it's not about what you know, it's more about how you

do it" (yr 10 AR). He had started to understand about the skills needed to

apply secure, deep knowledge:

> I didn't realise apparently that 15 to 40% of the actual marks are for
>
> knowledge and looking at graphs and interpreting them… the

comprehension, the extended questions, that was what really kind of got me. (yr 10 AR)

Throughout the academic reviews Oscar's reviewer kept trying to draw his attention - and his parents' attention - to a need for disciplined effort. It started in year 9: "you have been given a great brain, but to use it properly, you've got to apply all sorts of rigour and discipline to it" (yr 9 AR). Oscar admitted to his key weakness at this early stage in year 9: "What I do a lot of the time is, I see an idea and then just go for it, and don't really plan it out" (yr9 CI). A year later the same issue was still as a major area for Oscar to work on. In answer to the reviewer's question, "Do you ever plan out a piece of work, a piece of writing?" Oscar replied: "I should, but I don't" (yr 10 AR). Why, in spite of advice over a long period of time and an ability to articulate the issue so clearly for himself did Oscar not move into the implementation phase of this key learning strategy? He said something interesting about writing in his year 9 curriculum interview:

When I'm asked a question I can just flick into the concentrating mind and I can just think about it but when you're writing I find it… maybe not tedious but something like that as if it takes longer to convey what you're thinking onto the sheet like if I just said it and it just came up it'd be a lot easier and I think it's also like the structure, like when you're asked a question you don't really need to structure it , you just say the answer but when you're writing you need to say like really clever points. (yr 9 CI)

He was frustrated that it took longer to write something than just say it, but he was also reluctant to structure his thoughts in order to write with

sophistication. This structured sophistication in written responses allows students to demonstrate the higher order skills of analysis, evaluation and synthesis that underpin the assessment objectives for high grades at GCSE. Oscar's reliance on effortless recall and on quick problem-solving was not helping him to develop his learning beyond what came easily to him.

He seemed to lack metacognitive awareness or the effortful approach that would turn metacognitive understanding into self-regulation. He was also very self-contained and did not appear to see others - peers, teachers or family - as people who could be involved in his learning. In year 9, he reflected that part of increased effort in French is "to contribute more in class" but said little more about why it might help him to develop his language skills. It was suggested on his report. Oscar said little about his peers or teachers in any of his interviews. Had his very contained and self-reliant approach somehow disconnected him from the resource that is his community? Most of his peers in the study cohort found connecting with teachers and peers helpful when they were developing strategies for resilience and meta cognition, but it was difficult to find evidence that this was something Oscar had been able to do. Oscar expressed intrinsic motivation when he talked about the aspects of learning he enjoyed, especially drama but without a developed metacognitive strategy, resilience, and engagement when he experienced setbacks - like realising that for high order skill development he needed to be more rigorous and sustained in his approach – then Oscar decreased his effort.

4.6.4To what extent are there more complexities involved in the translation of Implicit Theories of Intelligence into outcomes? e.g., the social and reciprocal nature of education, or the role of communities, families, and parents?

By year 10 Oscar's grades were declining and, even though she had been part of academic reviews his mother was puzzled: "I don't understand why that is, when the effort is so… He is keeping it for the finals" (yr 10 AR). She had a belief that his natural ability would see him through and was focussed on his emotional well-being in the face of low grades: "I know he is phenomenal in all sorts of ways, and I imagine that Oscar would feel quite upset about it, wouldn't you?" (yr 10 AR). She did know what the issue was: "That's it, the technique and the writing. But that's a common theme, isn't it? Nobody knows better than Oscar" (yr 10 AR).

Oscar was passionate about drama and wanted to go the drama school, "because I really, really enjoy it." In his year 9 interview Mum said she was "dubious" about his taking art: "I don't want him to be taking the easy option." Later she is uncomfortable with his taking drama and art, but Oscar was motivated by the creative subjects: "I like art, because I can express myself" (yr 9 AR). When Oscar's mother realised that Oscar needed to be for more disciplined in his approach to study, she remarked, "That is something that could be addressed, but obviously it would have to be a phenomenal amount of effort" (yr 10 AR). Her use of the passive, along with the intensifier when describing effort was noteworthy. She did not tell him he needed to work

harder or differently. When Oscar talked about what he needed to do to improve he knew: "I should, but I don't."

There is much that is interesting in what Oscar – and his parents – did not say, especially in relation to his connection with school. Unlike most of the other participants, he said little about his peers, his teachers or his community. He used the pronoun "they" to describe "people who find it hard to learn" when he talked about his mindset across the curriculum in year 9. He showed an awareness that there were peers who seem skilled at practical subjects for example textiles, but again his reference suggested remoteness: "Some people are born with like a knack for it" (yr 9 CI). Oscar was unlike others in the cohort in that he made no references to peers or teachers as being involved in his learning. It was as though he existed separately from them - they were "other". He did understand the metacognitive processes that would help him to demonstrate his understanding effectively but was reluctant to commit himself to the level of self-regulation that it involved. Intrinsic motivation came from a feeling that his memory and problem-solving abilities would allow him to perform effortlessly or from drama where he was always able to say, "I can do it".

Oscar's mother supported this view that he was highly intelligent – and male- and would just be able to "do it" in the examinations. She was reluctant to subscribe to the view that effort allied to growth goals would lead to academic success.

In some ways Oscar's eschewing of effort and reliance on innate intelligence typifies fixed entity thinking, particularly when he stated that people who were less intelligent were the ones who needed to work hard. This did not tell the whole story for Oscar though. His main issue was a frustration with "slow learning". He struggled with the disciplines involved in language learning or writing as they did not give him the instant gratification he sought from tasks. Without a strong parental voice supporting his teachers' exhortation to take time to practise properly, Oscar's grades and then his efforts declined. Sadly, for Oscar, the subject he excelled in was drama, which his mother did not consider to be a high value subject.

4.6.5 The one-shot interventions around mindsets create marginal impacts that are difficult to sustain: what CAN schools do to improve the learning experience and outcomes for children?

Oscar's story could have unfolded differently had he had his Implicit Theories of Intelligence challenged so that he could understand that his early identity as an able learner was not the end of the story for him: effort would indeed have helped him to achieve growth. However, Oscar needed more than this. He needed to understand why slow learning was challenging for him but why it was important. He needed clearly articulated models of the stages in producing a high-quality piece of writing that were scaffolded and supported by expert teaching. Unfortunately, the thinking in the English department at the time was that to prepare students for the sustained writing challenge of the new GCSE younger pupils should sit and write timed pieces. Oscar also

needed parental understanding of the importance of practice and effort to achieve academic growth so that there was matching support in the home. Finally, Oscar's self-containment and sense of his isolation as a learner could have been challenged had it been understood. The descriptions of learning offered to him and his parents needed to articulate how learning is a social and reciprocal process: the exhortation to "contribute more in class" was something Oscar struggled to understand.

Figure 4.5 illustrates the relationships between Oscar's prior experiences, family narratives, lived experiences of secondary school and his learner identity.

Family influence
Mum thinks he'll do everything at the last minute because he's a bright boy
Mum concerned that the effort involved in closing the gap would be overwhelming

Prior experiences
Learning has come easy
High cultural capital
Problems with handwriting and extended writing not addressed – masked by ability

Learner Identity Paradigm
Borderline intelligence theory: effort is for people who aren't born with high intelligence though
No SEN but struggles with handwriting and presentation
When faced with setbacks like low examination marks at KS4 his effort declines
He knows he needs to use strategies like planning but he can't
He says little about the social or relational aspects of learning
He is motivated by his enjoyment of Drama but this sense of intrinsic motivation is not apparent in most other subjects
He hasn't put any of his metacognitive planning into action

Current Lived Experience of School
Finds problem –solving and memory effortless at KS3
KS4 has presented significant challenges around extended writing, high order skills in examinations and sustained effort
His performance and effort have declined dramatically at KS4
Enjoys Drama very much and wants to pursue the subject

Fig. 4.5 Illustration of the dynamics in Oscar's case

4.7 Vicky – I just want to blend in

4.7.1 To what extent are mindsets binary? Are children simply growth or fixed-entity, or do mindsets vary across different activities?

When I first interviewed Vicky, she was unsure of herself and having "wobbles" as her mother put it about her abilities and her performance. Some of the uncertainty she talked about was at odds with her Intelligence Theory. At 4.0 her score indicated that she was an incremental learner, but she scored lower for the third question. She thought that you could learn new things but that this wouldn't change your basic intelligence. She explained what that means for her learning:

> I think it varies depending on what I'm learning for some lessons I think that for some lessons if I keep on revising and keep on going over things it does make it easier but then for some things, I just don't get it and sometimes I just feel like… oh, you know. (yr 9 CI).

She identified subjects that needed a high degree of fine motor skill as problematic for her: "sometimes if it's really small like sometimes my hands like shake if I'm trying to do something really carefully" (yr 9 CI). Thus, she found art, textiles, and handwriting challenging. Left-handedness was an added complication: "my handwriting was not very good, and they always used to say it was because I was left-handed" (yr 9 CI). Although she got frustrated about this lack of skill in practical subjects she knew that these were not going to be subjects she would pursue at GCSE and, like many students

who are doing well at "academic" subjects this did not worry her. Her main frustration came because she would like to be good at subjects like art and she compared herself to others who were proficient: "they're amazing at art, and I just think I want to be like that" (yr 9 CI).

This awareness of her peers in lessons was important to her. She was anxious in theatre arts: "I feel that everyone's just starting at you even when I know they're probably not" (yr 9 CI). She worried about not being able to keep pace with the others in the top sets she was placed in on transition to secondary school: " because I didn't get it straight away I used to panic and go on you know I shouldn't be in this set" (yr 9 CI). This "imposter syndrome" was something she expressed several times during her first interview in year 9. She talked about not belonging in high ability sets:

> I didn't feel like I belonged in set one in year 7 and year 8 and I used to go home every maths lesson and tell my mum about how you know everybody got it and I didn't, and I only got 4 and everybody else got like 20 but she said to keep persevering and they'll put you in the set that you should be in and I've stayed in it. (yr 9 CI)

She talked about how she used to panic if she could not do something straight away and when asked about the reasons for panic she explained:

> I think it's just because other people can do it I feel like I should be able to do it because I'm in the same set as them whereas I know that everybody learns at different stages I think it's just the first of oh no people are getting this and I'm not. (yr 9 CI)

She added: "I just, I feel like I like to blend in sort of so if I don't get it then…."
"I just don't like not being able to get something that some other people do I think" (yr 9 CI).

Growth Mindset Theory would explain this anxiety about being seen to be deserving of a place in set 1 as symptomatic of a fixed-entity mindset where early judgements of high ability need to be validated by not appearing to need effort to succeed. There was certainly an element of that in Vicky's learner self-concept in spite of her appearing to have a growth mindset on the questionnaire. At times she talked of lessons as validation or performance opportunities with the resulting anxiety that follows any perceived underperformance: "I think I always want to show the best I can do and I feel like if I don't get things in lessons than I haven't shown the best of my ability" (yr 9 CI). When pressed on who she wants to show her best ability to she replied: "I think it's just myself often, just showing that I can do it even though it feels like I can't" (yr 9 CI). This performance anxiety caused particular problems for her when the lesson asked for originality or creativity: " you know my mind sort of closes up " and "it's the initial thinking outside the box- what could you do?" (yr 9 CI). Performance anxiety also meant that she did not use any of the past tense verbs she had been learning in her French examination, "because I was really afraid to get it wrong" (yr9 CI). Why then, when Vicky displayed strong traits of a fixed-entity mindset did she work so hard and make outstanding progress?

Vicky's attitude to effort was certainly what we would expect from a student with a growth mindset, even though an anxiety around proving her intelligence is a dominant feature of her early secondary school experience. Her consistently high effort grades certainly suggest that she believes in effort. This is a significant part of her approach to learning throughout her secondary school career.

4.7.2 Do Implicit Theories of Intelligence have an impact on school outcomes such as grades and destinations?

Vicky did extremely well at school. As she was about to sit her GCSEs her teachers were predicting that she would achieve 8 grades higher than her DfE median predictions and this was borne out by her mock examination performance which showed a range of grades from 6s to 8s, whereas her medians sat at 5s to 7s. Her Cognitive Ability Test scores put her in the above average range at 111 but this score would not usually lead to the highest grades being predicted at GCSE. She had applied to sixth form, was certain of getting onto her chosen courses and was an accomplished and assured learner whose consistently high effort grades showed that she had worked hard throughout her time in school and especially during Key Stage 4. She was, in every sense, a successful student who had made outstanding progress. Vicky's final grades confirmed this with 6s in art, English, mathematics and physics, 7s in biology, business studies, Spanish, and English Literature and 8s in chemistry and history. She progressed to A level study in the school's sixth form and continued to do well at school.

4.7.3 What are the processes that lead from Implicit Theories of Intelligence to school outcomes?

Vicky showed her resilience early on by trying to overcome her difficulties with handwriting: "When I got to this school I just tried it in a different way, and it just made it really easy" (yr 9 CI). She explained that as she built on her learning in computing, she could see that a difficult subject became easier: "I've realised that if you keep on working at remembering it makes it easier for you in class."

> I can see that if I really think about what I've learned in the past I can sort of apply it to my year 9 stuff and it sort of makes it easier- it sort of just clicked in year 9 I think because in year 7 and year 8 it was just like loads of information that I'd never really heard about before and that I really didn't understand because it was all a problem for a few years. (yr9 CI)

She reflected that she used to be "unconfident" in mathematics but:

> I've sort of got used to practising the less easy ones as well as just focussing on the easier ones and it makes it easier if you take the first step and apply it to maybe the fifth or sixth step that you're doing. (yr 9 CI)

Feeling confident was important to her and she acknowledged that it comes from effort: "I think when you're confident then you're more likely to maybe have a go at things that you wouldn't have before which is making your learning sort of better" (yr 9 CI). She could see this happening in different subjects. In RPE she was happy with her examination grades,

"Because I think that I'm getting the hang of it more because the practice is helping me" (yr 9 CI). She found physics the more difficult of the three sciences but undeterred she, "Realised that there's just these ideas that you just apply to questions like maybe aren't worded the same, so I just have to like strip back the question and then I understand it more" (yr9 CI).

How did she know that her efforts were paying off?

> I saw that I'd stayed in the sets that I wanted to be in and that I'd even moved up in some that I just sort of thought that whatever I'm doing it's working so if I just carry on and try hard it'll just work." (yr 9 CI)

She worked hard to improve her memorisation for examinations: "It takes me a long time to get things firmly planted in my head" (yr 9 CI) and "I have to keep going over and over it, like after Christmas that's when I started revising to make sure that I got the easiest possible techniques" (yr9 CI). Not only was she therefore highly self-regulating, but she was also prepared to put the effort in to plan, monitor and evaluate her metacognitive strategies:

> I found that the best one was getting up at like 9 o'clock doing a few hours then maybe going for a walk or meeting my friends and then coming back and doing a few more hours instead of because I used to be up really late in the morning and then I don't know doing whatever I liked and then revising all afternoon and it really didn't work. (yr 9 CI)

She had been active metacognitively since early on in Key Stage 3. In English she was struggling to master the new technical terms needed to write analysis:

I wrote down all the words that I didn't understand, and I asked like what they meant in the lesson, and I went over then that night and I found it easier to remember them and now I find it's a lot easier to use these words. (yr9 CI)

She told me that English was her favourite subject and that she was happy to respond to feedback to improve her work: "If there's something I need to really improve at I look back at the comments" (yr 9 CI). She had found learning dates in history challenging but had applied her usual high level of effort to the problem: "I practise them, and I keep on practising then I can see that when I get them right it makes my writing more factual" (yr 9 CI).

Like other students I interviewed in the case study cohort, Vicky found the innovative geography formative assessment method helpful and encouraging: "There's a geography star and I really like them. Because it shows me what progress I've made and every time I see that I've made progress it makes me more confident in myself and when I'm more confident it's easier for me to you know ask questions and have a guess at things that maybe I wouldn't have" (yr 9 CI). This was quite a departure from the student who wanted to "blend in" and "belong" in lessons. Why were geography lessons occasions when she was so prepared to risk being wrong? It could be that she really liked her teacher: "I find it really helps if you like the teacher and if you have a sort of understanding relationship with them" (yr9 CI).   She knew to access science A levels eventually she ought to do the separate science offer at GCSE, but she was concerned about physics, which she struggled with more than the other two sciences. As with all her subjects she knew what she needed to do:

"I just need to revisit it more, make sure I make a conscious effort to remember that I might not be as strong in physics."

47.4 To what extent are there more complexities involved in the translation of Implicit Theories of Intelligence into outcomes? e.g. the social and reciprocal nature of education, or the role of communities, families and parents?

At her academic review, Vicky's mum reinforced this view of Vicky hard working and undeterred. She was proud of Vicky for her examination results but even more proud of the way she had approached her studies: "She knows what she has got to do, gets on and does it" (yr 9 AR). She was pleased with the way Vicky hadn't shied away from subjects she found difficult: "You didn't shy away from physics and the languages, which you found the hardest. You tended to do that subject first didn't you?" (yr9 AR) and "We've talked about the fact that there is no point in shying away from the subjects" (yr9 AR). Vicky and her parents talked openly about what was difficult and what effort looked like, confronting any anxious moment that mum called a" wobble". They attended subject reviews and talked about how Vicky was worried about keeping pace with her peers, advising her to "Just do your exams. See what happens if they're not great we'll go in and have the conversation" (yr 9 AR). With this balance of support and challenge Vicky did well in her examinations and proved to herself that effort pays off in terms of her confidence.

When I asked her again after her examinations if she still felt that she did not belong in her sets she said, "I don't agree with it as much, I sort of focus on my own work, because everybody has different strengths" (yr 9 AR). High effort levels, coupled with deliberate metacognitive strategies had moved Vicky's learning on until she could manage her anxieties around comparison, validation, and performance more successfully. The conversations Vicky had at home had resonances of growth mindset thinking in them. When she went home worrying about keeping up in mathematics her mother's advice was to, "keep persevering and they'll put you in the set that you should be in" (yr 9 CI).

When Vicky talked about the influence her family had on her learning, she describes a supportive family who understood the learning process because they had been successful learners and who gave Vicky a wide range of cultural and learning experiences outside school. She was fortunate to have travelled in Europe regularly: "When I was little we always used to go like to Sardinia and places in Spain" (yr 9 CI). She loved her sport and played in and out of school: "I'm in a netball team outside of school and it's for the Northwest" but she added tennis to her hobbies, "because my mum used to play tennis and we play it when we go on holiday and she said I think you'd be quite good, so I sort of need a summer activity, so I decided to do tennis" (yr 9 CI). She liked biology and chemistry and attributed that enjoyment to family influence too:

> My mum was a biochemist and she worked for Boots making new
> meds and stuff, so I like being able to like talk to her about it and have

> discussion with her about maybe what they mean and things and with
> chemistry well my godmother was a chemist so science sort of runs
> through the family and just really like, I don't know, I get biology and
> chemistry. (yr 9 CI)

She enjoyed food technology because, "My dad really enjoys cooking so I've been cooking with him since I was about 6 or 7 so I just like carrying it on" (yr9 CI). She also had a well-developed private reading habit that stemmed from her home environment:

> I read most nights like before I go to bed, I'll go up half an hour earlier
> and I have – you know when walls are turned into bookshelves? - I
> have a whole wall of books that I've read, and I just keep them all and I
> keep on looking at them and remembering them. (yr9 CI)

With a growth mindset, supportive family able to provide a range of experiences and appropriate emotional support, above average cognitive ability and a strong work ethic, Vicky was doing well at school. However, her interview data tell a slightly different tale at times. Plagued by anxiety and doubt about her ability in comparison to others, keen to blend in rather than take risks, she still needed good teaching which overtly built her metacognitive strategies before she was able to say, "I'm just holding my own more than I was before."

4.7.5The one-shot interventions around mindsets create marginal impacts that are difficult to sustain: what CAN schools do to improve the learning experience and outcomes for children?

Vicky's story demonstrates the significance of a range of factors in determining the extent to which learners can achieve academic growth. Her parents were themselves successful learners able not only to steep their daughter in the "cultural capital" that is so desirable in our current assessment of progress at 16+ but also able to provide autonomy support when she was plagued by self-doubt and to attribute her progress to her effort and self-regulation.   In school, Vicky was supported by teachers able to model metacognitive strategies within their specialism.

One of Vicky's main challenges was the comparisons she made about herself and her peers. Like all the learners in the study, this was the main point of reference she used to calibrate her ability and her progress. This is probably not fully understood by schools and teachers when they set and assess children and even in the lived experience of the classroom and is worthy of much more attention from schools.

Figure 4.6 illustrates the inter-relationship between Vicky's family influences, her prior experience, her current experience of secondary school, and her learner identity.

Family influence

Emotional support

Growth Mindset thinking

Travel opportunities

Parents successful learners

Quality time as family : sport, cooking etc

Private reading habit well established

Prior experiences
Support for handwriting
and pen hold
Top sets on transition to
secondary caused
anxiety

Learner Identity Paradigm

Growth Mindset 4.0

No SEN (other than slight issue with fine motor skills and handwriting)

Highly motivated to learn -leading to effective self-regulation

Successful learning leads to self-actualisation

Plans, monitors and evaluated metacognitive strategies

Highly resilient: perseveres when highly anxious and observes success as a result

Current Lived Experience of School

Top sets give her validation

Anxious about comparison to others and need to belong and blend in

Responds well to feedback , especially when directed to metacognitive strategies

Is most at ease and able to take risks when she perceives a good relationship with a teacher

Fig. 4.6 Illustration of the dynamics in Vicky's case

223

Chapter 5 Cross-Case Findings

The case studies in Chapter 4 looked closely at the learning experiences of 6 children. The original group of participants numbered 11 which meant that across case findings could be drawn from this larger group. Andy, Keith, Mary, Kai and Oona also took part in the curriculum interviews and the academic reviews in years 9 and 10 with their parents and I was able to follow their progress in terms of school data, examination results and destinations to look at themes across all 11 children's journeys through school. In this section I discuss the cross-case findings using the research questions as a set of main headings. In response to research question 4, which extends the study to consider wider issues mediating between Implicit Theories of Intelligence and progress in secondary education, I consider the role of parents and examine more closely the data elicited from parents' contributions during the academic reviews.

5.1 To what extent are Mindsets binary? Are children simply growth or fixed-entity, or do mindsets vary across different activities?

5.1.1 Mindsets are complex and vary across contexts.

The participants gave a varied and nuanced account of their Implicit Theories of Intelligence, not all of them in line with their mindset score. Alex and Beth were both adamant that you could become more intelligent if you "worked for it" but had fixed-entity scores on the questionnaire and did show helplessness

responses, albeit uniquely different ones. Several participants talked about others having a "knack" for something or a talent, confining this concept to subjects like music, art, textiles or design technology. Oona talked about a peer who she felt had been born with high intelligence, and Oscar and Andy both felt that people born with less intelligence could get cleverer if they worked hard whilst those born with high intelligence would not need to work hard.

Vicky talked about having different mindsets for different aspects of the curriculum and in fact all participants demonstrated this in their interviews, detailing subjects where they felt that they were getting better by working hard and others where hard work was not going to pay off for them. Participants would say that they were "good at "or "not good at "different subjects on their curriculum and tended to think more incrementally about the subjects they said they were "good at". Implicit Theories of Intelligence were therefore complex and nuanced beyond the descriptors "fixed-entity" and "incremental". They varied according to the curriculum and according to participants' wider understanding of the concepts of intelligence and learning.

5.1.2 Participants also had implicit models of learning.

Participants were trying to find language, including metaphor and analogy, to explain their internal models of the learning process. Some participants talked about the brain as a container, in which they tried to get learning to stay, for example, "it just puts stuff in your head" (Kai). Others saw learning as a

process, like Ellie's two stages of "picking up" and "sticking". Keith had come across a more scientific description of learning – probably in a personal development session - "you can expand your brain as well if you revise then you can remember it".

Oona described her brain as something finite when she said, "there's a limit to how much your brain can take" and was aware of her head as a place where learning takes place. She used popular colloquialisms to describe difficulty: "It's just something I can't get my head around". She talked about "holding numbers in my head" as a challenge and the main problem with writing – which she enjoyed – is "Because I rush, I've got so many ideas in my head because I haven't written them down". Spelling was a problem at times: "I don't know I find it quite hard to stick it in my head". Was there a connection between the child's concept of the process and their implicit theories? Oona's idea of the brain as a container for ideas which then enter and leave it without her having much control was consistent with her fixed entity thinking. Kai said something very similar when he explained learning: "If you learn stuff, I don't really find it develops your intelligence it just kind of puts stuff in your head". Oscar, with his idea that effort is something people with lower intelligence need to put in to get cleverer, had an idea of intelligence as a ladder or hierarchy. "I'd say that you are born with a certain amount of intelligence which puts you up there". Thus, he posited that fixed entity thinking is associated with being intelligent. Incremental theories are needed for those who are somehow lower down on this scale: "the people that find it hard to learn but eventually if they spend hours and hours revising and such then they

will get up there they'll get on more and achieve". Alex talked about the need to "get your intelligence built up", but said little more in his interview, focussing on other concerns around school and his learning.

Keith had had access to some information about the brain's malleability and understood that "you can expand your brain". Ellie had two expressions she used repeatedly to describe understanding and then remembering: "picking things up" which describes the cognitive process and then "sticking" which describes memory. Her friend was good at geography, "because she's just really good at picking things up and they stick in her brain a lot more then". Ellie described developing intelligence as two processes, understanding and remembering. Had Ellie's incremental self-theory led her to describe processes rather than an object when she talked about intelligence? Finally, Vicky whose hard work and achievements in school belie an uncertain theory of intelligence, had a range of concepts at her disposal. She talked about cognition as "getting it" quite often, feeling under pressure when she did not "get it" straight away. She also talked about process when she mentioned, "getting the hang of it". However, she still included the notion of her head as a container for memories: "it takes a long time to get things firmly planted in my head".

These children described cognitive processing as something that sounded tiring, physical or uncomfortable, especially Ellie who was somehow gathering understanding like a harvest, constantly picking things up. It was true that some of these expressions were colloquialisms they had heard others use but

I did wonder if there was some determinism in the language influencing their ideas about learning here. It was only the tiniest pinprick of light in the black box but really listening to the language children used when they described what learning felt like to them was a helpful insight. More successful participants described implicit models that had strong metacognitive processes in them whereas those who struggled and whose outcomes were poor had deficit models and couldn't explain how learning happened. This was not related to base line ability in these children. Both Oscar with his high CAT scores and Alex with his low scores had deficit models.

It was when I had coded and analysed this theme emerging from the data that I realised that these children were creating their own "learning literacy" in a vacuum created by a lack of language available to them to describe learning. They were reaching not only for the words and phrases that helped them to articulate their understanding of their own learning but also for a model or structure of the process itself. It led me to ask, where do children get their ideas about what learning actually IS? How do teachers contribute to this? How do children get to check their ideas out? Do their ideas help or hinder their learning? Is there a connection between this personalised learning literacy and the experiences of these individual students as learners?

5.1.3 Implicit Theories of Intelligence are an element in wider learner identities.

Implicit Theories of Intelligence were part of a broader, more complex learner identity. Each child had had a unique set of experiences and influences that helped to form their Individual Learner Identities. This was made up of family influences, prior experiences of learning and wider experiences of learning outside school. Their Implicit Theories of Intelligence influenced the way they interpreted those experiences, but experiences could also influence their Implicit Theories of Intelligence. Often the definitions of "good at" or "not good at" something came from family narratives and were more usually consistent elements of learner identities, creating a lens or filter through which participants processed their learning experiences. The participants were piecing together a range of information sources and types to synthesise a learner identity for themselves. Figure 5.1 Individual Learner Identity Formation represents the three interrelating elements that made up the participants' sense of themselves as learners. It places Implicit Theories of Intelligence in a more complex model of interacting parts and suggests that the children's idea of how learning happens - I have termed this their Implicit Model of Learning - and their competency beliefs influence one another to form an Individual Learner Identity.
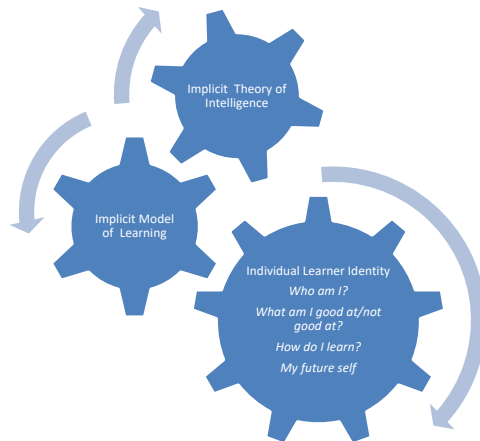
Fig. 5.1 Individual Learner Identify Formation

This process of learner identity development was going on all the time.

Participants were reflecting on early experiences of school and drawing on

family narratives around themselves as learners. They were calibrating their

ideas about themselves, taking in data about their ability and progress based

on setting, test results and feedback, comparing their abilities to their peers',

assessing their learner abilities in terms of their literacy levels and ability to

remember. They were acknowledging skills (or a lack of them) across a broad

curriculum range extending beyond the traditionally academic, discovering

what elements of the curriculum interested them or demotivated them, adding

in interests and aptitudes discovered out of school, identifying where they

were confident or unconfident and imagining their future selves. As part of this

identity, they held their Implicit Theories of Intelligence: not only whether or

not they believed intelligence to be innate but also what intelligence was and

what learning looked and felt like, in other words their implicit model of learning.

Learner identities were more multi-faceted and complex than a simple Implicit Theory of Intelligence. Theories of intelligence and personal models of the learning process were important elements of their identity but the way they intersected with other elements of identity, especially the experience-based ones around the lived experience of school, was significant. Children like Alex and Lennie, and to a certain extent Kai and Oona, looked beyond school for their learner identities, whilst children like Beth, Vicky, Keith and Andy found the interplay between their experiences and their learner identities brought them closer to identifying as successful learners within the school system.

5.2 Do Implicit Theories of Intelligence have an impact on school outcomes such as grades and destinations?

Although this is a cohort of 11 children in one school, the detailed study of their journeys suggested that, while Implicit Theories of Intelligence can have an impact on outcomes, both in terms of academic attainment and destinations at 16+, other influences and issues in their lives were either reducing or amplifying any effects of those theories.

In Table 5.1, I have plotted the trajectory of each participant, detailing their Intelligence Theory or mindset score, their baseline cognitive ability score, and disadvantage markers against the processes observed in the longitudinal

data (see Chapter 3, Table 3.9 Longitudinal change for individuals and across cases). I have then added outcomes data in terms of GCSE and level 2 attainment as well as destinations.

Pupil	Itol score	CAT ave	SEN/ FSM?	Processes	Outcomes
Alex*	3.33	92	SpLD	Reduction in effort Strategic motivation Disidentification Parental distancing Parental frustration	Science – 3 2 English – 2 2 Geography- 2 Mathematics -2 Countryside L2 – A Significant underachievement Went onto agriculture apprenticeship
Andy*	3.62	102		Strategic motivation Academic growth Parental support	Engineering – level 2 Merit Science – 6 5 6 Design – 7 English – 4 4 Geography – 4 Mathematics – 5 Achieved above medians – accessed level 3 course at Further Education college
Beth	3	105		Emotional distress Intrinsic motivation Academic growth	Science – 6 5 6 Business Studies- 6 English – 8 7 French – 5 Geography - 6

Pupil	Itol score	CAT ave	SEN/ FSM?	Processes	Outcomes
				Parental support	Mathematics – 6 Textiles - Distinction Achieved at Upper Quartile, went onto A levels in sixth form, became Head Girl
Ellie	4	103		Reduction in effort Emotional distress Parental distancing Parental frustration	Science – 4 3 Art – 4 Business Studies – 2 English – 3 4 Food – 3 Geography – 3 Mathematics – 3 PE – 3 Significant underachievement – enrolled on level 2 course at FE college, Discontinued after 1 term
Kai*	2.33	113	ADHD	Reduction in effort Emotional distress Disidentification Parental distancing Parental frustration	Home schooled in year 11 At risk of criminality Music – level 2 pass Mathematics -5 Science-5 5 English- 3 Significant underachievement
Keith*	5	118		Intrinsic motivation	Engineering – L2 Distinction

Pupil	Itol score	CAT ave	SEN/ FSM?	Processes	Outcomes
				Academic growth Parental support	Science – 5 6 5 English - 4 6 French – 5 Geography – 7 Mathematics – 5 Achieved above medians. Went onto A levels in sixth form
Lennie*	2.33	89	SpLD /FSM	Strategic motivation Disidentification Parental distancing	Science – 3 2 Art- 4 Buiness Studies – 2 English – 3 3 Mathematics -2 Materials EngineeringL2 – A Achieved medians. Went onto Army Foundation College
Mary	4.33	118		Intrinsic motivation Academic growth Parental support	Science – 7 6 Art- 5 Business Studies – 7 English – 5 6 History – 6 Mathematics – 7 Religious Education- 8 Spanish – 5 Achieved above medians Went onto A levels in sixth form

Pupil	Itol score	CAT ave	SEN/ FSM?	Processes	Outcomes
Oona*	2.66	112		Emotional distress Strategic motivation Intrinsic motivation Academic growth Parental frustration	Sports – level 2 merit Science – 5 5 Business Studies – 5 Design – 5 English – 6 5 Geography – 5 Mathematics – 5 Achieved above medians Went onto equine training in the military
Oscar	3.66	127		Reduction in effort Intrinsic motivation (*limited subjects only)* Parental frustration	Art – 3 Science – 7 6 7 Drama – 8 English - 6 6 French – 6 History – 5 Mathematics – 7 Achieved mostly at medians Went onto A levels at sixth form
Vicky	3.66	110		Intrinsic motivation Academic growth Parental support	Art – 6 Science – 7 8 6 Business Studies -7 English – 6 7 History – 8 Spanish - 7 Achieved at UQ Went onto A levels in sixth form

joined new Studio School for KS4

Table 5.1: Implicit Theories of Intelligence and Outcomes

There were four fixed-entity thinkers in the cohort, Beth, Kai, Oona, and Lennie. Beth, Oona, and Lennie achieved above their DfE median predictions and progressed onto their chosen pathways at 16+ having worked hard to achieve their aspirations. Fixed entity thinking presented them with challenges to overcome when they were learning but they were nevertheless able to succeed. Kai's Attention Deficit Hyperactivity Disorder and challenging issues out of school around home and his community meant that he struggled to engage with school positively during Key Stage 4, in spite of his high baseline cognitive score. These other issues, especially the late ADHD diagnosis when he was in year 10, were possibly more of a contributing factor to his struggles than his implicit theories although those theories demonstrably did not help him to engage with learning.

There were also contradictory trajectories in the group of incremental theorists. Keith and Mary conformed more obviously to the classic profile of incrementalists by working hard and dealing positively with setbacks, but Ellie's story was different. Learning at school became challenging for her, she did not manage to achieve level 2 by the end of compulsory education and continued to struggle with learning at college.

The four borderline theorists were also a mixture of students like Vicky and Andy who worked hard and did well in contrast to Alex and Oscar, whose

effort levels and school progress data declined dramatically. Alex's grades were below his DfE median expected grades and meant that he needed to re-sit his English and mathematics whereas Oscar should have achieved higher grades than he did overall but did well in the subjects he enjoyed like Drama and continued to A levels in subjects he enjoyed in sixth form.

The longitudinal study of these participants thus allowed for a deeper understanding of the factors other than Implicit Theories of Intelligence playing into their lived experience of education and adolescence.

5.3 What are the processes that lead from Implicit Theories of Intelligence to school outcomes?

The cross-case analysis, together with the detailed exploration of the case studies, afforded insights into processes that worked to promote effective learning at school. The main processes revealed by the analysis - motivation, metacognition, self-regulation and responding positively to feedback - are known to practitioners and are the subjects of extensive research in their own right (see Chapter 2 Literature Review: Section 2.6 Inside the Black Box) but it was interesting to see how they combined and responded to individual learners' Implicit Theories of Intelligence along with the learner identities and personal models of learning that analysis revealed were influential. The analysis afforded glimpses of the mechanisms operating between the learners' Implicit Theories of Intelligence, identities and models of learning and their outcomes at the age of 16 in terms of achievement and progression.

It allowed some light into the black box and, whilst terms like motivation, metacognition self-regulation and feedback are already used in schools, the analysis afforded an insight into the interplay between Implicit Theories of Intelligence, learner identities and implicit models of learning on those mechanisms.

5.3.1 What are the processes inside the black box?

Each child took their influences, experiences, learner identities, implicit models of learning and Implicit Theories of Intelligence into the school space where they encountered a set of mechanisms that had the potential to work together to create academic growth: motivation, metacognition and self-regulation, followed by responses to feedback.

As discussed in Chapter 2: Literature Review, motivation, metacognition and self-regulation arise from distinctive fields of study which have overlapped and informed one another in the last two decades. Motivation is the desire to apply effort to achieve an outcome. Originally interpreted as a rather biological instinct to survive and compete, later studies suggest that motivation to learn is influenced by rather more complex factors, for example, self-efficacy beliefs, intrinsic enjoyment and interest or attribution (Weiner, 1990). In this study, participants described a high level of motivation in terms of their intrinsic enjoyment of a curriculum area combined with a sense that they were competent. This allowed them to develop field-specific study habits, made them resilient to setbacks, and inculcated helpful self-efficacy beliefs.

Motivated children were able to develop metacognitive strategies within a subject as a result of their self-efficacy beliefs. This different field of study, focused on learners' understanding of how to learn, clearly dove-tailed with motivation theories in this particular study so that the connection could be seen between intrinsic motivation, which led to self-efficacy beliefs in motivated learners, and the development of metacognitive strategies when learners' competency beliefs allowed them to reflect on the methods they were using and made them resilient to setbacks (Education Endowment Foundation, 2017, Muijs & Bokhove, 2020).

Self-regulation literature adds a complexity to this discussion. Whilst the ability to choose metacognitive strategies and make some decisions about the amount of time and effort expended on learning tasks is defined in much of the literature as self-regulation, there is an element of self-regulation that is about self-control or will-power that is at times independent of metacognitive behaviours. (Moilanon, 2007, Muijs & Bokhove, 2020). Some participants were capable of articulating the metacognitive strategies that would help them to learn effectively but could not self-start, defer gratification, or resist distraction sufficiently to expend the levels of effort required to study effectively.

Children like Beth or Vicky whose implicit models of learning were based on metacognition, self-regulation, motivation and responding positively to feedback were most likely to have a well-functioning set of interlocking mechanisms and achieve academic growth. Children like Oscar or Alex, with

deficit models, for whom the learning process remained rather a mystery, were less likely to use the mechanism to capacity, if at all, and less likely to make academic progress. The relationships between Implicit Theory of Intelligence, implicit model of learning, learner identity and the mechanisms forming the lived experience of learning were dynamic and reciprocal whereby participants calibrated and re-calibrated their identity, their implicit learning model, and their understanding of the efficacy of the mechanisms.

This calibration was based on the information the children gleaned from their experiences: their ability setting, comparisons to others, teacher judgements of them in comments and marks, their performance in tests. Participants with metacognitive implicit models of learning used this information to evaluate the effectiveness of their strategies and efforts, to track progress and to reaffirm the value of their model. Children with deficit models found the information less useful and tended to become disheartened or worse. This inter-relationship is illustrated in Figure 5.2: The relationship between Learner Identity and the Learning Mechanism.
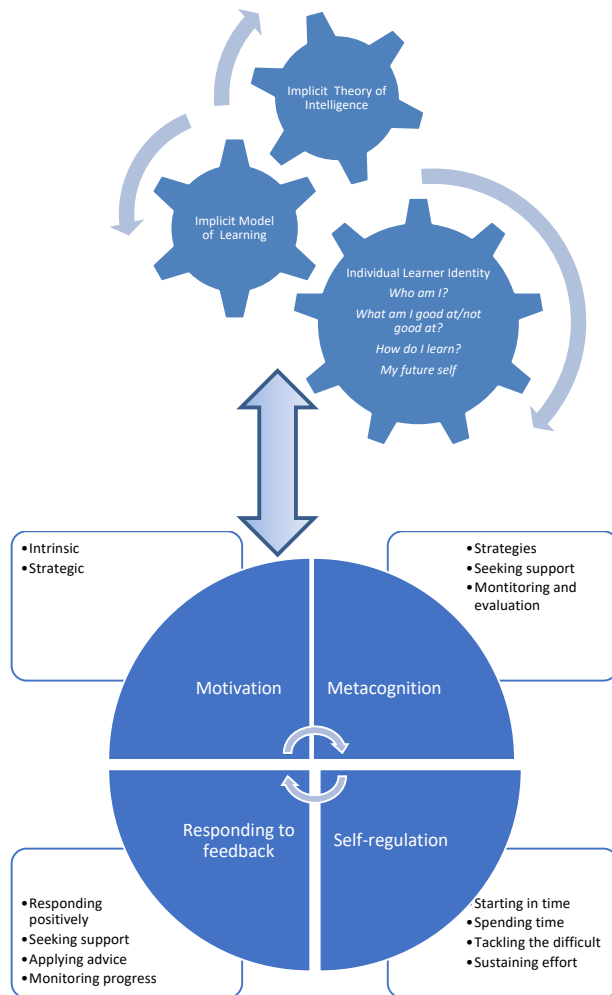
Fig. 5.2 The relationship between learner identity and Learning Mechanisms

This model is made up of the elements that recurred in the interviews. These elements were common to most if not all the participants but varied in terms of

their individual experiences so that they made up unique sets of moving parts inside the "black box". Each set of elements for each unique leaner interacted in a different way depending on the level and nature of their motivation; the security and sophistication of their metacognitive strategies; their self-regulatory abilities to self-start, self-stop, defer gratification and invest time and effort; their readiness to accept feedback and respond to it to develop their learning. These four main learning mechanisms were present in those children who made progress with their learning at school in terms of attainment, confidence, and progression at 16+. The four mechanisms showed signs of stress or inefficacy in the case of children who struggled to engage with school and whose attainment and resulting progression at 16+ were below expectation.

5.3.2 Motivation

An energy flowed into this "mechanism" by way of a participant's motivation. For several participants, the motivation was to "keep up" with peers, stay in high attaining setted groups and have tangible evidence that their hard work was paying off. Beth and Vicky for example were both working mainly to retain their place in a setting hierarchy at Key Stage 3 and were thus driven to achieve performance goals. Whilst they displayed anxiety around performance during their interviews, neither of them resorted to performance avoidance or to self-handicapping, however, which, according to Dweck, is a risk emanating from holding Achievement rather than Mastery goals (Dweck, 1999).

In the wider participant group, the main motivating factors were interest, enjoyment, and confidence in their ability in the subject, in other words intrinsic motivation (Murayama et al, 2019). Rather than working hard for rewards or praise, the children talked about their enjoyment. Mary was "loving" English Literature whilst Oona found history "really interesting". For most participants motivation came mainly from a deep sense of interest and enjoyment and was accompanied by a confidence that the part of the curriculum giving rise to such intrinsic motivation was also an aspect of the curriculum for which they had a sense of efficacy. This aspect of learner identity was closely bound up with prior experience and family narrative.

Interest was sometimes connected to family interests. This was particularly the case with sports and the technical subjects but subjects like history - with its presence in popular culture – was also cited as an interest of parents by Ellie and Keith, leading to an interest for the student. Andy's interest in Design Technology came from his father's love of joinery and Vicky based her engagement with science on her conversations with her scientist mother and godmother. Whilst there is plenty of anecdotal evidence about the passing on of interests and passions within families like this, there is little to be found in the literature around motivation in the classroom on this topic. The role of parents in supporting achievement is written about extensively but the direct impact of family interests on curriculum-based motivation does not feature prominently (Pomerantz et al, 2007). Participants ranged across the curriculum in terms of their intrinsic motivation, with those who enjoyed the core subjects of English, mathematics and science or the English

Baccalaureate humanities and languages tending to make more progress across the curriculum than those who enjoyed the practical or creative subjects.

Instances of strategic motivation were less frequent. Alex was prepared to work hard at subjects that would be relevant to a future in farming. Andy wanted to do well in physics to support a future in Engineering and Lennie described his efforts to pass his army mathematics test. It was interesting that of all the participants these practically – minded boys were the ones who expressed a motivation based on expectancy-value, the value placed by a learner on the academic activity in question (Urdan & Turner, 2007). Alex talked about a negative form of strategic motivation, created by the need to resit English and mathematics during the post-16 phase should he not achieve grade 4s in them. He found that this was not sufficient motivation to sustain his studies.

Lack of interest was conversely the most commonly cited reasons for not wanting to work hard in a subject. This was often combined with a lack of prior experience or a lack of relevance to the family as was the case with music or RPE (religion, philosophy and ethics). All pupils in year 9 were deciding which subjects to continue at GCSE so there was an inevitable jettisoning of subjects that they were not enjoying, not confident in or they did not consider relevant. Option choices gave the opportunity to see the wider operation of an expectancy-value theory of motivation whereby children were making curriculum decisions based on their expectancy for success and the value of

the subjects on offer to them at GCSE (Urdan & Turner, 2007). The pattern here was mainly in the arts, practical subjects and RPE but children like Alex and Oona were adamant about not wanting to choose EBacc subjects. Oona disliked studying languages and felt that she had done so badly in them at secondary school that she was not taking a language at all. The degree of subject variability was interesting. Subjects like art, technology and music saw pupils who perceived that they had low skill levels struggle with motivation. Theatre arts had its added pressure of performance during lessons, leading to less confident students feeling embarrassed. Seeing peers with higher skill levels in these subjects added to the sense of demotivation. Only Andy stated that he was not going to persevere with a subject (RPE) because it would not be relevant to him in the future. Oscar found sustained practice and attention to detail "tedious" and Kai struggled to focus and to settle into effortful routines at home, probably due to his ADHD and levels of tiredness.

Alex was the most vociferously demotivated participant: during his year 9 academic review he simply refused to read. "If someone paid me a hundred quid to read a book, I wouldn't do it. It doesn't interest me at all." The participants were demotivated when they were unsure of the relevance of the subject, when they did not find it interesting or enjoyable, when they did not feel confident in it and, in the case of these students in year 9, when they were making option choices.

Failure setbacks like low marks or ability setting were responded to differently depending on the perceived relevance or levels of engagement with the

245

subject, in line with both expectancy value theory (Urdan & Turner, 2007) and self-efficacy theory whereby learners are more likely to persist with learning activities when they believe they are capable of succeeding (Bandura, 1997). For children like Beth and Vicky for example these setbacks did lead to performance goals and redoubled efforts in core subjects. When the subject was deemed peripheral, or specialist, participants tended to reduce their effort in the knowledge that they would soon discontinue the subject. The structure and nature of the curriculum played as much a part in children's motivations as any other aspect of their learning.

5.3.3 Metacognition

Motivation was essential but not sufficient, however. Successful learners in this study had managed to develop effective metacognitive approaches: they understood the stages in learning processes for different aspects of the curriculum (Quigley et al, 2018). For example, Mary understood the importance of repetition for memorisation. Andy was transferring a skill in marshalling arguments developed in RPE to English but rejected the technique of revising all at once for one of his sciences having attempted it in his year 9 examinations. He also observed that practising his French regularly meant that he found it easier and improved at it. He was monitoring the effectiveness of his learning strategies and displaying high order metacognition. Keith had found that techniques like "breaking things down" or using analogies were helpful to him as was active revision involving recall out loud. From their case studies it is possible to see in detail the metacognitive

skills developed by Beth, Vicky and even Lennie when the situation demanded it.

For the most part, this metacognitive understanding was implicit and supported by narratives from family members, often in real time as they were "walked" through solutions to setbacks and difficulty by parents. Vicky's parents had kept her calm when she had a "wobble" about languages, recommending she try her best in her year 9 examination and then see what that said about her progress. Beth's mother advised her to seek support whenever she was in difficulty with her learning or confidence. Andy's mother encouraged him to start revising earlier and to increase his effort levels a little at a time following his year 9 examinations, recognising in his review that this was something she had already seen in his study habits. Not only were these parents suggesting metacognitive strategies, but they were also monitoring the effectiveness of those strategies in real time, creating an "attribution loop" for their children and providing a running commentary that allowed their children to see the success of strategies. It was interesting to see the extent to which parents were able to support the development of their children's monitoring and control processes (Schwartz & Perfect, 2002). There is debate in the literature about whether or not it is possible to teach the skills of metacognitive control. The EEF document suggests that there is much that practitioners can do for example through modelling thinking and promoting metacognitive talk and is a useful guide for practitioners, however, there is very little recognition of the role parents can play in the development of metacognitive skills. The fact that independent study is the activity with the

highest demands on metacognitive awareness and takes place in the home means that the question of parental support for metacognitive development is an important one that should be explored.

5.3.3.1 The role of school assessments in developing metacognitive awareness

There were examples in the interviews of effective approaches to formative assessment by individual teachers and departments that laid out metacognitive approaches for pupils to follow. The geography star which deconstructed the subject and mapped out progress in an easy, non-linear visual, was the most appreciated by participants as it supported their monitoring of their metacognitive strategies, as Beth explained: "you do it from year 7 and you can see what progress you're making and how much better you're becoming". Effective metacognitive strategies heightened some participants' sense of self-efficacy and increased confidence and motivation.

Children like Alex, Kai, and Lennie had limited metacognitive repertoires and struggled to make sense of their lack of progress. Alex for example could only suggest "working harder" and "concentrating more" in order to develop his intelligence and struggled to articulate the reasons for his poor progress in a range of subjects: "I don't know why but I'm just not good at it really" eventually externalising the source of frustration, "I just feel like I'm not getting far because of my teacher 'cos I'm always getting told off". Kai struggled with memorisation, wondering if it "helps if someone's with me doing it", and

displayed mainly helplessness responses in the face of learning challenges. He found spelling hard but could only speculate "I guess it doesn't get stuck in my head as much as it does in other people I think". Unlike children like Vicky, Beth, or Andy whose parents supported their metacognitive processes, in the case of these boys there was more limited evidence of this working for them, certainly in the children's accounts. Alex and Kai's mothers were both supportive of their learning and did offer metacognitive ideas but for different reasons their support was something their children did not engage with: Alex prioritised his farming and Kai was contending with his ADHD. There were deeply complex issues involved in the disconnect between parental support for learning and these boys' take up of that support, not least of which were the boys' fixed entity Implicit Theories of Intelligence.

5.3.4 Self-regulation

The EEF report into Metacognition and Self-Regulated Learning uses the terms metacognition and self-regulated learning almost as though they are the same issue. In fact the report says little about the development of self-regulation beyond the suggestion that "setting an appropriate level of challenge" can develop children's self-regulation and motivation. (Education Endowment Foundation, 2018, p.18). Self-regulation theory is a much broader issue beyond the learning process and is applied to social disfunction as well as education. (Baumeister et al, 1994) but it is useful when trying to understand why some participants knew HOW to learn but struggled with the level of self-regulation needed to avoid distraction, defer gratification, and

spend time on practice. Children like Ellie, Oscar and Kai displayed negative emotions in response to the need to self-regulate. They all experienced strength failures and renegade attention issues to different extents, finding it difficult to avoid distraction and to start working independently at home. Ellie's parents described her tendency to become distracted by social media and to be emotionally involved with friendship issues which made it difficult for her to settle to meaningful routines. Oscar described a reduction in willpower when it came to slow learning tasks like extended writing or vocabulary learning. Kai describes the very strong distractions and then tiredness he was experiencing probably as a result of his ADHD. Being unable to meet the challenge of self-discipline and effort was disheartening for them. Oscar and Ellie's parents in particular were concerned about their being upset and supported them to decrease effort in the academic reviews. Oscar's mother was concerned about his response to low predicted grades in his year 10 academic review, "I know he is phenomenal in all sorts of ways, and I would imagine Oscar would feel quite upset about it, wouldn't you?". Ellie's mother says twice in the year 10 academic review that she "doesn't disagree" that Ellie's effort grades are low but follows this with counter arguments about the level of difficulty in the new GCSE and the loss of coursework. By the time her father has said, "She gets herself wound up about exams", Ellie has had the case made for continued low effort. Oscar and Ellie's contributions to these discussions were, however, likely to have been influenced by the situation and could well be a result of reluctance to have an open discussion with a senior member of staff about something that they perceived reflected on their parenting.

Conversely, children like Beth, Vicky, Mary, Keith, and Andy were all able to spend time and effort on practice, avoiding distraction and deferring gratification and were able to take their high levels of motivation, combined with their metacognitive understanding of the process of learning, into their studies so that, with the addition of effective self-regulation, they made good progress.

5.3.5 Feedback

Beth, Vicky, Mary, Keith, and Andy were successful learners who responded effectively to feedback, using marks, grades, setting and especially high-quality formative assessment to feed into their metacognitive strategies so that the cycle continued to create confidence, self-efficacy, effort, and progress. They were constantly internalising and interpreting the information coming to them from a wide range of school and teacher judgements in order to calibrate the effectiveness of their metacognitive strategies, gauge the appropriateness of their self-regulation and improve their performance. Setting and comparisons with peers brought them close to the achievement goals or performance goals that Dweck advises can be self-limiting, but these children used the information as part of a wider set of data about themselves as learners, using set place maintenance as an indication that their metacognitive and self-regulatory strategies were working. These children were able to describe occasions when teachers had given them helpful feedback, for example the geography star with its non-linear tracking of progress over time or the assessment regimes in mathematics, English and

RPE where teachers fed forward, explaining the next steps, at the same time as commenting on current performance. Several of these children had benefitted from parental support in response to feedback too. Andy's mother had "brokered" a conversation with teachers when Andy was struggling to understand how to improve, Beth's mother had repeatedly advised Beth to speak to teachers when she wanted to know how to make progress following an assessment and Vicky's parents had made sure she understood that when she received positive feedback, she related it back to her own efforts and strategies.

However, Ellie, Oscar, Alex, and Lennie were less able to respond positively to feedback, often becoming dismayed at the information coming back to them through assessment and searching for external causes or displacements rather than solutions. Ellie displayed high levels of emotion and distress, Alex and Lennie looked for models of successful learning beyond school and Oscar became increasingly disappointed with his inability to achieve his potential but struggled to self-regulate throughout his GCSE years.

There was a correlation in this group of participants between having well developed metacognitive strategies, sufficient self-regulation capacity to sustain independent study or practice over time and using feedback to "feed up, feedback and feed forward" (Hattie & Timperley, 2007). There was also a correlation in this group between having rudimentary metacognitive strategies, struggling with self-regulation and negative responses to feedback. This

252

deeper understanding of the role played by feedback in the learning process goes beyond the Assessment for Learning's distinctions between formative and summative assessment with its emphasis on teacher responsiveness to student misconceptions (Wiliam, 1998) and highlights the profound nature of effective feedback operating beyond task and process at the self-regulation level. (Hattie & Timperley, 2007).

5.3.6 "Learning literacy" and the black box mechanisms

Finally, for the "moving parts" inside the learning black box to function successfully, the participants needed high levels of "learning literacy". This particular understanding of learning occupied a place of intersection between home and school and between identity and learning. When parents offered high levels of autonomy support, participants' intrinsic motivation and sense of agency increased. If parents also were able to articulate a model of learning comprising effective metacognitive strategies, then their children were even more able to deal with setbacks and achieve academic growth. With good autonomy support, increased intrinsic motivation and an understanding of the strategies within effective metacognitive sequencing, the participants were more likely to be able to self-regulate thanks to their enjoyment and sense of agency. They were also able to use feedback effectively although the feedback itself did vary in quality. With good "learning literacy", participants achieved autonomous, agentic, and balanced learner identities that led to academic growth. When "learning literacy" was less secure then participants' learner identities were at risk of becoming diffuse. Participants in this category

were less likely to be agentic and more likely to default to externalising the reasons for setbacks or to displaying helpless patterns in the face of difficulty.

5.4 To what extent are there more complexities involved in the translation of Implicit Theories of Intelligence into outcomes? e.g., the social and reciprocal nature of education, or the role of communities, families, and parents?

For children in England, learning at school is a dominant, shared experience during which they receive feedback and judgements about themselves and their learning. Their families, communities and outside interests are unique to them but having to be educated in the English school system is a significant part of their lives about which they had no choice, but which affords a powerful set of experiences that tell them about how well they measure up to an externally determined set of social and academic expectations. The lived experience of school engages learners in a process of constant calibration. This calibration contributes significantly to the global self-concept that tells learners what kind of a person they are and what kind of a person they can become.

In this study we can see how children pieced together the information they were gleaning from their lived experience of school to create learner identities for themselves. The various aspects of learning they felt they could or could not achieve in were woven into their sense of themselves. By focussing on their learner identities this study looked at the connection between identity

254

and learner self-concepts in a new way. The findings from the data suggest a complex interaction between mindset, identity and learning mechanisms that have placed a much stronger emphasis on the concept of learner identities.

5.4.1 The impact of primary experience on learner identity

The impacts on learner identities of various aspects of educational practice have been the subject of several studies. This interest gathered pace with the introduction of high stakes testing in primary schools amidst concerns that grade labels were undermining children's identity work. Children were struggling to create and sustain their sense of themselves under these new conditions created by the level of surveillance within the assessment process. After two decades the grading of primary school pupils is still happening in spite of early warnings from Reay and Wiliam (Reay & Wiliam, 1999) that, despite the assumptions that children are unaffected by the assessments and are passive participants in a process where the main focus is teachers and institutions, "children are simultaneously active in the assessment process and profoundly affected by it" (Reay & Wiliam, 1999). A decade later, Booher-Jennings looked at what was happening to learner identities in primary schools and concluded that, "The social categories of "passers" and "failers", made available through high-stakes tests, constituted new identities, and shaped and reconstructed students' own relationships" (Booher-Jennings, 2008). In 2021 Bradbury et al looked at the practices of division happening in primary schools and asserted that "This binary between success and failure,

passing or failing, is a brutal division of children at the age of 11" (Bradbury et al, 2021).

Participants certainly had strong competency beliefs derived from their primary experience which often presented as the English/ mathematics binary discussed by Marsh (Marsh et al, 1991). Mary started that she wasn't good at English and better at mathematics, Ellie that she was good at English whilst her brother was good at mathematics and Keith said he was good at SPaG but not at writing. Alex and Lennie were aware that they needed Learning Support at primary school and had low competency beliefs around their learning which continued during their secondary experience. Both children felt that they had high unmet learning support needs that defined them in secondary school and remained impervious to assessment suggesting that they had higher competence levels.

5.4.2 The role of family narratives in learner identity formation

Participants also constructed the self that they presented in school – "Who am I?" – by drawing on narratives held within their families. The role of parents in developing the competency beliefs in children has been studied since the 1950s and there is extensive research providing evidence for, "an association between parents' perceptions of children's competence and children's own perceptions of their competence" (Pomerantz et al, 2007, p.265). A variety of studies have linked parental perceptions of children's competence to children's actual achievement. Pomerantz et al's review of the research found

it "noteworthy that children's perceptions of competence are predicted more strongly by parents' perceptions than by teachers' perceptions" (Pomerantz et al, 2007, p.265). There is a need to look at the impact of high stakes testing in primary schools on parents' perceptions of children's competence if we are to further understand the role played by parents in the development of their children's learner identities. There was certainly evidence in the analysis of this cohort's experience to suggest that a combination of primary assessment and parental perceptions were impacting on learner identity.

In their curriculum interviews participants relayed the things their families said about them as learners. For example, Ellie explained that her family said she was good at English and her brother was good at mathematics, Oscar's mother believed that his natural intelligence would allow him a last-minute sprint to the finishing line as he was "saving it all for the exams", and Mary explained that her father had invested in her mathematics skills so that she felt confident. The role of the family in learner identity formation appeared to go further than the scope of studies into parental support for learning, however. The children reflected on their place in the family, in relation to parents, grandparents, siblings and sometimes the wider family. Interests shared with the family became their interests. Aspects of the curriculum that mattered to the family mattered to them. Their ability self-concept also came from a sense of inherited talent: they were more likely to say they were good at subjects that family members were good at. Andy ascribed his success in design technology to his grandma's crafting ability and his father's trade as a joiner. Vicky's sense of competence in science came from her mother's

scientific background. Lennie's confidence around materials engineering was linked to his uncle's success as a maker. Participants were influenced by the narrative their families held about them. If their parents said their child was good at something then their child felt that they were, whereas if parents said their child struggled with a subject, then this was the self-narrative participants tended to internalise. This resonated with Pomerantz et al's question about the strength of parental perceptions (Pomerantz et al, 2007, p.265).

Additionally, some participants were aware of their family's place in a wider, rural community, especially if they were involved in farming. Identity as part of a deep sense of heritage and connection with the land was dominant for children like Alex, Lennie, Ellie, and Andy. In our post-modern society, with its higher degrees of individualisation in the face of social and cultural uncertainty, these children from rural communities experienced an unusually strong sense that they belonged to a distinct social and cultural group. Studies have investigated the social-contextual impact on interactions between parents and children. For example, researchers in the US have looked at the cultural differences between Asian and European American families and suggested that children from Asian cultures may often take on their parents' goals as their own (Pomerantz et al, 2007, p.271). Studies in the UK have tended to focus on urban cultures but this study, undertaken in a rural secondary school, afforded some insight into the influence of rural communities and families on learner identity. Further research is needed on cultural influences on children from agricultural communities in the UK.

Family narratives around the participants and around learning played an important part in the formation of learner identities. Families based their knowledge of these adolescent participants on their experiences of them as learners from an early age and had stories to tell about this. These narratives set what was happening in adolescence into a context. These were powerful stories for the participants that formed a base layer of self-knowledge on which subsequent learner identity formation was built. In some cases, these narratives were based on inheritance stories. Ellie's emotional distress before examinations were presaged by her mother's anxieties whilst Andy and Alex attribute practical skills to their grandparents' genetic legacy.

5.4.3 The relationship between family narratives and schooling

A combination of good at/ not good at self-concepts, which started as family narratives and early education experiences formed a unique profile within each learner's identity. This profile was then acted on by multiple experiences during secondary school: setting, assessments, observations, teacher comments to name but some. For most participants, this myriad of tiny judgements tended to confirm the good at/not good at profile so that it influenced effort, aspiration, and curriculum choice - and of course learner identity.

Beyond this, families could contribute positively to learner identity formation. Vicky's parents were able to provide her with sufficient cultural capital and their own experience of learning so that she could thrive in the school

environment. Beth's and Andy's parents were able to guide them through setbacks by acknowledging their emotional response but offering practical strategies to work through difficulties. Other parents were struggling with other issues. Lennie's mother was never able to come into school so that Lennie negotiated with school on his own terms. Kai's mother was struggling with his ADHD and his behaviour eventually as he spiralled into criminality outside school. Her priorities changed completely to just keeping him safe.

Support for learning from families is a complex issue. It is often represented as an issue of disadvantage with studies citing low socio-economic status as a reason for lack of cultural capital, aspiration, and support. Ofsted's new framework for school inspections asserts that the learning gap caused by disadvantage is caused in part by a deficit in "cultural capital". Children from affluent, middle-class families tend to experience more in terms of travel, the arts and culture, reading and vocabulary. Schools are tasked with doing what they can to close this gap.

It was certainly evident in the data from this cohort that the students had had very different experiences, ranging from Alex, whose entire focus was on the farm and who would only read farming publications, to Vicky whose family holidays were taken in Spain and Italy and whose grandparents owned a house in Spain. She remembered a trip to Oslo where she was interested in an architectural project, she played tennis every summer with her mother, she talked at length about science to her mother and god mother, she enjoyed

cooking with her dad, and she had a "whole wall of books" in her bedroom. She was reading a book about the periodic table at the time of her interview. Alex and Vicky were indeed on very different journeys, influenced to a great extent by their families' interests and priorities. They represent the two extremes found within this cohort. Other participants were encouraged to take part in sports by their families. Some had had the opportunity to learn a musical instrument. Ellie and Keith both engaged with History because a parent enjoyed it. However, of all the children who participated in this study, it is Vicky whose opportunities to acquire wider learning through her family's agency stood out. She had professional, affluent parents who had had graduate educations. The wider learning Vicky was able to access prepared her well for the GCSE curriculum, particularly the English Baccalaureate with its emphasis on languages and science.

In this study, the participants were disadvantaged when their parents were distant from their learning and from their identity formation and when they were unclear about the learning process itself. Whilst this was often related to the parents' own experience of learning, it was not always correlated with economic disadvantage or the ability to transfer cultural capital.

The abilities of families to support learning at home came to the foreground during the Covid-19 school closures when significant numbers of parents found it very difficult to home school. We have an assessment system that favours the Vickies and Beths with their home support systems and significantly disadvantages children like Lennie, Kai, Ellie, and Oscar who, for

a variety of reasons and in a variety of ways, did not have the same finely calibrated level of support for learning at home. This was not always associated with economic disadvantage in these cases, quite the opposite in some. The most successful students not only had powerful Implicit Models of Learning with clearly articulated metacognitive processes at the heart of them, but they also had parents who shared and promoted that type of model. This was not associated in all cases with the parents' own educational backgrounds.

5.4.4 Learner identities interact with the curriculum

Participants brought their narratives, arising from family and community group membership, into school. Experiences in school then added to the children's individual identity formation as they internalised meaning derived from those experiences.

Participants added to their learner identity a nuanced idea of their skills and talents across a wide curriculum range. They were clear about what they were good at and what they struggled with. This curriculum-based paradigm became part of their learner identity and in most cases became quite fixed during the time of the study. For many participants, there was a family connection whereby a learner identified as good at something if a family member, usually a parent, was perceived to be good at the same subject or skill. Being good at something led to increased confidence, higher resilience, and motivation so that the curriculum element became a strong aspect of

learner identity. Keith's competency beliefs in mathematics and science meant that he was confident enough to adapt his learning strategies and make links between subjects. Mary's confidence in mathematics and science carried into the classroom so that she could respond well to feedback and assessment. Vicky's perception that she was good at English meant that she was pleased to get helpful feedback and develop mastery skills.

Conversely, identifying as struggling with a subject or curriculum area led to problematic facets of identity formation resulting in negative emotions. Nowhere was this more starkly observed than in the case of Alex and his refusal to read fiction. Lennie was also angry about his mathematics; Oscar was frustrated at his own reluctance to plan or practise, and Oona admitted that when she felt that she could not do something she did not work. Keith and Mary with their high scores for growth mindset were able to resist the tendency for learning setbacks to become part of their learner identity but those like Kai and Lennie with scores suggesting fixed-entity thinking were more likely to internalise a sense of failure and to identify permanently as "no good" at something.

Children who were good at so-called "academic" subjects, those that make up the English Baccalaureate, tended to be unconcerned if they were struggling in practical or creative subjects. Experiencing difficulty in these areas did not impact too negatively on their identity, other than for them to define as not practical. Here there is undoubtedly a cultural valency at play, because these subjects do not have the same status within the education system or wider

culture as the E-Bacc suite, then identifying as not practically able is not usually associated with negative self-esteem. Children whose practical abilities outshone their perceived "academic" prowess used those abilities to add significantly to their learner identities and used their family and local community's norms to add the status afforded by social grouping to that aspect of their learner selves. This tended to strengthen that aspect of their learner identity and lead to higher levels of disidentification with the wider cultural values that set such store by academic success.

The participants used a range of information sources in order to determine that they were good at/ not good at an aspect of their learning. They built on prior experiences at primary school, transition, and early secondary school, adding these self-concepts to the narratives they shared with their families about themselves.

This study's participants varied in terms of their connectedness and sense that school culture fit with their family and social group. At one extreme, Vicky's family and social group afforded her high levels of cultural capital so that school culture was not at all alien to her, whilst at the other extreme, Alex said school was something to be endured before joining the "real world" of the farm. As Bourdieu said,

> The habitus acquired in the family is at the basis of the structuring of
> school experiences; the habitus transformed by the action of the
> school, itself diversified, is in turn at the basis of all subsequent

experiences, and so on, from restructuring to restructuring. (Bourdieu, 1972, cited in Bourdieu & Wacquant, 1992, p.134)

It is certainly true to say that, in the case of the participants in this study, those whose family and social group were more aligned with school's cultural norms felt that they belonged in school and that they could engage with its practices, whilst those, like Alex and Lennie, whose family and community afforded an alternative capital - in their case an "employability capital" - were confident in rejecting school's cultural norms and practices. This positioning in relation to school's culture and values was integral to learner identity. However, even when students like Vicky, and indeed Oscar, arrived with high levels of cultural capital, they were faced with other challenges with their learning whilst Alex and Lennie did find ways to engage with school to provide them with what they needed for their futures.

5.4.5 Parental support for learning – evidence from parents in academic reviews.

Information about the nature of parental support for learning was gleaned from two sources: what the children said in their curriculum interviews and the contributions made by parents in academic reviews. Academic reviews can be pressured experienced for parents. Some parents have had difficult experiences in their own schooling and find interactions with authority figures in school stressful, others may feel an ego involvement in the performance of their children, others may be experiencing external pressures that have

impacted on their parenting. Even the most secure parent would probably feel anxious about having a conversation about their child's progress with a senior member of staff in school. It was important for me not only to try to put these parents at ease during reviews but also to triangulate their contributions against their children's accounts to provide a measure of validity when analysing the nature of parental support.

Several parents and participants mentioned the significance of the transition from primary to secondary school during interviews and reviews. For some parents, like Oona's mother and Alex's mother, the change from primary to secondary school represented a decline in literacy that concerned them, but which left them feeling rather powerless. Other parents like Vicky's or Beth's were able to provide guidance and support for their children as they adjusted to the differences presented by secondary school. There have been several studies of the connection between parenting styles and attainment with a widely held view that authoritative parenting styles that foster a sense of agency in children are the most desirable (Pomerantz et al, 2007). For example, Ratelle et al isolated the efficacy of parental involvement and autonomy support at transition in US schools (Ratelle et al, 2004). They concluded that self-determination stabilised, and intrinsic motivation increased after transition when parents provided the appropriate resources to support the development of active, volitional and agentic children. This study extends that understanding of parental autonomy support beyond transition to suggest that it remains a crucial determiner of learner identity throughout education.

5..4.6 The importance of learning literacy

Whilst the case has been made already for authoritative parenting styles resulting in autonomy support for children's sense of identity and self-efficacy, there are still ongoing challenges and setbacks for children during their school experience that make demands on parents that go beyond their parenting style. The daily parental support for the development of "learning literacy" was a crucial protection for children throughout their learning at school. This was one of the key findings of this study and was central to determining the success of the participants' learning at secondary school. Parents like Beth's, Vicky's, Andy's, or Mary's mothers continued to provide guidance and support throughout their children's secondary school years, articulating strategies with high levels of metacognitive and self-regulatory features in response to setbacks or difficulties.

I coined the expression "learning literacy" to describe a combination of resources that give children what they need not only to withstand negative experiences in education but also to achieve academic growth. These resources include coaching-style emotional support (as opposed to emotional amplification which is damaging), strategies to solve problems, including how to ask for support from teachers, an understanding of the importance of "good enough" effort and good study habits balanced by the need for wellbeing and, in the most successful cases, a shared model of the learning process that includes deliberate practice, self-monitoring and a breadth of solution choices when facing difficulty.

Learning literacy builds on several decades of interest in making metacognitive processes overt through "learning to learn" initiatives, which have had varying degrees of success when implemented. In the 1970s, Flavell built on classical mnemonic systems to arrive at a definition of metacognition: thinking about thinking (Flavell, 1979). This was then developed into a taxonomy of learning strategies by Weinstein and Mayer (1986). A model of strategic learning was developed by Weinstein in 2006 (Weinstein et al, 2015) in which learners' skills, motivation and self-regulation strategies interact. Weinstein is, however, at pains to point out that interventions to develop students' learning to learn skills have been trialled with college students and that there are difficulties teaching these strategies to younger students because of "the developmental progression in thinking that takes place as children age".

The European Parliament defined learning to learn as a key competence for lifelong learning describing it as,

> The ability to pursue and persist in learning, to organise one's own learning, including through effective management of time and information, both individually and in groups. This competence includes awareness of one's learning process and needs, identifying available opportunities, and the ability to overcome obstacles in order to learn successfully. (Key competence Network in School Education, 2006, http://keyconet.eun.org/learning-to-learn)

In the first decade of the twenty-first century, schools in the United Kingdom started to introduce learning to learn programmes, either through their

268

Personal Development Programmes or through discrete taught courses on the timetable. These were developed more formally by the Department for Education into Personal, Learning and Thinking Skills (Department for Education , 2007). Schools expended considerable time and resource attempting to incorporate these into their curricula, only to have the initiative disappear with the revised National Curriculum in 2013-14 (Department for Education , 2013), due to the increasing understanding that learning to learn needed to be incorporated into subject disciplines.

Similarly, there was a movement to "personalise" learning, a concept which found its way into public sector policy in the 2005 White Paper. (Campbell et al, 2007). Taken from a 2003 Demos think tank paper by Leadbeater, which proposes that students set their own learning targets, adopt continuous self-assessment for learning and that flexibility be introduced into the curriculum with students able to make informed choices about their pathways, the White Paper conceptualised personalisation as,

> A tailored education for every child and young person that gives them strength in the basics, stretches their aspirations, and build their life chances. (DfES, 2005, p.50)

Campbell et al point out that successive reviews and attempts to transfer the concept of personalisation into practice through policy meant that Leadbeater's radical proposal, intended to change power relations over knowledge production, were lost (Campbell et al, 2007, p.145). A powerful counter argument against personalisation in education, acknowledged by Leadbeater, was the potential of personalisation to widen inequalities by

privileging professional-class parents whose cultural, intellectual and financial capital would enable them to exploit the advantages of personalisation for their own children (Campbell et al, 2007, p.139). A change of government brought a change of policy direction moving us towards the centralised approach we have today.

The interest in metacognition and learning to learn strategies did not wane, however, as educators increasingly saw their value in supporting learners. The Education Endowment Foundation's guidance report on Metacognition and Self-Regulation "warns that metacognitive strategies should be taught in conjunction with specific subject content as pupils find it hard to transfer these generic tips to specific tasks" (Education Endowment Foundation, 2017 p.24). This is understood within the revised Ofsted Inspection Framework (Ofsted, 2019) which asks for curriculum building based on the inter-relatedness of knowledge, understanding and skills. More recently, this understanding forms an important "golden thread" in the revised professional development frameworks developed by the Department for Education. For example, the Core Content Framework underpinning the Initial Teacher Training curriculum explains that,

> Explicitly teaching pupils metacognitive strategies linked to subject knowledge, including how to plan, monitor and evaluate, supports independence and academic success (Department for Education, 2019, p.17).

For the first time, teachers in English schools have a "blueprint" for learning, based on cognitive science with an established evidence base. Whilst this

270

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needs to be reviewed and refined, it is nevertheless an opportunity to use shared models and language to describe the learning process within the classroom.

5.4.7 Parental support for learning literacy

Beth, Vicky, Keith, and Andy all had varying degrees of "learning literacy" afforded them by their families and they all achieved academic growth in spite of their differing Implicit Theories of Intelligence. Ellie and Oscar's parents struggled to articulate a model of learning for their children and tended to reflect their children's emotional responses to challenge rather than afford them autonomy support. Without adequate "learning literacy", they did not manage to achieve outcomes remotely near to their potential and struggled with the transition to post-16 education. Again, this was in spite of scoring in the growth range for their baseline Implicit Theories of Intelligence.

The parents said little to suggest their own Implicit Theories of Intelligence, aside from Beth's mother describing an incremental approach about learning "from how you got it wrong" and Kai's mother telling him that he was "clever, so bright" in line with what appears to be a belief that intelligence is something he had been born with. Several of them did reveal more when they attributed academic achievement to effort as Vicky' mother does: "certainly, the hard work is paying off".

The opposite effect did not appear in the data. No parent made the connection between low grades given for effort and lack of progress. In fact, these discussions tended to be rather more problematic. Kai's mother had clearly struggled to get him to see the significance of the effort grades, Ellie's mother had accepted her daughter's explanation for low effort grades, "because the subject matter is harder because of the new exams" and Oscar's mother struggles to understand why his effort grades are low at all, wondering if he was "keeping it all for the finals". There was an information deficit in evidence. Parents needed support from the reviewer to interpret the data, understandably, but then some of them were struggling to understand what effort grades were telling them about their child's work rate. Parents whose children had good outcomes in terms of test results were delighted to be able to attribute their child's achievements to effort in the review. None of them attributed good results to innate intelligence.

Parents were less comfortable with conversations about low levels of effort being reported by teachers. This could be due to the circumstances of the academic reviews leading to this discomfort on the part of parents when discussing their child's low effort grades. The reviewer was in a position of power, representing the views of teachers who are making judgements about their children's attitude to study, which parents could interpret as a judgement about their parenting as it veers into the territory of what happens in the home.

More profoundly though, in the case of children like Ellie, Alex, Oscar and Kai, who were struggling the most to engage with schoolwork and sustain effort, there was a deficit around understanding the learning process. Most parents were trying to understand the scaffolding, structures and methods needed by their child as they were learning. Some were more successful with this than others. Three parents referred to the now discredited idea that children were either visual, auditory, or kinaesthetic learners – the VAK theory - that was trending in schools probably when these children were in primary school. Alex's mother attributed the difficulties she had with him to his being a "visual learner": "you can tell him until you are blue in the face but if he doesn't see it, it doesn't work". Mary's mother, who was a primary school teacher thought Mary's problems with literacy were because she was as "auditory learner". Ellie's mother in particular felt that school's failure to test and diagnose Ellie's learning style was a problem. She mentioned it in both the year 9 and year 10 academic reviews: "is there any chance that Ellie could have the test?". She described Ellie as "very conscientious" but then bemoaned how distracted she was by her phone, that she tended to ignore subjects she was not interested in when she revised and that she needed to start revising earlier. The parents had relayed some crucial information about why Ellie was not making as much progress as she could but were still looking for an understanding of the barriers Ellie was experiencing. When this opaqueness around Ellie's learning was added to a difficulty gauging effort for these parents the results were quite significant for Ellie whose tendency to react emotionally when challenged about her learning meant that her parents rarely addressed it and led to much contact with school about Ellie's poor emotional state. She did not

do well in her GCSEs and unfortunately, she did not transition successfully to her college post-16.

Ellie's parents were not the only ones wrestling with their understanding of what was going on with their adolescent child and their learning. Beth's mother sounded a note of exasperation and concern around Beth's high stress levels, "we need you not to get stressed all the time", but she admitted that she did not know why Beth was like this. Kai's mother said he was "clever" but that he did no homework and no revision. She felt that he had so much to offer, citing a range of different ways he had demonstrated attributes, but she reported that he was "a real pain" and would refuse to do homework. Oona's mother was a little frustrated that her daughter was disorganised explaining that she brought all her books to school every day rather than plan ahead. She said that she expected her primary school class to be more organised and expressed a hope that Oona's chosen career path, the army, meant that "they will knock it into you, if I can't".

It is worth considering the role of mothers in supporting children's learning. In terms of this cohort, only two fathers attended academic reviews. This could be because the reviews happened during the working day, although most mothers worked too. Three of the children were being brought up by single mothers and had complexities around the role their father played in supporting them, usually because of second families or distance. The children's curriculum interviews tended to suggest, however, that even when fathers were part of their lives, most support and involvement with schoolwork

274

emanated from their mothers. There are several studies into the role of parents in fulfilling children's psychological needs for feelings of competence, autonomy, attachment, and activity value (Pomerantz et al, 2007, p.260). There are unanswered questions about the difference between the impact fathers' and mothers' value of academic success on boys and girls but indication that mothers' emotional support is important. Children with secure attachments to mothers during primary school are more likely to have advanced cognitive skills and higher attainment through to adolescence (Pomerantz et al, 2007, p.267). There are, however, other important roles played by parents in supporting education beyond the affective and this study has highlighted the importance of parents providing structure for learning together with an emphasis on process.

When the parents were reporting difficulty with school it tended to be by whole subject. Several of them spoke of "struggling with" or "having a wobble in" a specific subject but did not elaborate. The problem was the subject itself rather than a learning challenge embedded within it which suggested that breaking a learning activity down into components or providing scaffolding was a particular difficulty. Some parents were comfortable talking about literacy, however, drawing on primary school and transition experiences to give supporting context. Alex's mother had noticed a deterioration in his handwriting since his starting at secondary school and remarked that he was having to rush written pieces more with the pressure of the timetable. Mary's mother reported struggles with phonics and spelling since primary school. Oona's mother had actually contacted school about her concerns with Oona's

"presentation, her spelling, her grammar, everything". It could be that parents feel more confident and able to talk about issues like handwriting and spelling rather than discuss subject disciplines with secondary specialists. It could also be that handwriting, and spelling, are more visible and overt signs of progress: much of learning is invisible so that parents of adolescents are struggling to see and understand their learning.

Parents were more able to discuss the emotional impact of learning and their support for their children's well-being. Ellie's parents were concerned when she became tearful when her effort grades were discussed. Oscar's mother was worried that he would be upset by low grades. Beth's mother repeated the need for her to have self-belief, as did Kai's mother. Two sets of parents had negotiated a supportive process to deal with their children's worries. Vicky's parents had come up with a strategy for her to deal with her lack of confidence, namely, to do her best in the examinations and see how she felt after that. Andy's mother supported him to deal with the idea that his teacher did not like him by adopting a more mature understanding of what was going on and engineering a fresh start with the teacher. Both of these emotional support strategies had acknowledged the child's feelings of anxiety but then "walked" the child through a solution so that they could overcome the issue and make progress.

5.4.8 Parents' views about the curriculum

Option choice was a key topic for the year 9 reviews, and this gave rise to discussions about the relative values of subjects. Parents who commented on the range of choice tended to worry about the perceived value of the arts or vocational/ technical subjects. Beth's mum used the word "educational" to describe GCSEs in comparison to BTECs and Technical Awards, Alex's mother wanted him to do something "a little bit academic as well as the other". Oscar's mother was "dubious" about him doing drama and art.

However, parents were also not supportive of the reforms to GCSEs that meant that their children were facing harder content, linear examinations, a new grading system going up to 9 (beyond the A*) and a reduction in coursework. Oona's mother put it quite forcefully: "I have friends whose children are in bits at the moment. It is just awful". There was therefore a tension between not valuing courses that had more continuous assessment and regretting the move to increase the difficulty of GCSEs for all students.

Academic reviews revealed that there was a gap between parents' understanding of what their children needed to do to be able to succeed and the information they were able to access. Parents were trying to decipher effort grades, predicted and target grades, DfE progress expectations, and teacher comments in order to discover how successfully their children were learning and what they could do to help. The new examination regime with its emphasis on memorisation and literacy skills was unfamiliar to them. During

277

their adolescence, some of these children had learned to widen that parental knowledge gap with misinformation or behavioural patterns. Without a confident grasp of what data was telling them, what their children were actually doing, and what success in this new regime looked like, some parents were searching for answers. Without a clearly articulated model of learning, shared by pupils, teachers and parents, unproven models - particularly the learning style or VAK (Visual, Auditory, Kinaesthetic) model - or wellbeing concerns filled the vacuum. The learning styles model took hold in schools a decade ago and was predicated on the notion that children accessed learning concepts through different senses. There was no strong evidence base for this claim and it has since been discredited but it was an accessible idea for teachers, parents and students and can still be found in school-based materials on pedagogy. Its rapid adoption by the profession is one of the factors motivating a call for better use of evidence-informed pedagogy in schools.

Parents who were able to negotiate the territory and who were confident about talking to school were able to support the development of resilient and effortful responses. Several parents made powerful attributions of success to effort and perseverance. Parents like Beth's, Andy's and Vicky's were close to the learning process and understood their child and the learning demands being made of them, regularly using mastery-oriented advice for example seeking support, starting revision early, attempting the difficult tasks first, managing negative emotions or testing yourself.

Other parents like Ellie's, Oscar's and Alex's were less involved and less aware. Without a clear model of the learning process and some grasp of their child's learner identity, it was very difficult for these otherwise well-meaning and supportive parents to support their children through their particular setbacks.

5.4.9 Community influences

Some implicit models of learning centred themselves on community vocational learning outside school where a different set of values prioritised experiential learning about agriculture or the world of work over learning in school. Three of the participants came from farming families and had generational ties with the local rural community. These children in particular saw their school experiences of learning in this much wider context and this had an impact on how they saw themselves and their futures. Andy came from a farming family with ties to long standing local family businesses. His interview had the most extensive references to family members. Alex had been born and brought up on a farm that had been in his family for generations. His later interviews demonstrate the extent of the influence on him in terms of a learner identity but in this early year 9 interview he expressed strong views about the school's need to take account of his farming responsibilities: "I find it hard because we're always farming and on a Wednesday night it's auction and I find it hard to get my homework done on time". Lennie referred to farming, and also to gamekeeping and a wider

network of family businesspeople and local employers with whom he identified far more strongly than the people he encountered in school.

The school serves a large rural community with strong local traditions and connections to the land. The value placed on farming and its associated trades is extremely high and, as I discovered in the individual case studies of Alex and Lennie, the ability to identify with a strong community unconnected with school was a significant part of their learner identities.

5.5 The one-shot interventions around mindsets create marginal impacts that are difficult to sustain: what CAN schools do to improve the learning experience and outcomes for children?

5.5.1 Understanding the nature of setbacks for learners.

Whilst most participants could recount instances of cognitive challenge, whereby they had struggled to understand something they were being taught, the range of challenges they faced when learning was broader than that. Some participants were frustrated by a perceived lack of skill in practical or creative subjects, for example struggling to use tools or to draw accurately. Some were aware that their family and prior experiences had not afforded them the same advantage as peers, for example through learning music, experiencing religion, or being able to speak a language. They were less concerned about setbacks they attributed to a lack of skill or prior experience.

Most participants found memorisation and the development of high order literacy skills the most challenging aspect of their learning. These skills played a significant part in most of their curriculum and also in most of their assessments. They pre-occupied most participants and contributed significantly to their learner identities and learner models.

In terms of experiencing failure, this was recounted most often as a result of the assessment and setting systems.

Setting carried important weight for several of these participants, causing anxiety in some cases. It was one of the most powerful indicators to them of their academic status in comparison to others in their year group such that the possibility of being placed in a lower set was a real concern. This was connected to examination grades, with participants assuming that a poor examination performance would lead to a set demotion. This was unlikely to be the case but without clarity from school about the setting process it was an inevitable misconception. Comparatively low marks in classroom tests or exercises also featured as setbacks for some participants but this was not a common theme in the data. School practitioners know that setting is a very inexact and flawed process done for the convenience of teachers more than anything else, not least the need to create groups that can be assisted by Learning Support Assistants – that very finite resource. Children, however, viewed their setting as reliable sources of information about themselves, adding the dimension of comparisons with peers to confirm or question that information. Like a poor examination grade, being put in a lower set or feeling that they are in a set where they don't belong because everyone seems

cleverer than them were setbacks that children needed to manage. I am not sure that schools are quite so aware that their systems and structures are creating setbacks for their pupils that have the potential to impact negatively on their learner identities.

When a child said, "I'm in set one for maths and set two for English" they were communicating a strong element of their learner identity. Setting information told them about their ability as indicated to them by their teachers and also in comparison to their peers. Of course, the comparisons they made with peers were only school wide. None of the participants referred to their Key Stage 2 Standard Assessment Test scores or their Cognitive Ability Test (CAT) scores, both of which data sets indicate a pupil's prior attainment of ability in comparison to national cohorts. Their school used this national validated data to measure progress and did not tend to place emphasis on an individual's scores although they did appear regularly on school reports. It did not seem to have registered as an information source with which to construct a learner identity to participants in this cohort, however.

There is a concern that ability setting is undermining of social justice and that segregation of learners is likely to produce inequalities based on gender, class and race (Archer et al, 2018). At the time the participants in this study were in Key Stage 3, the gender and class differences were quite visible in the school with English top sets being predominantly female whilst boys brought up on farms made up the majority of the bottom sets. Boys tended to dominate in mathematics top sets but not to the same extent. These issues

were not mentioned by participants with above average prior attainment, who accepted the status quo about setting and used it as a reliable source of information about their progress. The children with lower prior attainment did not mention setting at all.

Participants used test scores, assessments, feedback from teachers and examination results to add to their understanding of being good at/ not good at aspects of learning. This is unsurprising of course, as is the tendency of participants to compare their scores with their peers. Comparisons with peers were based on more than setting and assessment information, however. Most participants could identify peers who were better than them in a curriculum area, whether that was because in computing they were just "clicking away" or whether in mathematics they just seemed to solve problems more quickly than them.

School-based failures around setting and testing tended to provoke the most emotional responses to setbacks, almost entirely with female participants. They did tend to produce effortful responses, however, regardless of the participants' Implicit Theories of Intelligence. In virtually all cases the participants worked harder and sought support. The most successful outcomes were those accompanied by strategic advice and emotional support from parents.

Dweck writes about being resilient to setback in relation to implicit theories. The ability of learners with growth mindsets to see failure as useful is a strong

theme in mindset studies (Dweck, 1999, Dweck, 2006, Dweck, 2012). Her work has given rise to a plethora of studies examining the relationship between learners' implicit theories of intelligence and academic achievement. Some have trialled interventions to teach learners about brain growth (Yeager et al, 2019, Claro et al, 2016, EEF, 2015) with some short-term impact. Some have looked at the connection between disadvantage, implicit theories, and academic outcomes (Aronson & Fried, 2002, Baird et al, 2009, Claro et al, 2016). These large quantitative studies certainly point to a real connection between Implicit Theories of Intelligence and academic progress, but they do not explore in granular detail the types of setbacks that students are really experiencing in school beyond these broad themes. The majority of studies assumed that level of difficulty and challenge was the main setback requiring resilience from learners. The children in this cohort described a range of difficulties and disappointments that were having a real impact on their lived experience of school and on their learner identities, but whilst there was certainly reference to cognitive challenge in the data, far more data related to the demands of the curriculum and, significantly, the national assessment system. The children were on a journey towards a linear examination season at the end of their year 11 in which they would sit on average 26 separate papers in a 3-week period. A reduction in coursework and the removal of modular examinations meant that their examination performance would determine their grades. Subjects had had more difficult content included in them to allow for the exceptionally able to attain the new grade 9: a grade 7, the equivalent of a grade A was viewed as underachievement by many students. The traditional "pass" benchmark of a C grade was now divided into

a grade 4, standard pass and grade 5, strong pass with most A level providers asking for 5s rather than 4s. Attaining below a 4 in English and mathematics was a failure and students would be required to re-sit repeatedly during their post-16 education until they had passed these subjects.

5.5.2 Learner responses to setbacks

When most participants encountered cognitive challenge, they felt able to seek support from their teacher or their peers within lessons. Children with fixed-entity mindsets like Oona and Kai tended to withhold effort, for example Oona struggled to understand Physics and knew she could improve with effort but didn't apply herself: "I'm sure I could do it if I try but I don't really enjoy it". Beth's fixed-entity mindset didn't stop her from seeking support, asking teachers, going back at lunch time to clinics, seeking explanations that helped her to understand. Most participants accepted that cognitive challenge was part of school and took it in their stride, confident that teachers would help them to understand. Andy explained that the only problem was when he still didn't understand his teacher's explanation after he'd asked for help: "first I ask my friends but if they don't know I ask the teacher again, but I do find that they tell me". Most participants therefore responded to cognitive challenge by persevering and seeking support, confident in the knowledge that eventually they would "get it" if the subject were important to them.

Some children tended to "write off" subjects that were less important to them and that they were struggling with. This was to be expected during this stage

of year 9 when pupils were choosing their options for GCSE. It was interesting to see the subjects tending to fall into that category: RPE and music with their reliance on family and prior experience and the creative and technical subjects where children had a perceived lack of skill, and which had less value to them.

5.5.3 Memorisation and literacy

More of a challenge were the twin foundation skills of the curriculum and assessment regime: memorisation and literacy. These required a different approach. Neither are subject specific, yet each subject had its own requirements. Neither are explicitly taught but reliant on subject specialists to support their development. These two major aspects of learning were left for participants to master on their own, piecing together advice from subject specialists, peers, and family members. More successful children like Vicky and Beth had sufficient self-regulation and metacognitive awareness to practise effectively. Less successful children like Oscar, Alex and Kai were less inclined to practise and improve their literacy and memory skills which probably impacted more negatively on their outcomes than any other aspect of their learner identities.

It was perhaps surprising to discover that remembering was at least as challenging an aspect of learning at school as understanding for these participants. The emphasis on remembering information is a product of the assessment demands in school and has impacted curriculum and pedagogy

to such an extent that children mention it to a significant extent when they talk about challenges with learning. Some children engage with memorisation more successfully than others and this has led to a distortion in these participants' definition of successful learning. A different way of assessing these children could well lead to a different – and perhaps more inclusive – definition of success.

The extent to which struggling with memory was a setback or difficulty for these students was surprising, especially when compared to the relatively lower incidence of data around cognitive setbacks. Dweck makes little reference to memorisation as a key component of academic success, focussing instead on cognitive aspects of learning such as problem solving (Dweck, 1999). Yet memory was significant in these year 9 pupils' experience of education with the students themselves attributing it to the need to perform in formal assessments designed to prepare them for GCSE and beyond. It was therefore important to consider the extent to which national education policy created the context and influenced the curriculum within which these participants' learning is taking place.

Whilst Dweck's early studies focussed on problem solving for their experiments, there are several other proficiencies required of children in the English secondary school. Needing to memorise for tests and examinations needs discipline and some idea about effective technique but is not necessarily an intellectual challenge. It can be, but in the case of these participants' experiences it tended not to be. They talked of going "over and

over" something until they could recall it under pressure. In a later study Dweck posits that there are occasions when having a goal related to outcomes - a performance goal - can be a positive condition and cites the driving theory test (Haimovitz, 2017).

In realising the impact of the nature of the curriculum and also of high stakes testing in English schools in the early twentieth century, it was now important to ask whether a definition of learning as understanding and remembering (Ofsted, 2019) was distorting learning in schools to the extent that memorisation becomes such a key challenge for children. In other words, has high stakes testing created a set of performance goals that the whole institution is working towards? Schools, departments, and teachers are judged mainly by the outcomes their pupils achieve in their final examinations. By creating a system whereby the value of professionals' work is measured by the achievement of performance goals have we undermined our national ability to achieve academic growth in the interest of efficient measurement? Bibby asserts that there is a growing awareness of the undesirable impacts of objectives-driven teaching: "The technical-rationalist dream of a knowable, measurable, controllable approach to teaching and learning seems to be unravelling" (Bibby, 2009).

The last decade has seen significant change in the way that progress is measured in school. Now pupils at the age of 16 and 18 take high stakes linear examinations with increased and more challenging content compared to previous assessment regimes. The role of coursework and practical

288

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assessment has been reduced in the majority of subjects whilst modules, with the opportunity to re-sit and to "chunk" assessments over time, have disappeared. There has also been a prioritising of subjects with high literacy and memorisation demands and the devaluing and even removal of subjects with an emphasis on creative, technical, or vocational skills. When considering the ways that schools can support the development of incremental mindsets it is important to understand the context within which learners are developing their identities at school and national level. An important question for policy makers is whether the level of measurement and control in the national system has had an impact on the nature of learning taking place in schools. The key question for this study is the extent to which institutional performance goals – schools needing to do well in league tables because of pupils' examination results_- are informing the learning experiences of the participants. And significantly their sense of themselves as learners.

The interviews also revealed the extent to which reading and writing skills impacted on the lived experiences of children in school and thus on learning. Much has been written for practitioners about the importance of literacy as an underpinning or foundation skill in the curriculum and the disadvantage gap that opens up when children's skills do not keep pace (Quigley, 2019, Quigley, 2020). It was interesting that, like memory, literacy was something that required sustained practice and that cut across the whole curriculum for these learners. Literacy skills loomed large in the lives of these children and played a significant part in shaping their learning and the way they saw

themselves as learners. Whether they were challenged by handwriting, spelling, punctuation, vocabulary, extended writing or reading, their literacy issues coloured their experience and their self-concepts quite powerfully. The extent to which these self-concepts were in turn influenced by the need to demonstrate literacy under pressure as part of the assessment regime was worth noting at this stage of the analysis. Several of the children talked about SPaG (Spelling, Punctuation and Grammar) with the understanding that it is an assessment criterion across the curriculum, others talked about writing under time constraints or having to be creative to order. Literacy, like memory was an important factor forming part of these participants' self-theories.

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5.6 A case for developing learning literacy

There was a difficulty with language for participants and parents when it came to talk about learning, for example participants were using colloquialism and personal metaphor in order to describe what was happening when they were learning. This was pointing to a need for a level of "learning literacy" to assist with the development of a shared model of learning that is explicit and can be understood by educators, children, and parents alike.

These children were also weaving into their learner identities information about themselves gleaned from setting, comparisons, and grades. As I tried to peer into the "black box" to see how individuals function as learners, I became conscious that these children were also trying to make sense of their learning and development. They looked out and saw themselves reflected in a

rather distorted set of mirrors: decisions and judgements made of them by teachers, schools, and national policy makers. How else were these children to know how successful they are being? We are struggling with our own model of learning and definition of success in schools as practitioners. What model do we present to our pupils?

High stakes accountability systems have made us complicit in holding up a distorted mirror to our learners. Ofsted has for the first time presented a model of learning - "knowing more and remembering more" - in an attempt to move schools away from "teaching to the test" which they say has had a deleterious effect on the abilities of school leavers. At the time these interviews were conducted, however, there was no nationally agreed model of learning, even one as simple as this, instead there was an accountability system whereby pupils' performance in examinations were used as proxies for the performance of teachers, departments, schools, and local authorities. In spite of Ofsted's attempt at a definition of learning, these accountability measures still dominate school cultures. But in England the introduction of Progress 8 as a way of reporting on school performance along with the harder linear examinations at GCSE and A level has created an even more distorted mirror. In order to achieve comparable outcomes each year a third of each national cohort needs to "fail" their mathematics and English GCSEs and is then required to re-sit these subjects until they "pass" once they have left school. This definition of successful learning, based on achieving in a narrowing curriculum, that devalues creative and technical subjects, by doing well in assessments that emphasise memorisation and literacy which a third of each

annual cohort is destined to fail makes it very difficult to present a model of academic growth to children based on the notion of real mastery. Dweck's work does aim to allow for a model of learning and a true mirror to hold up for learners to see themselves, but it is a big ask if it is to have lasting and profound impact in a system that presents such distortions for learner identities.

Chapter 6 Drawing it all together

6.1 My research questions were:

a) To what extent are mindsets binary? Are children simply growth or fixed-entity, or do mindsets vary for individuals across different activities?

b) Do Implicit Theories of Intelligence have an impact on school outcomes in terms of grades and destinations?

c) What are the processes that lead from Implicit Theories of Intelligence to school outcomes?

d) To what extent are there more complexities involved in the translation of Implicit Theories of Intelligence into outcomes? e.g. the social and reciprocal nature of education, or the role of communities, families and parents?

e) The one-shot interventions around mindsets create marginal impacts that are difficult to sustain: what CAN schools do to improve the learning experience and outcomes for children?

What could I discover about children's mindsets and their learning experiences by hearing their voices, listening to their parents' contributions to academic reviews, and following their "learning journeys" over three years of their secondary schooling?

This study looked at the learner identity formation and learning journey of eleven different children over three years in a secondary school, some of whom felt a sense of belonging in school and some of whom felt distanced from the school environment. In each case, however, it was possible to look in

detail at their multi-faceted learner identities, including their Implicit Theories of Intelligence but so much more besides, to see how their unique social and individual identities responded to being in education.

6.2 Contribution to knowledge

This study contributes to a broader and more complex understanding of Mindset Theory whereby Implicit Theories of Intelligence form part of a child's learner identity which is made up of competence beliefs, aspirations, a sense of self in relation to learning and, crucially, an implicit model of learning. This model of learning is an image or idea of what learning is and how it happens. One of the most important findings in this study was the role played by family, particularly parents, in articulating this model of learning. Parents who understood the processes involved in learning and who could use their understanding to support the development of metacognitive strategies and self-regulating behaviours in their child were successful in countering the impact of fixed entity thinking in their children. Conversely, parents for whom learning was an unknowable process became frustrated or distanced and their children struggled to make progress or to manage the emotional impact of their struggle. This lack of an implicit model of learning could undermine any positive potential of a growth mindset.

I have called the shared ownership of an implicit model of learning, together with the ability to articulate it and use it in support of learning, "learning literacy". It is a conceptualising language, allowing the processes involved in

learning and overcoming setbacks to be discussed by parent, child and educator so that learning is seen as real, incremental and possible to the child. In the most successful learners in this study, it was a literacy that originated with the parent.

Insights afforded by the study into the impact on learner identity of school activities and systems were also part of the study's main contribution. The testing of primary school pupils in KS1 and KS2 SATs, the process of transitioning to secondary school, setting by ability, types of assessment, curriculum values, and school accountability and performance measures all impact on learner identity in ways not clearly understood by policy makers. These organisational features of our education system are not separate from children: they are the medium in which they grow, and they have profound effects on their sense of themselves.

The study's findings are important as they suggest that, whilst Mindset theory is an important part of understanding what leads to or deters from academic growth for children in secondary education, the theory needs to be placed in a broader and more complex understanding of the experiences of learners. This new understanding of how mindsets work with other factors in the lives of children has the potential to contribute significantly to the work of practitioners, system leaders working on school improvement, and policy makers.

The attempt made in this study to learn more about the connection between Implicit Theories of Intelligence and academic growth suggested a set of interlocking complexities. Implicit Theories of Intelligence are part of a complex learner identity, unique to each child, and are themselves complex. Children had individual mindset profiles whereby they displayed resilience in some of their learning but helpless responses in others. The creation of these unique mindset profiles was in itself a complex process. Children with growth mindsets tended to deal more effectively with setbacks than those with fixed entity mindsets but there was enough variation in the trajectories of participants to suggest that there were other significant factors involved in their ability to achieve academic growth. This goes some way to explaining why it has been difficult to achieve significant and sustained impact as a result of mindset interventions alone. These have tended to involve mainly malleability priming, by which children are taught that their brains can grow with learning effort and that intelligence is not innate or fixed, and tested before and after this intervention to see if they are able to learn more effectively.

The complex whole of which mindsets are a part includes learner identities – made up of competence beliefs, aspirations, and a sense of self in relation to learning - and an internalised or implicit model of learning. This model of learning is an image or idea of what learning is and how it happens. Mindsets, implicit models of learning and learner identities are interrelated and work in a dynamic interaction throughout a child's educational journey. This unique set of components also interacts with family, community, and school so that the

296

dynamic interaction of Implicit Theory of Intelligence, implicit model of learning and learner identity are all affected by wider cultural contexts. Finally, this culturally situated and complex learner identity interacts with the mechanisms of learning themselves (intrinsic motivation, metacognition, self-regulation and feedback) to produce either academic growth when conditions are favourable or to experience difficulty when conditions are less so.

It is this complexity that moderates between mindset and outcomes for children. Such is the significance of these conditions that children with fixed-entity mindset scores can still achieve academic growth whilst children with growth mindsets can find education so challenging that their outcomes in terms of grades and destinations can be compromised.

Mindset theory has a lot to offer educators. It challenges the idea that we are born with a certain amount of intelligence and that this cannot change and celebrates the growth that is possible when conditions are favourable for learners. For educators to understand that some children believe they can become more intelligent by engaging positively with learning, whilst other children believe that this cannot happen, is helpful in explaining some of the behaviours we see around learning. The solutions attempted thus far - effort and process related praise, language that re-orients failures as positive learning experiences and direct instruction about how the brain learns - have possibly not worked because children and learning are far more complex, affected by other significant factors, and constantly interacting with complex contexts. In some cases, these factors help to explain the relationship

between mindset and outcome but, significantly, help to explain how in some cases the outcomes can be unexpected in relation to mindset.

The significant factors revealed by analysis of the 11 participants in this study were:

- The influence of family narratives on learner identities. Powerful accounts of what a child is good at/ bad at, the inheritance not just of talents and skills but interests and the interpretation of prior learning experiences were drawn on by participants to form their sense of themselves as learners.
- The experience of primary school and then early secondary school. Children interpreted information derived from these experiences, for example setting within a primary school class or successes and failures in year 7 and 8 at secondary school, using the information to calibrate their complex learner identities.
- Transition to secondary school which can cause stress to mindset profiles and learner identities, changing or confirming perceptions of competence in ways not always understood by the secondary school.
- The ongoing calibration of children's complex identities during their lived experience of school, particularly in response to setting, comparisons with peers and assessments.
- The breadth of the secondary school curriculum and the perceived valency of subjects which means that decisions about effort are sometimes expedient rather than related to mindset

- What is assessed and how it is assessed which determines the definition of success and thus impacts on learner identity. For the cohort in this study, passing linear examinations in a narrow range of subjects with high demands on literacy and memorisation defined success and affected learner identities.
- Learning literacy – an understanding of the processes involved in learning together with the ability to articulate that to others - has significant potential to promote academic growth. Incremental thinkers are at risk of underachievement and poor wellbeing if conditions, particularly deficits in learning literacy, put them at a disadvantage.
- When parents themselves have high levels of learning literacy and share that understanding with their children this can have considerable positive impact on academic growth, conversely, when parents are struggling to understand or to articulate the processes involved in learning this can put their children at more of a disadvantage.
- Children do best when they combine intrinsic motivation, metacognitive understanding, self-regulation and are able to respond positively to high-quality formative feedback.

This study highlighted that learning is a complex process at the heart of which is a shared "contract" between children, families, and schools. The process is reciprocal and dynamic, it involves the cognitive and the emotional or affective dimensions of development and, like any complex process or system, it tends not to respond in a sustained way to a single intervention. This study also discovered the importance of understanding how children and families

299

describe themselves as learners, what is important to them, what they understand about the learning process and how they manage setbacks. It uncovered the impact of judgements made by teachers and schools about children as learners as well as revealing a value or valency hard wired into the current education system about the subjects that were considered high or low status and the impact this value system has on individuals. It glimpsed the mechanisms inside the individual learners' "black box" that either worked together to move a learner on or that stalled and led to learner decline. Most significantly the study suggests that learning literacy is at least as significant factor as Implicit Theories of Intelligence in determining academic growth.

To date, mindset theorists like Dweck have recommended that educators value effort, avoid intelligence praise and attribute success to learning strategies rather than innate ability. They have also recommended explicit teaching about how the brain learns as a key element in schools' work to mitigate the effects of fixed-entity thinking. Dweck herself has expressed dismay at the way her theories have been distorted by practitioners, reduced to posters telling pupils that failure is good, and that effort makes dreams come true, stating when interviewed for a news article:

"We were wrong that we thought it was a simple concept" (Bloom, 2017).

Chapter 7 Recommendations

I set out to further understand the relationship between Implicit Theories of Intelligence and outcomes for children in secondary schools and to find practical ways to help educators to engage with mindset theory in schools. The following set of recommendations for school practitioners are based on the findings of this study.

7.1 Careful transition

As children progress from primary to secondary school they bring with them a sense of themselves as learners that is already under formation. They carry their family narratives and their primary school learning experiences forward and use those to work out what they are good at, what they enjoy, what their families value and how they compare to others in this much bigger place. Schools need to engage with these emerging learner selves in the most child centred way they can, looking beyond the data that tells us about their KS2 SAT scores to hear the voices of these children and their parents as they tell us about themselves as learners in the broadest sense. This needs to be the start of a very important relationship between parent, child, and school on which many of the other recommendations emanating from this study are based. This work is demanding of resource and capacity, however, so unless the system recognises the true importance of this relationship, rather than pay it lip service, it will be difficult to establish. The current absence of SATs and the need for better dialogue between school and home about learning due to

the way the system has had to respond to the COVID-19 pandemic could lead to a more enlightened approach to transition, however.

7.2 Understand the impact of school-based judgements on learners

It is important for teachers and departments in schools to understand how children interpret the information given to them about themselves as learners through assessment grades and particularly through setting if that is being practised. Schools probably underestimate the power of setting to impact on learner self-concept and rarely acknowledge that these within school comparisons could be wildly inaccurate when placed in national data sets like SATs or CATs. Nevertheless the learner self-concept that develops as a result of this often-inadvertent categorising of pupils can have a significant impact on their experience of learning, their decisions about their futures and their wellbeing. Children use comparisons with peers to try to calibrate their learner self-concepts and this can serve to affirm their good at /not good at mindset profile rather than create energy inside the "black box" learning mechanism. In this study, only participants with high levels of learner literacy were able to withstand the impact of unfavourable comparisons through setting or through grades.

Educators need to ask some profound questions of their practice when assessing and feeding back to learners and to be clear about the important difference between formative and summative assessment:

What will the learner be able to do with the assessment information I am giving them? What will it mean to them?

Will it reinforce an unhelpful self-concept, or will it help them to improve their metacognition?

Does this learner have sufficient levels of learning literacy to be able to use the information I am giving them in this assessment? If not, what do I need to do instead in order to improve their learning literacy?

There are implications here for whole school assessment policies, the practice of individual departments and teachers and for the professional development commitment to consistent, informed assessment practice across schools. School assessment systems do not currently consider the mindset or learner identity of pupils. There needs to be a focus on assessment practice that deliberately develops learning literacy. There are some good examples in the study, like the geography star chart, on which to build this practice.

7.3 Expand the school system's value for different kinds of learning

The English accountability system places a higher value on traditionally academic subjects as defined by the English Baccalaureate, than it places on creative, technical, or practical subjects making it very difficult for individual schools to achieve parity of esteem. This imbalance certainly had an impact on the participants in this study: children who were confident academically were not too concerned when they struggled to develop practical skills, whilst children who found subjects like English and mathematics a challenge did not

find that successful learning in practical subjects gave them high learner status and often looked outside school to identify with communities that valued what they could do.

In any definition or description of learning it will be important to include and give status to the processes involved in the development of creative, technical, or practical abilities, bringing in the views of the wider community to balance the narrowly academic focus of the current national educational priorities. The school attended by 6 of the participants for KS4 was a new Studio School, deliberately designed to promote parity of esteem between traditionally academic and vocational learning. The cohort were part of its first intake and there was a way to go for the school in terms of achieving that parity but those children who took technical specialisms in the Studio had their strongest outcomes in those specialisms, even Kai, who only completed one full year of KS4 in school. The creation of the Studio School shows that it is possible for individual schools to promote parity of esteem in the system, but this issue does need to become part of a wider national debate about our curriculum values and vision for education.

7.4 Develop an understanding of learner literacy shared by children, parents, and teachers

The most significant finding of this study was the identification of learning literacy as the most important factor in the success or otherwise of the participants. What exactly did effective learning literacy look like?

It was shared: parents and children had sufficient common language and implicit modelling of the learning process to describe it, discuss it, repair it, and negotiate it with professionals in school. It comprised vocabulary that related to learning as something that developed over time through practice, seeking support, not being afraid of failure or setbacks and good enough effort. In the absence of an "official" language around learning parents and children reached for colloquialism and metaphor. Participants talked of things "clicking" together like jigsaw pieces, or of "picking up" new knowledge and working on making it "stick". They discussed repetition, quizzes, getting tested by others and explaining understanding to others as effective revision techniques and they knew how to ask for help from teachers, peers, or family members. They also used emotional language about learning relating to enjoyment and interest, as opposed to boredom or lack of interest. The children who talked in this way about their learning tended to be more engaged and more successful with learning regardless of their Implicit Theory of Intelligence.

It should be possible to explain learning to children and their parents in a way that makes sense to them, using accessible language and demystifying the process. If this language and process modelling is also shared by teachers so that it underpins the curriculum and the assessment systems in school, then all children could have the opportunity to develop a learner literacy. In an ideal world it would inform national education policy and be shared by all involved in education. It is a piece of work that would be worth attempting by educators in schools.

Based on the issues that learners were confronting in this study a description of learning needs to address:

i. The place of literacy in learning: why learning new words is important and how to do that; why different types of reading are important and ways to engage with a variety of texts; why different types of writing are important and how to plan, structure, practise and review them.

ii. The place of memorisation in learning: how remembering something we've already learned helps us to learn something new (the develop of schemata); how to try different ways to remember and decide on one that works for you; how recall is important every day, not just in tests.

iii. How our working memory works, how to reduce cognitive load and the difference between short term and long-term memory.

iv. How education is using neuroscience to understand "wiring and firing", neural pathways and the role of the hippocampus in long term memory. This helps to explain the usefulness of repetition and retrieval practice that can be seen by children and parents as having little value.

v. The different reasons we can get stuck, how it's not our fault or a reflection of our intelligence and how we can get unstuck: how to ask for help; how to work through the stages of a problem; how to have a go without worrying if we get the answer wrong.

vi. What good enough effort looks like: little and often; maintaining momentum; working smarter; planning and checking; starting early enough; learning to defer gratification, to self-start and to self-stop (self-regulation).

vii. An acknowledgement of the challenge involved in "slow" learning: why we prefer quick and easy tasks; why we need to push through our resistance to slow and difficult and some ways to do that. This needs to be acknowledged by teachers and by the performance management observations that tend to favour pace in lessons.

viii. A description of the different types of learning that happen across the curriculum: the development of practical skills; the nurturing of creativity and the power of originality; the development of employability skills such as collaboration, emotional intelligence, and work-place learning.

7.5 Develop parental understanding of learning literacy.

This is the most difficult challenge for secondary schools as parents tend to step further away from the curriculum at secondary school and rely more on the student-teacher dynamic to create learning. As with any public messaging campaign it would be sensible to communicate learning literacy to parents through every medium and on every platform available: at induction, through paper based and web publication; through one to one and small group discussion like pastoral support meetings or academic reviews; and through presentations, workshops, and masterclasses. Better still if a focus group of parents helped to develop the learning literacy model and advised on the communication strategy in order to avoid the model being patronising or school dominated. A group of colleagues in the Studio School has started to work on a strategy to develop learning literacy for its students, teachers,

307

parents, and professional partners. The strategy includes working with parents to develop the model, the language, and the messaging.

7.6 Develop teacher knowledge of learning literacy and ensure whole school systems are based on it.

If all teachers had the development of learning literacy as a starting point for their curriculum design, their lesson planning, their assessment systems, and their professional development then learning literacy would be central to the lived experience of school for all children and would be both coherent and amplified. In the past "learning to learn" has been delivered through "bolt-on" activities but more recently practitioner researchers like Quigley have urged educators to incorporate metacognition and self-regulation into their teaching (Education Endowment Foundation, 2018). This development of a system wide learner literacy would be a paradigm shift in terms of emphasis: not only would it have at its core the belief that intelligence is incremental not fixed but it would also explain to all the key stakeholders, teachers, parents and children, what incremental growth looked like and provide them with the manual to access it.

7.7 Focus on intrinsic motivation

This study showed just how important enjoyment and interest were for children when they were learning. As educators we cannot leave this to chance. We need to take every opportunity we can to convey our own passion

and excitement for learning, we need to think of ways to keep children curious and questioning and to make sure that difficulties are pitched at the right level so that children feel challenged rather than bored and so that they can experience the feeling of well-being afforded them when they master something. Teachers need to understand the importance of intrinsic motivation within the wider range of motivation issues and to find ways to engage with their students when this does not see to come naturally. Without it then much of the effort that will go into developing effective learner literacy across the system could be wasted.

7.8 Contribute to the national conversation about the need for reform.

The learning identities of participants in this study were shaped to a considerable extent by a curriculum and assessment system dominated by a view of social mobility that privileged entrance to Russell Group universities and by an accountability regime that penalised schools which did not focus on a narrow range of subjects at GCSE. Norm referencing the examination results of annual cohorts with the aim to achieve comparable outcomes year on year meant that a third of each cohort would always "fail", in other words would not achieve standard passes in English and mathematics. The odds were stacked against the participants with low prior attainment and those with SEND whose learning difficulties meant that the literacy and memory challenges inherent in the new, intentionally tougher GCSE examination papers were going to be significant obstacles. These children had to work very hard and draw on considerable personal and social resources to be able

to feel valued and capable. The same was true of those children whose preferred domains and whose sense of self-efficacy were associated with the creative, practical, or technical subjects which were not valued in accountability regimes or by parents, even parents of children who excelled at them.

The accountability regime has led not only to a narrowing of the curriculum and a devaluing of subjects deemed "non-academic", but it has also had an impact on pedagogy. When they were in primary school these participants studied "literacy" rather than English, and rather than revel in story, language and word play, they were preoccupied with spelling, punctuation and grammar accuracy, defining themselves as good at or nor good at their own language accordingly. At Key Stage 3 they were aware of looming GCSEs with their emphasis on memorisation and defining themselves as good at or not good at a subject depending on how well they could remember knowledge for tests. Schools, acutely aware of the pressure to add value in terms of progress 8 scores, are looking to research that helps them improve their students' ability to remember so that they can perform well in linear examinations at the end of five years. Practices like Rosenshine's Principles of Instruction (Sherrington, 2019) retrieval practice, interleaving and spaced practice are common parlance in staff rooms and classrooms. These practices are certainly helpful to children as remembering prior learning is a crucial part of new learning. However, this study has added some understanding of what is going on for children and suggested we need to look at a broader range of issues. To do that we need to be freer of the constraints imposed on the profession by a

narrowing curriculum and high stakes accountability regime based on examinations.

It is important for educators to contribute to a national conversation about the future of schooling in England and for there to be open and honest discussions, based on research evidence, of what is enabling children to become successful learners and what is holding them back.

7.9 Encourage school leaders to be researchers in their schools.

This study has been unusual in that it was conducted by a senior school leader within their own school. It has served to demonstrate both why this is something that should be encouraged and how school leaders can use research in their schools.

School leaders are responsible for a whole school "ecosystem" and need to weave together strands of knowledge, understanding and learning into the complex living structures that are their schools. This study used a particular lens or conceptual framework – in this case mindset theories set against the wider context of lived experience – to uncover a deeper understanding about the learners in a particular school, but then for the school leader that deeper understanding needed to be contextualised into the complex living structure. This needed the detailed knowledge and understanding of the context afforded to a practitioner by a leadership role. There is a powerful movement championing evidence-informed decision making in schools typified by the

EEF's "what works" approach which has very recently been taken up as a "golden thread" in the career long development of staff, starting with the Early Career Framework, continuing on through new National Professional Qualifications and held together by the newly designated Teaching School Hubs. In their recent call for schools to bid for Research School status the EEF is clear that it, "regards evidence to mean research that is systematic, robust and focuses on pupil outcomes" (Education Endowment Foundation, 2021). Much of this evidence is based on efficacy trials and as such provides useful starting points for thinking about school improvement, especially when leaders use the EEF's Implementation framework to plan for sustained impact in their schools. However, as with any complex ecosystem, changing a specific element of the environment or practice impacts on the whole system and this is why it helps school leaders to be experienced researchers themselves. In order to implement any change, they need to be able to understand their school, its practitioners, and its pupils in a detailed profound way and in particular to anticipate the connectedness of elements of the system. I have tried to show this by describing an interconnected set of elements that need to work together if a school is going to be able to help fixed-entity thinkers to achieve academic growth.

7.10 Next steps

7.10.1 Limitations of the study

Whilst the study set out to use the constrained lens of mindset theory to answer questions about successful and unsuccessful learning in secondary schools, the analysis of the data from curriculum interviews and academic reviews pointed to a highly complex and wide-ranging series of interconnected issues too broad for the study to investigate in depth and detail. The study set out to examine the relationships between mindsets and children's experiences in school in the hope that I could discover ways to move learners from fixed-entity theories so that they could learn more effectively. In designing the study, I focussed on a series of interactions with the participants that would concentrate on their school-based experience. I was not expecting the role of parents to be so central to the findings. Whilst I did gain helpful insights into how parents supported learning through the children's own accounts and through the parents' contributions to academic reviews, it would have benefitted the study had I been able to conduct a series of semi-structured interviews with the parents in order to elicit further insights into their beliefs about the learning process and their children's experiences of it.

The children and parents also revealed the importance of primary experience and transition experiences to learners' identities. I was aware, however, that I was hearing their recollections of these early experiences rather than

witnessing them first-hand. I could only comment on the impact of these narratives of past experiences on current realities for participants. It would have been helpful to do further work on the primary school and transition experience in order to see learners' experiences in real time.

I would also have liked to work in more depth with teachers during the study to discover more about their thinking about the learning process. Analysis revealed that some teachers and some departments were more effective than others in achieving academic growth for pupils with different mindsets. It would have been interesting to see if different understanding of the learning process itself led to these different levels of efficacy.

The study was limited to 11 participants in one year group in one school who then divided into two schools with the advent of the new Studio School. Schools can differ very much, and this study was not able to extend into the lived experience of school for children in other settings.

7.10.2 Future research

The three areas above – primary and transition experience, parent beliefs and teacher understanding – would be useful areas for further study. There is a growing body of research around the impact of testing on primary school pupils (Reay & Wiliam, 1999, Booher-Jennings, 2008, Bibby, 2009, Bradbury et al, 2021) and this study suggests that the identity formation that happens in primary school is a significant factor in children's experiences in secondary

314

school. It would be beneficial to look in depth and detail at children's identity formation, including implicit theories and implicit models of learning during their primary school and transition experiences. If a series of recommendations about transition could be produced as a result that would be helpful to children, parents, and schools alike.

Semi structured interviews with a wide group of parents would allow for a more detailed exploration of parental beliefs about learning, including their understanding of how to support learning. This would help in the production of parent-specific materials to help them support their children's learning and school experience. It would be particularly powerful if parents themselves could co-construct the guidance or information for their peers.

It would also be helpful to conduct a series of semi-structured interviews with teachers from different phases and types of school to arrive at a deeper understanding of their thinking about mindsets and the learning process. If the work could extend into action research enabling a group of teachers to produce materials for colleagues on the development of learning literacy in children that would again be helpful.

Ideally, parents, teachers and children would be able to work together on creating shared language and understanding around what actually happens when we are learning.

7.10.3 Taking the theories to the profession

I am hoping to work on these suggestions to explore the issue of learning literacy and associated recommendations and to produce accessible resources, co-constructed by parents, children and teachers that support the development of helpful shared language and models to explain how learning happens. I will be able to share my findings and the progress of the project with the two schools in the Multi Academy Trust where the study took place but also within the wider local network of schools through a series of groups who already collaborate effectively, for example the South Lakes Federation of schools, the Local Association of School Leaders, the County Association of System Leaders and the primary and secondary heads' associations, together with the newly formed Teaching School Hub.

The teaching profession is starting to engage with research to inform practice but is being steered by the DfE and organisations like the EEF in terms of the research with which it is able to engage. For Dweck enthusiasts, the repeated doubt cast over the relevance of Mindset Theory by low effect sizes in efficacy trials means that strong voices within the profession are starting to reject the theory, not least because it has been so misinterpreted by classroom practitioners. That would be unfortunate as there is no doubt that Dweck's theories around mindsets are very helpful in helping us to understand learners. I would argue that they need to be understood as part of the wider, more complex context that is the contribution to knowledge made by this study. Working with stakeholders to co-design, co-construct and co-deliver the

resources and school improvements recommended as a result of this new understanding of the role of mindsets in learning could have real impact on the progress of children in schools.

Appendix 1 Transcript of a focus group session
10 January 2017
PD session with whole cohort. Group presentations on what makes a good teacher?
Group 1: Lennie, Andy, Oona, Beth

Lennie : so a teacher that gets involved instead of just writing on the computer doing notes- actually going round the class helping you. A teacher that knows that you don't like everything so you find some common ground with them so they don't think you like everything and know everything about the subject and a teacher that helps you.

Andy : I said a teacher with a sense of humour so then if you say anything in class or anything that you see on the board or anything that you think is funny then they don't tell you off or anything for laughing.

Rosie: a teacher that says things really clearly because I find it really hard to understand if they go through it really quickly

Beth : A teacher that understands if you don't get it right so that they explain it to you maybe how YOU would understand it

Mikey: A teacher that's fun but fair so that you can have a bit of a laugh in the lesson (inaudible)

Me: Lennie have we got anything else on there that you've put that you need to explain?

Andy : (points to a post it by Lennie and says something inaudible- some giggling from the others)

Me: What was that Andy - something about get involved?

Andy : Well, I don't know what it says

Lennie and me simultaneously: it says get involved

Andy : I thought it said getting revolved!

Lennie: there's no R in that.

ME: are there any more of yours Lennie

Lennie: again, a teacher that doesn't shout if you get it wrong. That goes through it instead of just shouting it all out and saying that they expected you to get it.

Me: Ok

Lennie: because I can't follow what most teachers say,

Me: Andy , have you been able to pick up all of yours? Who wrote the little group at the bottom left hand corner? Was that you Andy ?

Andy : yes.

Me: Do you want to read them out and explain what you've put?

Andy : I've put one who has no rules, then you don't have to worry about anything. (girls giggling) and then there's one that says lets you say what you want because say you say something you're not meant to but then they don't get angry . Casually late so then they don't try to act like they're young not old. Just watches movies because work's kind of boring. (Much laughter)

Me: Right...

Lennie: we're trying to describe the perfect teacher not one that wants to get fired.

Me: Yeah, you're all laughing girls. Can you explain why you're laughing?

Beth : (still giggling) because if there was no rules there probably would be no learning.

Rosie: maybe that would be brilliant

Me: so brilliant would be no learning and no rules?

Beth : we need learning …maybe it's like there's a certain set of rules so like some teachers you have one lesson where a teacher says summat then you do the lesson the teacher says something different to what they said

Me: so different teachers having different standards is that what – is that a problem?

Beth : yeah, so if they stick like to one standard it would be easier

Me: yeah so one standard would be easier, ok. Right, Mikey was there anything else on there that you thought was worthy of comment?

Mikey: Yeah I think for them to be quite confident and not stutter al of the time because it's really hard to learn from them

Me: so presentation skills are really important like the performance bit of the job isn't it? How about you Beth ?

Beth : doesn't hold a grudge if you do something wrong in the lesson so if you do something early on by accident in the first lesson then they keep it for the entire year

Me: oh really. Does that actually happen?

(Some pupils join in saying yes)

Oh I won't ask you to name names but...ok last but not least how about you Rosie?

Rosie: I wrote two and they've both been said.

Me: so...if you had to pick out one thing each and you were going to say this to someone who was coming into teaching for the first time. You're the experts on teachers. You're the absolute experts. This is something you know

such a lot about. So if you were to give somebody who was brand new to teaching some advice about what to do what would it be?

Lennie: Get involved with the student

Me: what do you mean by get involved with the student?

Lennie get involved with their work so say if you're in DT they help you they get involved in the work or if it's in English they help you with things. They come round.

Me: so they're getting to know you personally as a student and getting to know your work personally?

Lennie: yes

Me: that's really great. Andy ,

Andy : Having a sense of humour so you can have a laugh with them and they're not strict

Rosie: Explaining things clearly so that we can understand what they're saying first time.

Beth : Understand that everyone's brains work differently so you might explain it all right to one person but then another person might not get it

Mikey: Don't shout because it puts you off the subject and doesn't make you work as hard.

Me: ok - so shouting doesn't help? Ok, thank you very much indeed.

Appendix 2 Alex's data coding table as an exemplar

Data coding table May 2018: Growth Mindsets are not the only answer

Alex – year 9 interview

Initial coding	Category development	Thematic coding
You work hard for it	Expresses a growth mindset attitude to effort	Mindset
You have to get on to get your intelligence built up / just concentrating/ not messing about as much	Aware that effort means good learning behaviour	
I'm just not good at it really – RPE .I always end up making mistakes, it always goes wrong for me	Fixed entity thinking	
I'm good at DT , good with tools, good drawer	Fixed entity thinking	
I'm not the person for drama – rubbish- not too good at it- I can't sit still you see	Fixed entity thinking	
Doesn't enjoy or like history – I just don't understand it so I just don't think I listen as much	Lack of understanding plus feeling it's not relevant leads to low effort	Resilience
Tried hard to improve handwriting	Overcoming difficulty	
Deciding to work harder in mathematics as he want to pass it to avoid resits post 16
You need your mathematics in life
Doesn't want to regret messing about in mathematics and then failing it
Aware of what he needs for the future – directly linked to a conscious decision to try in those areas of the curriculum
Doesn't see why he needs to learn history – want to learn about what's going to happen instead- doesn't understand it
Putting in too much effort would spoil his enjoyment (!)
Knows he needs to do well in Chemistry – but blames teacher for telling him off and hampering progress	Strategic decision making about effort	Motivation

Taking poor behaviour to a "certain spot" in Theatre Arts to have fun without getting into trouble		
Rugby and wrestling out of school – so I'm quite good at them	Extra curricular activities	
Works hard at things he values and enjoys and feels he can do	Engagement through self-efficacy	
Understanding maths more now that he's concentrating and putting in more effort	Aware of progress through concentration and effort	Metacognition
Finding difficult to stick to an argument/ construct a coherent line if argument in RPE (I always change sides)	Understand why he finds RPE difficult	
Good at DT but struggles with the writing bit I don't like reading but I don't say that to my teacher I ask about words I don't know I do better if they don't tell me I've got to write a lot – sometimes I lose all my ideas	Aware of difficulty with literacy	
Acknowledges that when he works hard at something he enjoys he gets better at it e.g. rugby	Aware of progress	
Homework, test and class work good but teacher feedback about talking in class at parents' evening means Alex feels he isn't making progress	Confuses comment about behaviour with judgement of academic progress (Chemistry)	
The teacher thinks I'm messing about but I laugh at others messing about I'm always getting told off so I don't feel I'm getting very far	Perceived role of teacher in progress / lack of progress (Chemistry)	Belonging
Likes it when teachers ask how he is etc/ ask about the farm/ make conversation You like the subject more and listen more when the teacher talks to you	Intentionally inviting	
Some teacher don't listen when you explain about the impact of the farm on your homework	Intentionally disinviting	
I used to be a good runner in primary school so I do a lot of sports	Primary school experience	History

Being on the farm means I'm good at using tools
Grandad's a good drawer so I've got his ideas as well
Will read the Farmer's Weekly or Guardian when I'm having my brew in the morning	Effect of farm and family on view and value of own ability	Family
Mum has insisted he works on handwriting and practices with him
My mum keeps nagging at me to read at home	Role of mother in developing learning and literacy	

Alex – year 9 academic review with mum

Initial coding	Category development	Thematic coding
Wants him to do something a little bit academic- values academic?
Observes transition problem with time given for writing – rushing has caused handwriting problems
Shares that Alex says he has done his homework/ revision before she lets him work on the farm '
Agrees that he doesn't do enough homework at home
Remembers that Alex went to homework club early on at secondary school
Asks if Alex can manage copying tasks from board
Tries to persuade Alex to take part in review positively e.g. encourages him to think of interesting word – he refuses
Tries to link farming aspirations to need to read	Parent contribution to Academic review	Family

Tells Alex he finds it difficult to read when he is refusing to contemplate reading for pleasure in review Both Alex and Mum remember listening to stories together when he was younger Mum shares that it's difficult to find anything that interests Alex Tells Alex that people won't admit to reading Uses affection – Love you have to Expresses despair – what are we going to do? Describes Alex as a visual learner and stresses importance of context for him Shares that Alex enjoys science experiments – accounts for his good progress here		
He was busy lambing and helping other farmers out during revision period and did not focus on revision Needs chemistry for mixing the chemicals for spraying But that's not enough to convince him to develop his reading skills !	Farming is main interest and motivation	
Chooses Geography because of link to the countryside and the landscape Reading is not most important You have to think outside of school, not just school What's wrong with farming magazines? I've read farming books but you get told off for bringing them in	Links to outside interest – farming, family interest	Motivation
Does homework in study skills time and very limited time at home He could have tried harder but thinks that is true of everyone else too	Does the minimum of homework	Resilience
I don't read through work when I've finished – once I've finished, I've finished	Very reluctant to use strategies to improve literacy	
Will not try to think of an interesting word from today	Refusing	

Mum tries to help him think but he digs his heels in – none where you are using interesting words T realises that by "using" Alex thinks we mean a word he has said aloud Strong refusal to read for pleasure / read fiction – if someone paid me a hundred quid I wouldn't do it- book aren't going to change my life – you don't need to read about dragons I can do it but I just don't choose to. I choose to write but I don't choose to read because it doesn't interest me at all Nobody else reads		
Thinks he could have done a bit more to revise for Geography – needs to be pressed by reviewer to say this	Unsure how to improve	Metacognition
Feels he has done better in English	Aware of progress	
Knows to use a mind map for planning extended writing and it helps	Planning and monitoring	
Gets extra time in examinations Doesn't understand difficulties associated with dyslexia (what do you mean?) Some teachers get the pace right for him – others no Gets notes in physics, chemistry and history Very little support with scaffolding writing tasks Nearly every lesson copying from the board- whole paragraphs Does manage to record homework in planner Doesn't go to homework club Geography teacher helps with providing vocabulary support for written tasks Does not access lunch time support Checking written work is very difficult for him – it makes my work more confusing – I always find something what doesn't make sense	Dyslexia	SEN

Very strong and sustained refusal to countenance reading for pleasure – mum adds that he finds it difficult (direct to Alex)		
Increased pace for writing tasks has caused problems especially with handwriting	Transition from primary to secondary	History
Reading books were all right at primary school	Primary experience	
Lunch time is for socialising – walking around school, going on the field	Belonging	Engagement
Girls make a load of rubbish up – when asked about fake news in our dispute about the importance of reading	Girls have less value	Gender

Year 10 Academic review – Mum couldn't attend the review

Initial coding	Category development	Thematic coding
We go through it and read it again and then all the words we don't understand we go through and mark it and if it hasn't been said I still stick my hand up and ask. I don't feel nervous about saying what it it,I just want to know .	SEN difficulties – help from teacher	Mindset
It takes me a bit longer than everyone else to write things down and I don't think he just quite understands that and he's always shouting come on in two minutes. I just can't do it in two minutes . He will put loads of motes on and we will have to pick the best five or something out and write it down. But today it's been alright because we've been copying out of a text book. All the key facts he had to read it, but we could do it at our own pace. (Geog) It's just with the examination, some of them were fine, but the longer ones were just, like the stages and then one of the questions, was like a high marker, it wasn't clear like it was a question. So I just missed that out completely. (mathematics) Mr…is just going too fast and I don't really understand it.	SEN difficulties – barriers to learning – lack of support for literacy / forced pace Literacy demand of new mathematics paper	

I need to do something about geography – that's one thing I know. I think it's more that I need to get on straight away with it. Especially when my big exams are coming up. I will do a lot more. A lot of revision.	Identifies area to develop	Resilience
As soon as I saw my paper, I thought I'd done better, because I understood a lot of the questions. I thought I could have done better than that. I did a lot of working out as well and that has got a lot of my marks as well. I think it was like the answers because I just didn't read the questions right. …some of them were fine, but the longer ones were just, like the stages and then one of the questions, was like a high marker, it wasn't clear like it was a question. So I just thought it was part of the top question and I missed that out completely.	Examination experience	
R: Do you struggle to motivate yourself? Alex: yes, say it's farming, I'll do it straightaway. Don't think I'm not keen on doing it, I just find it hard to get on and do it. Once I'm out of here. I'm out. Doesn't want to resit English and Mathematics – Yes it's worth it, Then I'm out. I said to my mum, I want to finish school, but she said you have got a lifetime to work.	School work – low motivation	Motivation
Especially when my exams are coming up. I will do a lot more. A lot of revision. I need to do it. Where I am working at, David…he has offered me a three day apprenticeship. But for my work experience I'm going to Carrs Billington Feed. He also named that because it's a bit different as well..Instead of just working, it's going to be a bit different.	Strategic effort	
I just don't know where to start I don't know which poems I should be learning. I don't know a good technique of writing.	Low strategy thinking	Metacognition

327

(science revision) I just don't do anything really. I should. …..Look through my nook or go and see a teacher. I didn't do any revision really. Well for my maths and my English, I looked through my poems and that was maybe like five minutes or something.		
I do understand them (poems) We go through it and read it again and again and then all the words we don't understand we go through and mark it and if it hasn't been said I still stick my hand up and ask. I don't feel nervous about saying what is it. I just want to know. The maths is alright. I'm understanding the maths and enjoying it. It's fine	Cognitive	
A lot more revision and listen a bit more in class I am paying attention, a lot more that I was doing, but I just need to focus, get everything wrote down from the board. I need to get down and with my exams as well Maybe I should do a lot more of good revision, instead of just a quick look through. I think , next time I will ask Miss….if she can get me some practice papers, like you have said. Not mess about in lessons, but make it so I concentrate (Geography) Maybe I should stick a note in the tractor My organisation skills are just all over. When I started year 10, I'm packing my bag on a night before I come to school, then I don't know what happened. I just got out of that routine and started packing it in the morning, so I've got into that routine. And get on top of my homework as well. Get organised instead of doing it the night before, do it a couple of nights before in case I don't get it, go and see a teacher.	Planning	
He said if I was struggling go and see him. But I should have gone and seen him, but I didn't.	Relationship with teacher	Belonging

We don't seem to get on (Geography teacher) R: Does he not get your cheeky chappie attitude. Alex: no he doesn't get that. It takes me a bit longer than everyone else to write things down ……two minutes. (see above) . I get grumpy with him and he gets grumpy with me. Mr…..said on parents' evening , he said if you stick with me and go and see him, he will help me through. He will be there for me. …He seems like he is the one to get it. I always tell him about my farming you see, he likes it. I like it when people understand. Say if we had a homework and it was busy with lambing and I would say could I just have another day or two and he would say yes. I would get the work done then. He was happy because I got the work done. I think it's just the mix up with the teachers, just getting to know them. But with different teachers, it's just different teaching techniques, to get used to them.		
When I'm sat next to my mates, I actually doa lot better, because I don't talk as much. We were in a practical and George came behind me and electric shocked me and then it just messed it all up and then I had to move back to where I sat. Like with team work, I'm good at speaking to other people	Peers	
		History
Yes, that's the issue. I've seen her doing all the revision.	Sister has worked hard	Family

329

Appendix 3 Coding table : parental comments during academic reviews

Category	Sub-category	Secondary subdivision	Note and quotes
Learning	Parent Implicit Theories	Growth	A: we say to him, right I want to see that one higher (effort grades) B: if you've got it wrong you just learn from how you got it wrong
		Fixed-entity	B: You think you are not very good at things but you are actually better than you think you are. K: because you are clever, so bright
		Attribution	V: I think you are selling yourself short. When you were revising you were really really good. You didn't shy away from Physics and the languages which you found the hardest. You tended to do that subject first didn't you? V: that's credit to what you put in , in your revision V: she has blown her dad and I away. She just gets on with it, nearly 14 and waiting for the catch. She has a very mature attitude towards learning. She knows what she has got to do it, gets on and does it. V: I think that is down to the effort she has put in. She

			really did work hard in her exams. V: certainly the hard work is paying off. The results should give you a boost of confidence. A; if you could persevere with your homework, just do that little bit more, and you did , and you got higher marks didn't you? A; he has just put that extra effort in B: it's all that hard work Beth B: you have got a beautiful Geography book
	Feedback loop	Numerical data	V: green is good isn't it? (understanding RAG rating on tracker) V: so it the yellow effectively behind target then? K : you keep saying to me why do I need to get my effort grades up? So you need to understand this. Ke: So this is all the effort there (EGs on tracker) E: so what's the yellow? So what's that- music? E: so that might have been a bit higher might it?

			E: the languages she excelled , she did very well in her language exams
			E: Ellie has been told by some subjects that the reason her effort grades are lower is because the subject matter is a lot harder because of the new exams that are coming through. (mum) R contradicts then Dad: So that is no excuse I understand.
			R suggests E not working hard enough : Dad: I think you have hit it in the button there. Fairly well.
			E: although English is a 3 (EG)
			Osc: gosh that's amazing how it feeds through doesn't it really apart from geography? (EG)
			Osc: I know it goes up to nine. I don't understand why that is when the effort is so…(low EG in year 10)
			I mean some of them are dreadfully low aren't they? But in some subjects, a couple of the subjects, fantastic.
			Is that because they have only one out of two years? I mean they are not going to know any more about the subject they are being tested

			on are they? Surely you should be getting a 9 in that. M: I think you've been quite open haven't you? You have spoken to us about the exams and the results. You've spoken about the areas of weakness and you can work off them . I think you know we have got time,. She's got time to work on those areas.
		Teacher comments	A; she actually said if he pulls his finger out and does that extra she thinks he could get a 7. She said he is capable of getting a 7. She said he just needs to put that extra in. Oo: like your geography teacher was saying about answering those questions in a slightly different way, just to get that extra mark, it could make all the difference. K: your chemistry teacher saying that you had been more focused. I think you did.
	Models	Process	A; he's got his strong opinions on things which are quite hard to change. He is enthusiastic. I think he could put a bit more into it. I think he could go that step further .

| | | | B: it's a good idea giving them the answers and the way to actually do it ,I so if you can't do something at least you can follow.

K: mind map – connects ….a decent length and then without kind of getting lost. In order for it to be digestible to read. It makes it seem so simple, it's just overwhelming if you don't plan it.
But what we need to do is write it down lie you say and circle it.

Ke: as long as you are doing that and concentrating and taking it in

E; there's a test you can do to find out what sort of a leaner you are. Is there any chance that E could have that test? (R explains) Dad: It puts you on the non-favourite instead of favouring the favourite.
E; (mum) With Sam he did and exercise test that showed what sort of a learner he was. Have you done that?
E; I think she's very conscientious. She always wants to do well…she's a good learner . |
|---|---|---|---|

| | | | Alex: (he is a) visual learner. You can tell him until you are blue in the face but If he doesn't see it, it doesn't work, Visual,.
Because it doesn't mean anything because if you don't see it in the context of it being used. I feel that Alex doesn't take it on board as much as he could do otherwise.

Osc: isn't there a plan where you have sort of an introduction , something else etc?
That's is the technique and the writing. But that is a common theme isn't it? Nobody knows better than Oscar.

M : I think she tries extremely hard. I don't think sometimes things come as easily to you as you would like them to. I thins she likes to hear things, so an auditory learner, at the same time she likes to look at her books. I know when you have been doing some of your revision you have been trying to do again, I suppose make different things to help you, visually I suppose, It is hard. |
| | | Revision | B: perhaps she needs to start a little earlier with her study |

			and do more early on then toward the end just do smaller re-caps. B: if you don't understand something leave it, if you are really stuck, move onto the next question and them go back to it if you have time E: the subjects that maybe are not as important we just breeze through the revision
	Reporting difficulty	Subjects	V: the maths you had a wobble on, then when she moved onto set 1 in the languages that was a bit of a wobble wasn't it? And your physics, you've always found challenging A; you were struggling with that weren't you? (Chemistry) revision) B; I know you struggle a bit with English don't you? B: we struggle with French don't we? Oo: we had a little wobble about English and I did get in touch with school about it. I was really worried about the quality of her work. Her presentation, her spelling, her grammar. Everything. Oo: you don't find it all easy do you? (science)

		Processes	K: it's interpreting , I think, its interpreting what's in here onto there. It's so hard for him to do. K: focussing. Two paragraphs and he's (n aargh!) OSc: he is keeping it all for the finals (effort)
	Early narratives		K: One of his teachers used to let him walk around the class whilst she was teaching . She used to give him things to fiddle with. It's always been a big thing with him. Alex: Until you came to high school you probably had the neatest handwriting in your school. It was very noticeable that your handwriting did deteriorate significantly when he came to high school. I can remember mentioning you know, it was a discussion when we first came , that it was the time. M: I do think even as a youngster I don't think you were great with phonics were you? Spelling had been …since she was little.
Support	Emotional support	Managing stress	V: we've talked about the fact, that there is no point in shying away from the subjects – We

			were talking about asking got be moved down in languages because you were having a wobble about whether you could keep up with the pace. V: what we said was just go and do your exams. See what happens, If they are not great we'll go in and have the conversation A: I said sometimes when you are your age if you think maybe the teacher doesn't like you I said without you realising you have a barrier put up in front of yourself …But I said we went in, we sort of talked, we didn't mention it, but we talked. We just said right , just go in a fresh start, do what he says, if you're struggling ask. It has since then been better. B: we need you not to get stressed out all the time You've got to help it when it happens B; you were getting stressed you didn't think you were going to know anything on it…before you know it you are all consumed by the fact that you are not actually going to be able to do it. When you can actually do it.

			E: she gets herself wound up about her exams. You don't like exams. Yes she does – her mum was the same . We try all sorts don't we? E: (dad) Don't let it get in your head and start worrying about it. Don't just let it flutter away,. Work away at it and then you won't be as scared when it comes. Osc: I know he is phenomenal in all sorts of ways, and I would imagine that Oscar would feel upset about it, wouldn't you? But it's not a done deal is it?
		Self-belief	B: You think you are not very good at things but you are actually better than you think you are. That's well achievable. Easily. A lot of it is self-belief I think. K: You said to me , I can't do that. This shows that if you keep doing what you are doing you will go up in your effort grades, that's all we're asking for. It's not hard,
	Practical help at home	Current	K: we kind of bounce ideas off each other so it we discuss the question and we bounce ideas off each other he comes out with some amazing ..then

			put it in a plan…mind map…and that kind of connects with that…
			K: he's given me all the ideas and the input and I've just typed it in, .
		Intended	A; we have got that board on the fridge you can do your homework to write on, write it up on that
			A: you were thinking of getting a bit of extra tuition out of school as well. He was struggling with maths.
			B: we can get you an Echo Dot and you can talk to that in French!
			Oo: try different pens
			Oo: you should find time. You have to say I don't understand that, I'm going to have to go through that again. Your dad can help you with maths.
			K: I think we should lock it in a cupboard (the x-box)
			K: Me and Philip don't mind if you hang out with us and do it (homework) It doesn't have to be a thing of solitude you can come and sit with us. If you want to find time with me I've got stuff to do on my computer. I'll sit at the kitchen

			table with you and Philip will. Let's do two hours from when you get in from school then, sitting at the table and I'll put snacks out. K: we could log-in EzyScience or you could tell us about it when you get home, tell us what happened in your lessons. K: if we could have a quick chat about you know it would be literally two or three things a day wouldn't it? E: you are very good with your drawing, you could put them on, and stick them up and every time you get new ones add them (revision cards)
Relationship with school	Supportive		B: too interested in spending time with her friends (lunch time clinics) If you don't ask you don't find out. Oo: be honest – It takes a lot to say that. (Oo admits to needing to be moved away from friends in lessons) Oo: it is such an important subject, you cannot drop a mark can you ? E: if you do your consolidation of an evening and there is an issue with something

			(dad) you've questioned it, so you get a higher grade M: you do enjoy coming to school
	Questioning		A: he was struggling with the Teacher as well as maths A: When we came to the review Andy was a bit negative about how he would be. Alex: and can you manage all that? (copying from the board)
Whole child advocacy	Health and well-being		K: I totally get that, why at the weekend you just want to be completely free. K: his consultant is sending the GP a letter to say they can increase his medication (for ADHD). If everything is alright with your sleep patterns and stuff then that's what he will be doing. K: It's his condition, he just forgets K: it's so good for your brain and the soul I would say, learning to play music. K:those things that are important, is the simple things that bring you joy
	Wider interests		A: He's lambing at the moment A: You are a bit like, I haven't got any PE

			K: he has done some brilliant practical stuff
			K: his understanding of book and literature is great
			K: there is your clubs as well. You go to Kick boxing and your Youth clubs
			K: Kai had to get on with these four people that he had never met in one little chalet and he was really helpful and really great weren't you? So that was relating to his communications skills and emotional intelligence.
			K: when we had the refugees over Kai helped out and set them all up fishing and stuff. …language barriers there but you got over those.
			E: you are just loving your photography at the moment aren't you? You've got a good eye for it haven't you?
			OSc: every time I go into my office I'm confronted by this sketch that Oscar did of Mick Jagger….it's absolutely brilliant. It is a character.
			M: we have said we need to go. We have been to France, Germany and Italy so we need to go to Spain.

			You are going on the school trip to Barcelona.
	Mitigations		K: he's amazing company. He's fantastic. He's hilarious. He's bright and cheerful. he cheers everybody up. He's great, He's absolutely great. Teenagers, typically aren't like that. So if he's like he is now he's going to be amazing when he's 22 but he'll be employed of course. (K: maybe) K: aw he's great isn't he? (re music performance) Alex: you just find it very hard. Alex you find it very hard to read. Because it doesn't interest him. It's very difficult to find anything that interests Alex.
Views on education system	Value of subjects		B: not everybody is academically minded …but they might be great at something else and you need to play to their skills to bring out the best in them. B: rather than educational (i.e. performance based BTEC) Alex: I'm sort of quite keen that he is going to do something a little bit academic as well as the other Biology and physics and chemistry you enjoy that

			because it's all experiments and you can relate to it. OSc: I was just a bit dubious about art at first, because I didn't think that he wouldn't particularly like all the elements of it and I don't want him to be taking the easy option. But then he's doing drama and art, isn't that a lot of urm….
	Examinations and assessment		A: it's been good these exams because I think it's made them realise they do need to put the work in to get the results. So I think it was quite a good thing. Oo: are you lot enjoying this change? Do you think it is as stupid as we do? I have friends whose children are in bits at the moment. It is just awful. E: I think too much was taken away from the course work. I was the same with exams Osc: Is it because their abilities are so spread out? I mean that's not right is it? (new grading system) I would have thought after 30 years of education you'd have sort of need that would be

			more you know…that there would not be such a discrepancy between one end and the other. I mean that is shocking isn't it? (disadvantage gap) So you are going back to O levels? (dad) It's very interesting. It's shocking and disturbing.
Home study	Homework		A: if you could persevere with your homework, just do that little bit more, and you did , and you got higher marks didn't you? K: he's not doing anything K: so when you told me you had no homework last night did you have any homework? Alex: When asked Alex tells us that he has done all his revision in his study skills is it? You did go to homework club for a while
	Revision		A: We bought them didn't we dad bought you the flash cards. A: we printed out the exam timetable before he even told me about it A: he did revise for his exams but I think he could have revised a bit earlier…but he did revise for them.

			A: you just need to put a bit more effort into revision I think.
			K: you really really didn't do much. Did you think you'd get by without it, did you think you'd do alright without it?
			E: she does work really hard. We also had a discussion that we didn't think she worked quite as hard as she normally does for exams. I didn't see her doing it. She was a bit too busy doing/ chatting to her mates on her phone (mum/dad)
			Mum: no she did work hard but there was a couple of subjects we knew you could have worked harder on couldn't we?
			E: I actually printed them off, was just before this lot of exams and I said try different techniques ,but I think it was a case of…it's too close to my exams to start. So now is a good time to start.
			(dad) You have to work a method out at which you enjoy. If you can enjoy it, you will do it more regular. If you don't enjoy it you will try and shun it away. It's got to sit comfortable with you.

	Organisation		Oo: you carry your bag around all week with everything in it. K: I could only find one maths book this morning so there is a maths book missing somewhere. So that's probably in your lesson is it?
	Self-regulation		K: I think what you are doing is waiting to go on your x-box. You are kind of wheedling around, flopping about and trying to find ways of getting on your x=box aren't you? Is it just because you'll do as you're told at your dads? You do as your dad tells you to do , you don't want to do what I tell you to do? I think Kai had got a bit of an addictive personality, so he can get completely obsessed with one thing. K: should I just be like a real pain and refuse to do my homework or I'll just have to do it because I'm here (after school study suggestion) K: so can you see how it's gradual you know you haven't had to sweat blood and tears have you? K: he has done for a bit actually. The last time you went on you did quite a few questions didn't you? (My Maths)

			E: it's just that phone every now and again. That's all isn't it? You get engrossed in it. But we know how to deal with that. Osc: there is hard graft in learning languages isn't there? That's the discipline really isn't it? OSc: this is something that could be addressed but obviously it would have to be a phenomenal amount of effort.
	Private reading		Alex: But it's moved on, you've got a bit older, you should be able to read older story books and I know things about dragons and that sort of thing you are really not interested I that , But we need to find something that even if it's Enid Blyton books or the Wishing Chair I know you think it's babyish but nobody needs to know that you are reading those sort of things Alex it's just to encourage you. People do a lot of things at home that nobody else knows about , Because nobody wants to admit to reading just because they don't. At the end of the day Alex they are

			not going to be there when you can't. You need fiction and things just to create a bit more imagination to help you with your English M: I think that might also help with the creative side of your writing as well, reading more.
Family dynamic	Parent occupation		Oo: I can help you with that. I did a degree in it. It was my specialist subject. You can come to my staff meeting next week. My year 5s were performing better than she was. I expect that in my year 5s
	Relationships		K: Is it just because you'll do as you're told at your dads? You do as your dad tells you to do, you don't want to do what I tell you to do? It's not somewhere he can just kick loose. K: Philip came out and said he's not doing his homework. So Philip said no more x-box Philip kept coming out and saying are you going to come down on him, he still hasn't, are you going to say something he still hasn't done this and he still hasn't done that. Oh he's going back on the x-box again, are you going to say something.

			K: you know he is a real pain when he comes home, but saying that he's amazing company. K: do you want to be a lazy person? Do you like being a lazy person? (K' I don't know why I'm like this.) Osc: I'm just like taking it all in. (dad's a man of few words) I haven't had much to say really. OSc: Well David's wife is French you see this is why he should be top notch. You've been talking French all weekend haven't you? You've solved the problem since that was done. He's been to France and visited all the castles. Dad's got a degree in economics- the thing is Oscar to do Economics you need to do history because it doesn't,make sense without history.
Careers	Option subjects		A: with the extra science and geography if he is at all struggling and also with his maths and the rest that he's got to do, we thought it might be good for him to do (study skills) A: you need to have the choice at the end of the day

	Aspirations		A: you can get apprenticeships straight after school.
			He just want to do something more hands on but we thought if left straight away from school to do an apprenticeship we just thought he would be best staying on at sixth form.
			Not that it's bad to go onto do an apprenticeship first.
			I think if he can cope with the work ..i think you stop on in sixth form.
			B: you want to be a primary school teacher so it's picking the subjects that are to her strength
			B: it was suggested to join the Navy as a nurse. I didn't know that.
			K: I think he wants to go into the sixth form and do some A levels. That's what he really wants to do.
			K: Kai wants to go and live in France and be a snow boarding instructor.
			K: he wants to be a rock star – well you do want to play your bass.
			E: she would like to do art in sixth form and she would like

			to do Photography and the ICT ties in with that as well Osc: can you get to university with both?
	Adult perspective		Oo: Adults you still plan everything about you. You have to have a plan, otherwise you don't go anywhere in your job. That is a life skill. Oo: we do that as adults. We talk about things in our jobs. If it doesn't make sense you go to your colleague …do you get than because I'm not sure that you do. Do you see what I mean? Oo: in the army you have got to be organised. You have got to be, they will knock it into you, if I can't. K: all these other people are going to get the jobs, the best jobs, well paid jobs, what are you going to get, you are going to get what's left over, or not, there might be nothing left over. K: I'm going to learn French as well. It he is going to live there we are just thinking of packing up and going. Alex: if you want to farm which you need to do you

			need to be able to read things Alex

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