

Students' Experiences of Target Grade Use as an Extrinsic Motivational Tool



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Abstract

Target grade use is a common practice in secondary schools in England, with the goal of providing an extrinsic motivational tool ahead of high-stakes assessments at the end of Key Stage 4, whereby students should aim to meet their target grade in each curriculum subject's assessment(s). This is the case despite a notable paucity of academic research to support their use. The overarching aim of this study, using Self-Determination Theory (SDT) as a theoretical basis, was to examine students' experiences of target grade use as an extrinsic motivational tool. In the 2022-2023 academic year, this mixed methods study collected data from students (N=499) using the Self-Regulation Questionnaire – Academic (SRQ-A) psychometric test and a series of focus groups. Through analysis in R, relative autonomy index (RAI) and target grade affinity index (TGAI) and motivation types were calculated from the quantitative data generated. Inferential statistics including linear regression, Spearman's rank correlation and the Shapiro-Wilk test were employed, while changes across the academic year were evaluated using the Stuart-Maxwell test and paired-samples *t*-tests. The focus groups were analysed using thematic analysis. The study found a weak but statistically significant relationship between students' motivation due to target grades and their overall academic motivation, and no relationship with motivation due to target grade use and their actual target grades. Students' attempts to set their own benchmarks to aim for was found to be a more common motivator than target grades, demonstrating students' efforts to introduce more academic autonomy by taking a pragmatic view of their education. The general ambivalence found toward target grade use means that this study introduces an opportunity to further examine whether target grade use is an appropriate method to support students' academic motivation and attainment.

Table of Contents

Acknowledgments	iii
Abstract	iv
Table of Contents	i
<i>List of Figures</i>	<i>vi</i>
<i>List of Tables</i>	<i>vii</i>
<i>List of Context Boxes</i>	<i>ix</i>
<i>List of Terms</i>	<i>x</i>
1 Introduction	1
1.1 <i>Background, Context and Aims</i>	1
1.2 <i>What are target grades?</i>	2
1.2.1 Types of Grades	2
1.2.2 Target Grade Generation	3
1.2.3 Origin of Target Grades	5
1.3 <i>Justification and Aim for the Study</i>	6
2 Literature Review	8
2.1 <i>Introduction</i>	8
2.2 <i>Self-Determination Theory</i>	9
2.2.1 Self-Determination Theory	9
2.2.2 Uses of SDT in Education Research	13
2.2.3 SDT and the present study	14
2.3 <i>Marketisation of Education and Measuring School Efficacy</i>	16
2.3.1 Government policy through time	16
2.3.2 Current assessment structure	19
2.3.3 Expectancy Effects, Predicted Grades and Estimated Grades	20
2.3.4 Summary	21
2.4 <i>Factors Affecting Students' Intrinsic Academic Motivation</i>	22
2.4.1 School Culture	22
2.4.2 Feedback from Teachers and Target Setting	24
2.4.3 Teacher-Student Relationships	25
2.4.4 Parental Influence	27

2.4.5	Intrinsic Motivation and Academic Outcomes	28
2.4.6	Conclusion	29
2.5	<i>Factors Affecting Students' Extrinsic Academic Motivation</i>	30
2.5.1	Feedback from Teachers and Teacher-Student Relationships	30
2.5.2	Academic Entitlement	36
2.5.3	Parental Influence and Homework	37
2.5.4	Conclusion	39
2.6	<i>Student Mental Health and Covid-19</i>	40
2.6.1	Mental Health and Student Well-being	40
2.6.2	The Covid-19 Pandemic	42
2.7	<i>Relation of the Study to the Wider Literature and Research Questions</i>	45
3	Methods	47
3.1	<i>Introduction</i>	47
3.2	<i>Research Design</i>	47
3.2.1	School context and demographic	48
3.3	<i>Pilot Studies</i>	50
3.3.1	Lessons from the Pilot	50
3.4	<i>Participants</i>	53
3.4.1	Participants – Students	53
3.4.2	Participants – Teaching Staff	54
3.4.3	Access and recruitment of participants	54
3.4.4	Consent for Participation	55
3.5	<i>Data Generation Methods</i>	58
3.5.1	Psychometric testing of students	58
3.5.2	Purpose, design and validation of new SRQ-A items	61
3.5.3	Focus groups with students	63
3.5.4	Semi-structured interviews with teaching staff	65
3.6	<i>Methods for Data Analysis</i>	66
3.6.1	Descriptive statistics from the SRQ-A	66
3.6.2	Inferential statistics from the SRQ-A	70
3.6.3	Reliability and validity of SRQ-A quantitative data collection	74
3.6.4	Latent Thematic Analysis of Focus Group Data	75
3.6.5	Triangulation of data from SRQ-A and student participant focus groups	78
3.7	<i>Ethical Considerations</i>	80

3.7.1	Dual Roles as Teacher and Researcher	80
3.7.2	Anonymity and Pseudonymity	81
3.7.3	Reflexivity and Influence on findings	82
3.7.4	Ethical Guidelines	83
3.8	<i>Conclusion</i>	85
4	Target Grade Affinity and Autonomous Motivation Levels	86
4.1	<i>Introduction</i>	86
4.1.1	Introduction	86
4.1.2	Internal Consistency and Normality of Data	86
4.2	<i>Target Grade Affinity Index (TGAI)</i>	89
4.2.1	Measurements of TGAI	89
4.2.2	Change in TGAI over time	93
4.2.3	Summary	94
4.3	<i>Relative Autonomy Index</i>	96
4.3.1	Measurements of RAI	96
4.3.2	RAI dependence on mean target grades	99
4.3.3	Change in RAI over time	100
4.3.4	Summary	100
4.4	<i>TGAI relationships with other measures</i>	102
4.4.1	Relationship between mean target grade and TGAI	102
4.4.2	Relationship between RAI and TGAI	104
4.4.3	Multiple Linear Regression for TGAI, RAI and mean target grade	105
4.4.4	Summary	106
4.5	<i>Motivation Types</i>	108
4.5.1	Measurements of Motivation Types	108
4.5.2	Change in Motivation Type Over Time	110
4.5.3	Summary	113
4.6	<i>Conclusion</i>	115
5	Pupil Perspectives on Target Grade Use	117
5.1	<i>Students' perspectives on target grades</i>	119
5.2	<i>Alternatives to target grades</i>	128
5.3	<i>Lack of autonomy through pressure and control</i>	134
5.4	<i>Relatedness through collaboration and competition</i>	137

5.5	<i>Reduced autonomy beyond the classroom</i>	143
5.6	<i>Reduced relatedness through difference of experience</i>	147
5.7	<i>Factors hindering progress and success</i>	151
5.8	<i>Changes over the year</i>	155
5.9	<i>Other notable comments</i>	157
5.9.1	Perceived Competence as a Motivator	157
5.9.2	Enjoyment of learning and subject choice	158
5.9.3	Mental and physical health	159
5.9.4	Teacher comments	159
5.10	<i>Summary and Conclusion</i>	161
6	Discussion	163
6.1	<i>Introduction</i>	163
6.2	<i>Student Perspectives on Target Grades</i>	165
6.3	<i>Autonomy and Students' Alternative Goals and Motivators</i>	170
6.4	<i>Students' Lack of Autonomy</i>	174
6.5	<i>Relatedness through collaboration and competition</i>	179
6.6	<i>Factors hindering progress and success</i>	183
6.7	<i>Change Over Time</i>	187
6.8	<i>Triangulation & Summary</i>	189
6.8.1	Summary of triangulation	189
6.8.2	Summary	190
6.9	<i>Conclusion</i>	193
7	Conclusions	196
7.1	<i>Addressing the Research Questions</i>	196
7.2	<i>Limitations</i>	199
7.3	<i>Recommendations for Future Research</i>	201
7.4	<i>Recommendations for Schools Using Target Grades</i>	202
8	References	204
9	Appendix A – Participant Information Sheets	216

<i>A1 Student Participant Information Sheet</i>	216
<i>A2 Teacher Participant Information Sheet</i>	220
10 Appendix B – Data Collection Tools	223
<i>B1 Self-Regulation Questionnaire – Academic Items</i>	223
<i>B2 Focus Group Planning Sheets</i>	225
<i>B3 Teacher Interview Question Sheet</i>	228
11 Appendix C: Approved Ethics Form	230
12 Appendix D: Statistics Summary Tables	250
<i>D1 Internal Consistency and Reliability</i>	250
<i>D2 Descriptive Statistics</i>	251
<i>D3 Inferential Statistics</i>	253
<i>D4 Motivation Type Tie Distributions</i>	254
<i>D5 Motivation Type Distribution by Random Seed, and Statistical Difference Between Tests</i>	255
<i>D7 Visual Comparison of Motivation Type Distribution by Tie-Breaking Method Test, Including Sorting by Most and Least Autonomous Motivation Type</i>	xiii
<i>D8 Proportion of students associated with each grouped motivation category through the year</i>	xiv
13 Appendix E: Visualisations of Data Collected	xv
<i>E1 Histograms of RAI values</i>	xv
<i>E2 Q-Q Plots for RAI values</i>	xv
<i>E3 Histograms of TGAI values</i>	xvi
<i>E4 Q-Q Plots for TGAI values</i>	xvii
14 Appendix F – Code for Analysis in R	xviii

List of Figures

Figure 2.1 - Model of different forms of motivation according to SDT (Gagné & Deci, 2005, p. 336)	11
Figure 4.1 - Boxplot showing the distribution of TGAi values for year 10 students following the first SRQ-A.....	89
Figure 4.2 - Boxplot showing the distribution of TGAi values for year 10 students following the second SRQ-A.....	90
Figure 4.3 - Boxplot showing the distribution of TGAi values for year 10 students following the third SRQ-A	91
Figure 4.4 - Histogram of the mean Target Grade Affinity Index for Year 11 students over the year.....	92
Figure 4.5 - Histogram of the mean Target Grade Affinity Index for Year 10 students over the year.....	92
Figure 4.6 - Boxplot of summary statistics for Relative Autonomy Indices from the first SRQ-A round of data collection	97
Figure 4.7 - Boxplot of summary statistics for Relative Autonomy Indices from the second SRQ-A round of data collection	97
Figure 4.8 - Boxplot of summary statistics for Relative Autonomy Indices from the third SRQ-A round of data collection	99
Figure 4.9 - Scatter plot showing the distribution of mean target grade across all subjects compared to the mean TGAi value for students in year 11	103
Figure 4.10 - Scatter plot showing the distribution of mean target grade across all subjects compared to the mean TGAi value for students in year 10	103
Figure 4.11 - Scatterplot showing the relationship between mean TGAi against mean RAI values for each year 11 student through the year	104
Figure 4.12 - Scatterplot showing the relationship between mean TGAi against mean RAI values for each year 10 student through the year	105

Figure 4.13 - Grouped bar chart showing the proportion of student aligning with each motivation type at each data collection point in the year	110
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Figure 12.1 - Grouped bar chart showing the proportion of student aligning with each motivation type at each data collection point in the year. Repeat of Figure 4.13.....	xiii
--	------

Figure 12.2 - Bar charts showing the proportion of students aligned with each grouped motivation type (autonomous vs controlled vs amotivated) at each data collection point. .	xiv
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List of Tables

Table 0.1 - List of key terms	x
Table 0.2: Summary of Education Timeline	xi
Table 3.1 - Proportion of students in the whole study with each flag	53
Table 3.2 - Proportion of students in the focus groups with each flag	53
Table 3.3 - List of Aliases	54
Table 3.4 - Chi Square values demonstrating the (lack of) statistically significant difference between distributions of students among tied motivation types	70
Table 3.5: Summary of the inferential statistics used for hypothesis testing in response to the research questions, to be triangulated with qualitative data for analysis	72
Table 3.6: Details of potential ethical issues, and the preventative actions taken to ensure alignment with ethical guidelines.....	84
Table 4.1 - Table of skew, excess kurtosis, Shapiro-Wilk statistic and associated p-value for mean RAI and mean TGAI values for both year groups	87
Table 4.2 - Table of summary statistics relating to students' Relative Autonomy Indices from the first SRQ-A round for their respective Year Groups	96
Table 4.3 - Table of summary statistics relating to students' Relative Autonomy Indices from the second SRQ-A round for their respective Year Groups	97

Table 4.4 - Table of summary statistics relating to students' Relative Autonomy Indices from the third SRQ-A round for their respective Year Groups	98
Table 4.5 - Motivation type distribution at the first data collection point.....	108
Table 4.6 - Motivation type distribution at the second data collection point	109
Table 4.7 - Motivation type distribution at the third data collection point	109
Table 4.8 - Results from Stuart-Maxwell tests conducted per year group at each point in the year, for each random seed test for distributing students with ties	112
Table 12.1: Calculated values for Cronbach's Alpha for each motivation type for each year group during each data collection round, with mean values	250
Table 12.2 - Summary of TGAi values through the year for each year group, change between each point in the year, and skew and excess kurtosis.....	251
Table 12.3 - Summary of RAI values through the year for each year group, change between each point in the year, and skew and excess kurtosis.....	252
Table 12.4 - Spearman Rank Correlation Coefficient (SRCC) and linear regression gradients (LinReg Grads) for the relationship between RAI and TGAi	253
Table 12.5 - SRCC and linear regression for TGAi dependence on mean target grade, with associated p-values.....	253
Table 12.6 - SRCC and linear regression for RAI dependence on mean target grade, with associated p-values.....	254
Table 12.7 - SRCC and multiple linear regression for TGAi dependence on mean target grade and mean RAI value, with associated p-values	254
Table 12.8 - Left: Motivation type ties for both year groups together at each point in the year. Right: Tables showing the number of 3+-way ties and the number of combinations of motivation type	254
Table 12.9 - Number and proportion of students aligned with each motivation type at each point in the year (with mean values for conclusions), for each random seed method of distributing students with motivation type ties, and the associated Chi Square tests.....	255

List of Context Boxes

Box 1.1 - Target grades influencing predicted grades	3
Box 1.2 - Target grades as a widespread phenomenon	6
Box 2.1 - Explanation of the structure of GCSE qualifications in the sciences	19
Box 2.2 - How setting students in ability-based groups worked at the study school .	24
Box 2.3 - Increased academic research use for teaching practice at the study school and beyond	45
Box 3.1 - Study school's aim for P8 score	49
Box 3.2 - Time allowed for students to complete the SRQ-A	60
Box 3.3 - Consent from school leadership for the study	80
Box 5.1 - Explanation of chapter 5 context boxes	117
Box 5.2 - Compulsory intervention and re-sitting assessments	120
Box 5.3 - Students with English as an additional language and their target grades .	121
Box 5.4 - Teachers' knowledge of students and their aptitude	122
Box 5.5 - Students' awareness of target grades' origins.....	123
Box 5.6 - Teachers' use of target grades, and students' awareness of their use	125
Box 5.7 - Target grades as aspiration.....	126
Box 5.8 - Aspiration provided for students.....	130
Box 5.9 - Entry requirements for continued education at the separate-site KS5 at the study school	131
Box 5.10 - Context for target vs predicted grades on student progress reports.....	132
Box 5.11 - Mental health support for students at the study school.....	135
Box 5.12 - Social pressure and competition in the classroom.....	139
Box 5.13 - Setting at the study school and how subject departments used target grades	141

Box 5.14 - Emphasis on extra-curricular for a well-rounded education, versus workload and time pressure	144
Box 5.15 - Context around participant behaviour in the classroom	147
Box 5.16 - Study school professional development on feedback.....	148
Box 5.17 - Education provision during the pandemic at the study school	151
Box 5.18 - Homework policies at the study school.....	153
Box 5.19 - Target grades as demoralising?	160
Box 6.1 - Competition following assessments in my classes	180
Box 6.2 - Professional development and school culture at the study school.....	185

List of Terms

Term	Description
The School	The school where the study was based; all teacher and student participation has taken place within this school.
Parents	When the terms parent or parents are used, they certainly include the parents of a student, but are also meant to encompass any guardianship or other adults that hold responsibility for caring for a student.
Motivation	The reason for which someone completes, or attempts to complete, a specific activity, in line with self-determination theory (SDT). See section 2.2.1.
Grades	Definitions for ‘target grades’, ‘current grades’ and ‘predicted grades’ are all given in section 1.2.1.

Table 0.1 - List of key terms

Key Stage	Year groups included	Ages of pupils	Assessment at the end of the key stage
Key Stage 2 (KS2)	Years 3-6	7-11 years	Standard Assessment Tests (SATs) examinations in English and Maths only, sat by all students nationally
Key Stage 3 (KS3)	Years 7-9	11-14 years	Internal only – decided by individual schools
Key Stage 4 (KS4)	Years 10-11	14-16 years	General Certificates of Secondary Education (GCSEs), or other Level 2 qualifications
Key Stage 5 (KS5)	Years 12-13	16-18 years	Advanced (A) levels, or other Level 3 qualifications

Table 0.2: Summary of Education Timeline

1 Introduction

1.1 *Background, Context and Aims*

In my seven years working in three secondary schools in England, including as a trainee teacher, all three schools used target grades with Key Stage 4 (KS4) students as a method of motivating students regarding their academic work and effort. Students may be told to aim to meet or exceed their target grades, mirroring the targets that adults may be set in their professional roles, and mirroring the minimum attainment-based targets set for schools by the government from 2002 (Chitty, 2009; DfES, 2001). However, it is unclear whether the use of target grades as an extrinsic motivator is effective in this goal or not. My anecdotal experience with students indicated that there were few students who found these helpful and some students who found the use of target grades to be actively demoralising.

This study took place in a secondary school in the southeast of England, with data collection taking place in the 2022-2023 academic year. Beyond the initial justification for the study below, there is a range of literature that relates to students' academic motivation in general in chapter 2 Literature Review. This is accompanied by further information about government policy and assessment practices in England over the last 40 or so years, and an explanation for the theoretical basis for the study. Additionally, more context for the study school is provided in chapter 3 Methods. Then, the quantitative and qualitative findings are presented in chapters 4 and 5 respectively. Following this is chapter 6 Discussion, outlining how the findings relate to existing literature, and finally chapter 7 Conclusions, where the research questions are explicitly addressed, along with consideration of some limitations of this study.

Boxes such as these, known as 'Context Boxes', provide contextual information based on my professional knowledge of the study school, the participating students and teachers, and the practice of target grade use. They can be found primarily in chapter 5, Pupil Perspectives on Target Grade Use, but also elsewhere in the thesis. Subsequent context boxes include a caption such that they can be referred to elsewhere in the thesis.

1.2 What are target grades?

1.2.1 Types of Grades

Students in the study school were exposed to three primary grade types in relation to their work (and these grades all follow the 9-1 scale that GCSE qualifications are based on). Each time students at the study school completed a round of assessments across their subjects, they were provided with a one-page report that showed all three types of grades. The first of these was the 'current grade', which showed the grade the student was awarded based on the assessment they had just completed in that subject. Each curricular department likely used slightly different methods for arriving at the grade for this work, but since most of these assessments would be either directly from or based on prior year public examination papers, most frequently the grades awarded would be based on the grade boundaries provided for individual exam papers. 'Public examinations' refers to the examinations that were issued by the exam boards; schools may have used the most recent examinations for mock examinations to generate 'current grades'. The box showing the current grade in the table on the report was colour-coded to visually demonstrate how close the current grade was to the student's target grade.

The second type of grade students would be able to see was their 'predicted grade'. This grade used a combination of the 'current grade' and a teacher's professional and personal knowledge of the student to predict which grade the student was likely to achieve at the end of their GCSE course. Since there was no central guidance for how to arrive at a predicted grade provided to the teaching staff, curricular departments likely had marginally different methods for doing this, and teachers decided these and submitted them to be included on the report.

Finally, the target grade students had been provided for each subject would also be visible on the report, and this aimed to be a grade the student should have aimed to achieve by the end of their course. In the Science department, depending on the time remaining before the examination period, predicted grades would usually not exceed more than two grades above the current grade, though would often equate to one grade of progress. For example, a student with a current grade of 6 would usually expect a predicted grade in the 6 to 8 range.

In my department leadership role during the study, I collated student assessment data to generate current grades, and provided details for teachers about filling in 'grade collections' (i.e. the process of inputting data so that the reports could be generated for each student. My role related primarily to the logistics). Guidance for predicted grades within the department usually followed the guidance that was described above, however, at one point it was suggested by a department leader that I should hide the students' target grades from the spreadsheet where the current grades were collated. The two of us were suspicious that the aspirational target grades were subconsciously pushing teachers to inflate their predictions unnecessarily for some students. For example, a student with a current grade 4 would usually expect a predicted grade of 4 or 5, depending on their teacher's perception of the student's work ethic. Alternatively, if a teacher then saw that this child's target grade was a grade 8, they may be more inclined to increase the predicted grade from a 5 to 6, and in rare cases perhaps a 7. Further, in the case of a student with a target grade 8 that had earned a grade 9 in an assessment (representing the current grade), the teacher may be reluctant to provide a prediction of a 9 since this exceeded the target grade, even if the student had demonstrated they can achieve a grade 9.

Box 1.1 - Target grades influencing predicted grades

1.2.2 Target Grade Generation

Target grades were calculated using software that used students' KS2 SATs data (made up of English and Mathematics), combined with CAT4 data collected early in Year 7 (where CAT4 stands for Cognitive Abilities Test, fourth edition). The CAT4 tests assessed students' numerical and literary reasoning skills, reasoning with shapes and designs and mental manipulation of shapes (GL Education, 2025), and the SATs exams assess reading comprehension, grammar, punctuation and spelling, and arithmetic and mathematical reasoning. Students' SATs results are widely seen as a reasonable predictor of KS4 outcomes, more so than other measures (Leckie & Goldstein, 2017).

Target grades, at the school where this study took place, used several pieces of data in their generation. This included prior attainment (or students' KS2 SATs results; Leckie & Prior, 2022) and data from tests sat at the beginning of year 7. After this, the leadership team and Heads of Departments would then pass through the target grades and change the targets where their professional knowledge suggested that it was necessary based on pupil identifiers

such as SEN, PP or EAL markers. Where the leadership team felt the targets needed increasing, they were more likely to do increase the target grades for female students, given the historical outperformance of female students over male students. Further, it was a somewhat open secret that the generated target grades would be increased for some students in order to increase the estimated Progress 8 score the school would achieve were those targets all to be met.

It seemed as though for a significant portion of the student body; the grades would be increased from the generated grade. Target grades were, on the occasion they were referred to by senior leaders at the school, often referred to as ‘aspirational’. The consideration of the target Progress 8 (Department for Education, 2014; Perry, 2016), which depends on the progress each student makes between KS2 and KS4 compared to the average progress a student with the same KS2 scores makes in the same time frame, suggested that students should expect to make a certain amount of academic progress by the end of their GCSE courses, and the school deliberately increasing the targets acts as a way to push the students to attempt to exceed their expected progress.

The closest reference found in literature to target grades (as defined earlier) is the reference to the grades students may be predicted to achieve given their academic and socioeconomic backgrounds:

“Ex ante predictions are typically based on the average progress of all pupils who shared the same initial level of attainment. Predictions may control for pupil characteristics which, on average, are associated with rates of progress. Alternatively, contextual associations may be ignored on the grounds that these embed low expectations for disadvantaged pupils.”

(Perry, Davies & Qiu, 2018, p. 141)

This description of where students may be predicted to finish their GCSE courses mirrors the description from Michael (February 2023). Even where target grades may stem from this statistical expectancy, the lack of literature means it is unclear at what point schools started using these calculated predictions as targets that were shared with students, nor whether they are effective at motivating pupils or supporting whole-school outcomes. One could hypothesise that the inflation of these predictions to account for the school’s built-in aspiration occurred around the same time as the introduction of these predictions as targets.

1.2.3 Origin of Target Grades

There is a distinct paucity of literature about target grades relating to their origin or their use in English secondary schools. The way that the education system works in England is outlined in more detail in chapter 2 Literature Review, and it is hypothesised that the use of target grades became more prevalent as competition between schools became more common. It may also be possible that they stem from the statistical expectancy for where students may finish their GCSEs given their KS2 results (Leckie & Prior, 2022; Gregory & Huang, 2013; Perry, Davies & Qiu, 2018). Further, despite being so common, there is a lack of consensus on their usefulness and what they are for. Given the context above, it is most likely that they are used as an extrinsic method of motivating students such that they aim to meet or exceed the target grade. Depending on the method of use by teachers, for example by using ‘fear appeals’ (Putwain & Symes, 2011a), the specific type of (likely extrinsic) motivation a student is likely to experience due to target grade use may vary considerably. For example, teachers who use it as a minimum benchmark for students to attempt to meet in assessments and subsequently use sanctions or re-assessment of students for missing the target grade, students are likely to experience external motivation. Other teachers who used the target grades to show how achieving certain grades may be helpful may also support identified motivation in their students. Motivation types that students may experience are additionally outlined in more detail in the Literature Review.

It is unclear where, when or how target grades came to be such a ubiquitous feature of secondary school progress measurement, though it seems as though target grades were introduced several years after the 1992 introduction of school league tables (Dearden & Vignoles, 2011); see section 2.3 for more detail on this. Having spoken to more seasoned teachers at the study school, none could identify when target grades first appeared. Whilst I was studying my own GCSEs (2010-2012), I was issued a ‘Minimum Expected Grade’, and this was used in a similar way to how the current target grades are used. At some point between completing my GCSEs and starting to teach, these became known as ‘target grades’, despite serving a similar purpose in providing students with a grade to aim to meet (or exceed). Outside of these periods of time, these targets may have had other names. Despite being around 200 miles away, target grades were used in a similar way to that

described above at the schools I completed my teacher training in, and there was regular debate on their usefulness on the social media platform X (formerly Twitter) among teachers.

Box 1.2 - Target grades as a widespread phenomenon

1.3 Justification and Aim for the Study

The lack of literature about the origin or use of target grades despite their widespread use in English secondary schools supports the justification for investigating the efficacy of target grades as a motivational tool. In addition, perhaps unsurprisingly, there is no literature to indicate the extent to which target grade use by schools affects students' attainment in their GCSEs (or other academic qualifications). However, given the target grade generation process described earlier, it is likely that target grades are based on students' likely attainment, so investigating whether there is a correlational relationship would not necessarily indicate any degree of causation.

There is literature that focuses on motivation of students at the secondary level, including relating to factors that affect both intrinsic and extrinsic forms of motivation. There is also literature that may give some context about the background of target grades given the statistical expectancy for students' outcomes at KS4. However, there is a lack of literature relating to target grade use in schools as a motivational tool, even if it is statistically possible to see where students *may* finish their GCSEs. This presents a problem in that one could argue that there is a lack of theoretical basis for their continued use, and commentary on social media among communities of teachers (for example X, formerly Twitter), suggests that the practice is relatively common in secondary schools in England.

Self-determination theory (SDT), which will be described in more detail in the next chapter, describes the types of motivation that students experience on a scale from autonomous to controlled (Gagné & Deci, 2005; Ryan & Connell, 1989). Increased intrinsic (autonomous) motivation is associated with improved academic outcomes (Howard et al., 2021). Yet, target grades may represent a lack of autonomy in students' decisions about grades to aim for. Depending on their use by teachers, they may also hinder students' perceptions of their own competence (were they to miss the target grade that had been

calculated for them). As such, it is important to discern whether target grades are motivational for students or if, as some students indicated when I was conducting data collection for the dissertation of my Master's degree, they are demoralising and encourage a reduction in perceived competence. In the case that target grades are not inducing autonomous forms of motivation, but rather controlled forms of motivation (or in some cases, perhaps amotivation), then one could question whether it is worth continuing the practice, or whether other methods of motivating students may be more worthwhile. In the case that target grades are actively demoralising, then this introduces ethical issues with their continued use. This thesis does not aim to discern precisely the origins of target grades, but rather to examine whether students are academically motivated by those target grades, even if those target grades do in fact stem from the statistical likelihood of achieving the target grade.

The Literature Review in the next chapter outlines various factors that affect students' intrinsic and extrinsic motivation, considering the extent to which each type of motivation is autonomous or controlled. The use of the methods described in chapter 3 invited rich data from students, both quantitative and qualitative. These data revealed a range of perspectives students held regarding their target grades and a variety of experiences around how teachers used target grades. These perspectives, collated with statements by teaching staff and the quantitative data students provided addresses the research questions to draw conclusions about the suggested fate of target grade use.

2 Literature Review

2.1 *Introduction*

One of the functions of a target grade in schools is to motivate students to engage in academic work such that they may reach that target grade by the time they finish their GCSE qualifications at the end of year 11. The use of target grades has become ubiquitous in one form or another in secondary schools across England. However, the lack of academic literature to support or oppose their justification or usage is problematic. As state-funded education has become more marketised starting in the 1980s under the Thatcher government (Hartley, 2008; Seddon, 1997) and continued by subsequent governments (Dearden & Vignoles, 2011; Tomlinson, 2001), through increased power of school choice by parents for their children, and competition through for example the continued publication of school-wide performance statistics on nationally published league tables means schools are under additional pressure to ensure their students make substantial academic progress.

Building on the contextual information in chapter 1 Introduction about how target grades are currently used in schools (with particular focus on the case study school), this chapter firstly explains the appropriateness of self-determination theory as a theoretical basis for this study. Subsequently, literature about the education system in England has evolved over the last four decades with regard to curriculum and assessment is briefly reviewed, providing a potential explanation for the origin of target grades as they are used currently. Given that target grades may act as an extrinsic motivator, the following two sections of this chapter address other potential motivators that schools may make use of, including intrinsic and extrinsic motivation respectively. Penultimately, there is consideration of how students' mental health and well-being, and the Covid-19 pandemic, may have (or continue to) affect students' academic motivation and outcomes. Finally, the relevance of the literature reviewed for this particular study is addressed before outlining three main research questions that this study focused on.

2.2 *Self-Determination Theory*

2.2.1 Self-Determination Theory

There exist a range of theories in education that aim to explain why students are motivated and how they are motivated, different types of motivation students may experience, as well as theories that attempt to improve that motivation toward a particular (e.g. academic) goal. These include theories addressing the goal structures that students build, broad factors that may impact the motivation that a student experiences such as one's competence, autonomy, or relatedness to their peers (Ryan & Connell, 1989; Gagné & Deci, 2005; Howard et al., 2021), as well as factors both inside education as well as outside, that may affect student motivation and attainment. The term 'motivation' can be considered one's "reason for acting" (Ryan & Connell, 1989, p. 749), i.e. why they (attempt to) complete a task. In this section, self-determination theory is outlined and evaluated in the context of students' academic motivation in schools, and there is justification for why self-determination theory (SDT) was chosen as the basis for this study.

SDT is a motivational theory that attempts to *explain* the reasons that a person might be motivated to do or achieve something, going beyond simply *what* motivates that person. This theory requires the motivation to place the (un-)motivated person at the centre of their motivation, where motivation is intrinsic, the motivation originates with them (Bureau et al., 2022). While the theory has applications in the field of psychology, in this thesis the focus will be on its use in the field of education. SDT has been shown to be effective at describing the effects on achievement in school as a result of different motivation types (Bureau et al., 2022; Howard et al., 2021; De Bilde, Vansteenkiste & Lens, 2011), and various outcomes in schools, referring to academic achievement, or perhaps improvement of particular skills. Skills learned in schools may include 'academic' skills like analysis of a source of information for example when studying History or English, 'practical' skills including use of tools or equipment such as when studying Design and Technology or Science, or skills to improve performance in sport for example in Physical Education.

The theory was initially developed in the 1980s, culminating in a more concrete motivation theory in the late 1980s (see Ryan & Connell, 1989; Deci & Ryan, 1985). For example, after initially focusing on intrinsic motivation (Ryan & Connell, 1989), distinguishing between internal and external factors has "been crucial for ... perceived autonomy" as well

as “both interpersonal attribution processes and issues of self-perception” (Ryan & Connell, 1989, p. 749). This introduction to the idea of internalisation of motivators refers explicitly to the effect that the autonomy one experiences might have on motivation, as well as ‘self-perception’, which implies the importance of one’s feeling of competence, and its effect on motivation. In the pair of studies conducted by Ryan and Connell (1989), the authors proposed four categories of reasoning within behaviour, with particular reference to motivation, and the importance of autonomy perceived by the one who is or is not motivated. These categories were labelled as *external*, *introjected* and *identified* and *intrinsic* motivation. The studies, testing this model of the relation between autonomy and motivation yielded positive results, successfully predicting a relationship between the range from intrinsic to external motivation, perceived control, and separately, a “positive relatedness to significant others” (Ryan & Connell, 1989, p. 760; see also Harter, 1981; Connell, 1985; deCharms, 1976). These later led to the development of SDT as we know it now, focusing on the importance specifically of autonomy, competence and relatedness to affect the extent to which motivation is intrinsic, external, non-existent, or somewhere in between.

Whilst the Ryan and Connell study acknowledged that the pair of studies conducted in 1989 were not sufficient to confirm the relationship between the different factors mentioned, and motivation, Gagné and Deci (2005), amongst others, have developed models like that in Figure 2.1 below. The four categories originally proposed can all be identified in order from lack of all motivation (i.e. amotivation) up to intrinsically autonomous motivation. In addition, this model demonstrates the distinction between autonomous motivation and controlled motivation, whereby autonomous motivation indicates that the motivation arises (at least in significant part) from the autonomy one experiences, whereas controlled motivation suggests motivation as a result of control from an external source.

“Students experiencing autonomy perceive that they are engaging in learning tasks freely and voluntarily, without perceived coercion. Students experiencing competence are confident that their actions are impactful in shaping their academic experience. Students experiencing relatedness feel connected with important others in their school (e.g. teachers, friends)”

(Bureau et al., 2022, p. 3)

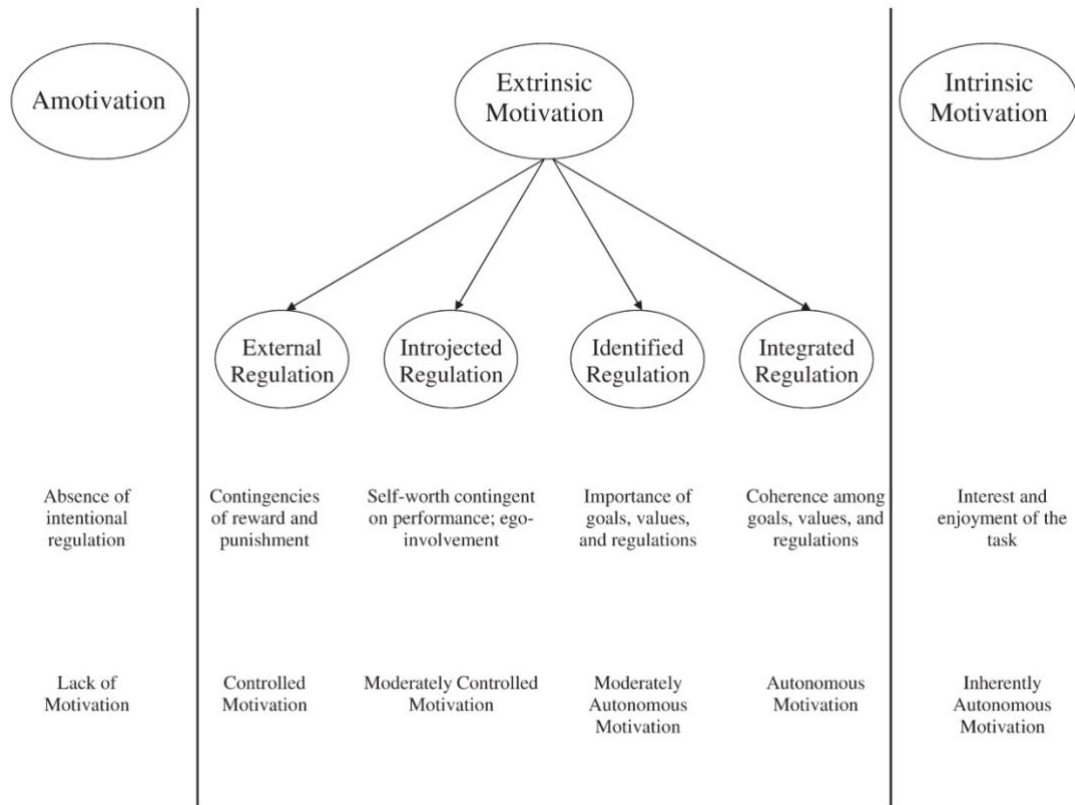


Figure 2.1 - Model of different forms of motivation according to SDT (Gagné & Deci, 2005, p. 336)

The succinct definitions given by Bureau et al. (2022) in the above quote clarify the meanings of each strand that will be used throughout this thesis (i.e. autonomy, competence and relatedness). In addition, the diagram above shows a visual representation of the scale upon which motivation can be considered autonomous, while external motivation is considered to be entirely controlled (or not autonomous) and without genuine acceptance of the regulation. Introjection can be described as regulation that “has been taken in by the person but has not been accepted as his or her own” (Gagné & Deci, 2005, p. 334). This means that the person experiencing the motivation may connect this type of regulation to their own egos (deCharms, 1968; Gagné & Deci, 2005), i.e. someone exhibiting introjected motivation may want to protect their own ego. Identified regulation means that one may feel an increased level of control of their goals and can identify congruence between the goal or attribute set by the external motivation source and their own goals or attributes. For example, a student may have been issued a target grade for English Language at grade 6 and can recognise that to be allowed to continue to study A-level English Language, they will require a grade 6 so will accept the goal. Finally, integrated regulation considers someone to have not only have accepted a goal from an external source, but to have allowed the regulation to

become part of their personality or identity in that context. In this case, the student with the target grade 6 may consider this once-external goal to be a key factor in the attitude they bring to physics lessons, and the additional work they do outside of the physics classroom to continue with their study beyond the end of KS4. Given that integrated motivation is not directly addressed in the research tools used in this study (nor is it acknowledged by a range of literature; for example see Howard et al., 2020), based on the 'self-regulation questionnaire – academic' (SRQ-A) (Ryan & Connell, 1989), integrated motivation is not considered further in this thesis. It should be noted that regardless of the *reason* for a student's motivation, target grades will always be considered an extrinsic motivational tool given the requirement of students to work toward the target as its own "separable outcome" (Ryan & Deci, 2000, p. 55).

In all, SDT can be considered a continuum that describes the extent to which a student's academic motivation can be considered autonomous, and along that scale are categories of motivation. Each category represents a motivation type, each with varying degrees of autonomy, determining their order on the autonomy-control scale. These motivation types are additionally defined by characteristics that consider students' perceptions of their own competence, as well as the extent to which they feel relatedness with important others. For example, identified motivation can be considered autonomous but still extrinsic (determining its place on the scale), due to being defined by the alignment of the extrinsic motivator with the student's own values toward education and what they deem important. Where data relating to students' academic motivation are collected using the Self-Regulation Questionnaire – Academic (Ryan & Connell, 1989), the use of the Relative Autonomy Index (RAI) demonstrates the extent to which a student's motivation is autonomous, and the categorisation of students into motivation types describes characteristics of those students' academic motivation beyond simply the extent to which it is autonomous (Howard et al., 2021).

SDT has been deployed in fields outside education where this is an element of psychology, such as business and healthcare, in addition to its strengths in demonstrating its efficacy in describing students' motivation types in education. The development of the theory to focus on the three strands (autonomy, competence, relatedness) not only provides a theoretical framework to explain the type and level of motivation a student may experience,

but may also be helpful for teachers to develop their own classroom practice such that they are more able to tailor their teaching to the students by accounting for these factors, which one could argue is a key aim of education research. The next section examines some of the ways in which SDT has been applied to education-focused contexts.

2.2.2 Uses of SDT in Education Research

Over time, there have been a number of applications of SDT in education. For example, in a meta-analysis conducted by Bureau et al. (2022), they showed that an improvement in any one of the three strands (autonomy, competence or relatedness) was positively linked to an increase in self-determination in an education context, based on 144 studies. In addition, it was found that a feeling of *competence* was deemed the most significant of the three strands for contributing to self-determination, and relatedness the least effective. In a classroom setting there is likely little that a teacher could do about the relatedness that students experience with each other. However, the increased effect of perceived competence in an activity may be an easier factor for class teachers to control to improve the motivation of their pupils, for example by using more positive language (Smith et al., 2018). Despite the compelling arguments and supporting data provided by this meta-analysis, the detail of the screening process for article inclusion shows that Bureau et al. (2022) did not include any articles without antecedents. This decision was not explained in the article, and so it is unclear exactly what the authors considered to be antecedent or whether they included any original work on the subject.

Another meta-analysis of applications of SDT to education contexts, Howard et al. (2021) synthesised 344 samples of data to examine the impact of students' primary alignment with different motivation types affects their academic outcomes, and their well-being. Regarding the different motivation types defined by SDT, they identified "nuanced findings reflecting the specific characteristics of [the] motivation types" (p.1317). For example, they concluded that the students who most prominently aligned with identified motivation were most likely to demonstrate persistence, as well as generally demonstrating better academic performance due to the increased self-determination students experienced. They attributed this in part to the benefit of identified motivation applying regardless of whether the student found the work they were doing interesting or not. Conversely, students experiencing more controlled forms of motivation, overall, tended to demonstrate worse academic outcomes,

as well as other negative consequences such as worsened well-being or increases in anxiety; this applied primarily to external motivation as well as introjected motivation, though to a lesser extent with the latter. Ryan et al. (2022) similarly conducted reviewed a series of meta-analyses, focusing on the use of SDT in education and beyond. In line with the other meta-analyses referred to here, they further found that more autonomous forms of motivation, again also considering the characteristics associated with those forms of motivation, tended to relate to more positive academic outcomes. Finally, there is a range of studies that examine the extent to which students experience autonomy, competence and relatedness as it relates to need support from their teachers. Where teachers engage in more need support practices, such as explaining the reason that a task is important or helpful for students or work to provide choices to students, the students experienced increased autonomous motivation and perceptions in their own competence (Van den Berghe et al., 2012), and this was most consistent when the teachers themselves had autonomy (Soenens et al., 2012).

The meta-analyses and literature reviews referred to here covered a range of applications of SDT to education contexts. While SDT has been applied to teaching practice, the student-focused examples largely focused on how autonomy need support supported students' academic motivation, and how different degrees of their autonomous motivation affect academic outcomes. The use of target grades may affect students' motivation in a range of ways, and the next section outlines therefore the ways in which SDT is an appropriate theoretical framework for this study.

2.2.3 SDT and the present study

As discussed in the introductory chapter, this study aims to determine whether target grades are useful as an extrinsic motivational tool. When considering which motivation theory to base this study on (including SDT or one of the many other motivation theories available), there are likely to be many factors that affect a student's motivation, whether that is type or amount, or both. All of these factors will need to be considered, and the type of goals or motivation that may be induced using target grades in particular is of paramount importance for this study.

SDT and its associated measurement tools (outlined in the Methods chapter), provide not only a statistic to describe the extent to which a student is autonomously motivated, but also further explanation for *why* a student is academically motivated in the way that they are

(or, perhaps in some cases, are not). This provides the opportunity to consider a range of factors that affect students' intrinsic and extrinsic motivations for their academic work. Students likely align primarily with a single motivation type, but the descriptions of the characteristics of each motivation type allow for nuance in what does or does not academically motivate the students across more than one of the motivation types. The nuance in the motivation type characteristics additionally allows for some exploration of how students experience relatedness with important others, as well as how they perceive their own competence. Students' experiences of target grade use will relate to all three strands of SDT (autonomy, competence and relatedness), and additionally can relate to the characteristics of each motivation type. As such, SDT provides an appropriate theoretical framework to consider the wider academic motivation of pupils, and more specifically, the use of target grades as a motivational tool.

2.3 *Marketisation of Education and Measuring School Efficacy*

Regardless of how one perceives the efficacy and appropriateness of the current system in England for issuing qualifications, like GCSEs, the vast majority of school subjects are mostly assessed by summative examination(s) at the end of the course, and the data from these assessments is used to generate statistics on schools' performance overall. Both the methods of assessment for students and the ways in which school performance is measured have changed since the introduction of GCSEs. This section provides additional context relating to how measurement of school performance has changed over time, and how assessment structure has changed over time too. This is provided with a view to the potential origin of target grade use by schools, building on section 1.2.3 in the Introduction chapter, as well as explaining why schools would be interested in individual students' academic attainment, progress, and therefore likely their academic motivation.

2.3.1 Government policy through time

England's education system has been comprehensive since around 1965-70 (Martin, 2020; McCulloch, 2016), entitling all pupils to the same education, rather than sorting students into different types of schools. This subsection outlines how government policy relating primarily to measurement of school performance, but also assessment of students in KS4, have changed over time. This subsection works under the assumption that the method for assessing students' academic progress (i.e. examinations) is unproblematic.

A significant reformation of the education system in England and Wales occurred in 1988 with the Education Reform Act (Chitty, 2009). The main aims of the Act were summarised as:

"Consolidating a market ideology to be achieved by parental choice, establishing central government control over curriculum and assessment, further eroding the powers and responsibilities of local authorities, teachers and their trainers, demanding accountability from individuals and institutions, especially the universities, and encouraging selection under a rhetoric of diversity."

(Tomlinson, 2001, p. 43)

As a method of attempting to achieve this, a common National Curriculum to be taught by all state schools was introduced, to be assessed at multiple points through

compulsory education, including at the end of KS4 through GCSEs which themselves had been introduced in 1986 (Chitty, 2009). The use of a common curriculum, and its assessment through a common method (i.e. GCSEs), allowed greater comparison of achievement between schools and therefore their pupils. Additionally, the increased emphasis on parental choice relating to where to send their children to school, leading to increased comparison (and perhaps competition), aimed to 'raise standards', with the first league tables for English secondary schools being produced in 1992 (Dearden & Vignoles, 2011). However, it was seen that the 'rankings' for secondary schools primarily reflected the prior attainment of the exam-year students at the point of intake, more so than any effect that the secondary school could have had (Dearden & Vignoles, 2011; Leckie & Goldstein, 2017). This in turn led to the introduction of new measures, initially 'Contextual Value Added' (CVA), later discontinued and replaced with 'current Expected Progress' (EP) (Leckie & Goldstein, 2011). The introduction of EP in 2011 (Leckie & Goldstein, 2017) led to schools focusing disproportionately on students on the borders between GCSE grades (i.e. the C/D border, latterly the 3/4 or 4/5 border) for intervention, and contains inherent bias towards higher ability students (Perry, 2016). Leckie and Goldstein (2017) further explained ways in which EP was not suitable beyond describing the academic position of students at the point of entry to secondary school. Finally, the introduction of a 'headline' progress figure, known as Progress 8 (P8) (Department for Education, 2014), presented more of the same issues that were faced by the similar previous academic progress indicators (Perry, 2016), despite its introduction to be a measure of the 'added value' a student makes due to being at a particular school:

Progress 8 tells you about the progress that pupils in a school make from the end of primary school to the end of year 11. It is a type of value-added measure, which means that pupils' results are compared to other pupils nationally with similar starting points.

(Department for Education Blog, 2022)

Perry (2016) argued that the UK government's replacement of EP with P8 removed the inclusion of variables that added context to student outcomes beyond prior attainment as a "political decision" (Perry, 2016, p. 1058). One could hypothesise that this increased emphasis on market forces or market ideology, along with the growing use of measures of progress and school-wide targets is similar to businesses that aim to meet targets (or 'key

performance indicators') related to growth, profit, or other performance-based metrics, though this is not explicitly supported by education-focused literature.

In 2001, the UK government of the time produced a White Paper that proposed changes to the education system in England and Wales that would eventually lead to the Education Act 2002 (Chitty, 2009). The White Paper had a focus on improving diversity in the education system through encouraging additional choice for parents about where to send their children to school, in part provided by the increased number of specialised schools, but also on the 'floor targets' that all secondary schools were supposed to meet by certain dates regardless of the catchment area or demographic of pupils that the school served. This builds on the marketisation of education described earlier (Tomlinson, 2001). For example, all schools were to have at least 25% of their students achieving five or more GCSE grades A* to C (Chitty, 2009; DfES, 2001). This attempt to improve education across the country means that students who were allocated to lower-performing schools were potentially going to be pushed to achieve higher grades by the end of their compulsory education (which at the time, was completed at the end of KS4). One could interpret this as an effort to remove the effect of socioeconomic advantage as a factor, even if this could only be partially achieved through this policy. Some support was outlined for the schools that struggled most to help achieve this, though beyond several references to *targeting resources* (DfES, 2001), little detail was given here despite in-depth detail of some of the challenges faced by pupils including speaking English as an additional language or students moving schools. The marketisation effort continued beyond 2010 (Holmwood, 2016) through increased parental choice and additional metrics for measurement of school effectiveness, for example the introduction of Attainment 8 and Progress 8, replacing EP and CVA. Additionally, since 2010, the academisation of state schools in England has led to reduced control of schools by local authorities, with more funding and direction coming from the central government (West & Yaghi, 2025).

As a result of the push on schools to improve their overall attainment by the government in 2001, particularly achieving set numbers of grades for their pupils (Gillborn & Youdell, 2000), in part due to the introduction of league tables mentioned previously (Leckie & Goldstein, 2017). Therefore, one could infer that this will have subsequently led to the increased use of Minimum Expected Grades (MEGs) with their pupils, however there is no

mention of schools using these school-wide targets to begin creating student-level target grades.

2.3.2 Current assessment structure

Despite some adaptations to the National Curriculum over the three decades since its original introduction to English education in 1988 it still stands as the main framework for curricula, and acts as a basis for GCSE specifications written by the various examination boards in England. (Note that the portions of the National Curriculum addressing key stages 1, 2, 3 or 5 are not acknowledged for the purpose of this study). The structure of the education system in England means that qualifications at the end of KS4 are often (though not always) required for students to gain entry to Level 3 qualifications, or other apprenticeships or training courses. As a result, these terminal examinations are considered high stakes (He et al., 2015). For example, the Physics A-level course at the participating school required students to have at least five GCSEs graded 9-5, including at least grade 7 in each of Mathematics and Physics (or 7-7 for Combined Science). These entry requirements are likely to vary between different further (and higher) education institutions.

GCSE Combined Science is a 'double award' qualification, meaning that students are awarded two GCSEs for the qualification. The grade boundaries for this qualification are set such that the two grades must either be the same or adjacent, using the total score of all six examination papers. For example, a student could achieve 7-6, 6-6, or 6-5, but not 7-5. GCSEs in Biology, Chemistry and Physics are worth one GCSE each, and are awarded a single grade as with other GCSE qualifications.

Box 2.1 - Explanation of the structure of GCSE qualifications in the sciences

Marshall and Gibbons (2018) compared the assessment systems between England and Canada, and noted that the English focus on exam-based assessments put additional pressure on both students and teachers that was not recorded to the same extent in Canada. The sample of teachers interviewed was small, and the authors acknowledge a lack of generalisability of their conclusions, though their teaching participants in England highlighted that the increased pressure led to a focus on exam technique and reduced the emphasis on engaging with the subject matter "in a meaningful way" (p. 4), implying that students' performance in examinations may take a higher priority than subject mastery, or enjoyment

of the process of learning. The paper does not mention the use of target grades or comparison of schools within England, however, the repeated reference to the focus on exam performance may also link with the requirement for schools to push students to meet target grades due to comparison between schools via league tables and schools needing to meet school-wide targets relating to students' grades (Leckie & Goldstein, 2017; Chitty, 2009; DfES, 2001). Despite the small sample, it is not unreasonable to infer given the focus on exams that the experiences of these teachers are likely to be shared amongst teachers that did not participate in the study (Marshall & Gibbons, 2018).

On the GCSE Results Day, held in August of each year, schools usually publish specific statistics about the results achieved by the students at their school. Later, usually within a few months, statistics about the school's performance will be published by the Government online as part of the league tables mentioned previously. There were no public examinations in 2020 or 2021 and therefore no data published for these years due to the Covid-19 pandemic, though statistics for school performance for other years can be found online and are publicly available. The publication of these data by schools means that there is likely to be an element of comparison, and therefore potentially competition between schools to land higher on the league tables, and be able to publish 'better' statistics relating to their students' examination performance. The league tables described earlier aim to introduce increased accountability to parents such that they can make an informed choice (despite arguments this is not appropriate (Leckie & Goldstein, 2011)), and are designed to raise standards (for example see Leckie and Goldstein, 2017). Pratt (2016) argued that the use of student attainment data "as a commodity to be made use of" (p. 890) and that the government measurement of school progress primarily using students' test scores supports driving standards up.

2.3.3 Expectancy Effects, Predicted Grades and Estimated Grades

There are two ways in which the expectations teachers have of their students can affect outcomes that are addressed in this chapter. Firstly, in their study comparing various models for measuring school efficacy, Leckie and Prior (2022) found that accounting for students' prior attainment was the most important predictor of their outcomes at GCSE. While this does not provide a specific endpoint for students before they sit GCSE exams, it does demonstrate that, far more than other considerations, academic outcomes are related

to prior attainment. It was shown that by accounting only for prior attainment and no other factors, 54.2% of the variance in student outcomes could be attributed to prior attainment. This certainly goes some way to helping illustrate where target grades may come from, given that there is a statistical expectancy for students' GCSE grades given their year 6 SATs scores. It is worth considering that the remaining variance must necessarily be explained by other factors. The five year gap between SATs and GCSE exams may provide one potential explanation for some of this variance in students' outcomes. The ways in which these predicted or estimated grades may affect students' motivation will be considered further in section 2.5.1. How students may respond to teachers' expectations, and in particular the effect on outcomes, can be found in section 2.5.1.

2.3.4 Summary

Since the introduction of league tables in 1992, schools have experienced progressively increasing need to ensure students make enough academic progress, through the marketisation of schooling with increased parental choice (Gillborn & Youdell, 2000; Holmwood, 2016; Tomlinson, 2001; Leckie & Goldstein, 2011; 2017). With the introduction of targets for schools to ensure a specific proportion of their students meet minimum standards, and the developing measurement of progress over the last two decades, schools are likely to have introduced a range of ways to motivate their students to make additional progress, likely including the use of target grades for individual students. The next two sections of this chapter address the various additional factors that schools may use to induce both intrinsic and extrinsic forms of motivation in their students respectively.

2.4 *Factors Affecting Students' Intrinsic Academic Motivation*

There is a wide range of factors that may support the gradual development of intrinsic academic motivation in students. Students being motivated to work on their academic progress, both inside and outside of the classroom, affects their later success in exams since this motivation aids their effort levels. The concept of *intrinsic motivation* will be considered in this section. The use of target grades may not directly affect the success a student may have in examinations, but since the use of target grades may factor into the overall academic motivation a student experiences, potentially including intrinsic motivation, this is worth considering too.

Students who experience intrinsic motivation are motivated to spend time on academic work and learning for the interest they have in a topic and the enjoyment of learning about it (Gagné & Deci, 2005). Given that intrinsic motivation is not externally driven, it may be challenging for teachers to use motivational tools to induce intrinsic motivation in students. As such, each of the points considered in this subsection that relate to a student's intrinsic motivation are based on the enjoyment of learning a student may experience and what contributes toward that enjoyment, and the values that student may develop that lead to their approach toward their own education. This section considers the effects of school culture, feedback and target setting by teachers for their students, teacher-student relationships, the influence of parents on their child's education, and finally how intrinsic motivation may affect a student's academic outcomes.

2.4.1 School Culture

There are many factors that play into the culture that a school builds over time, and the impacts that culture can have on students' motivation, as well as their academic outcomes. Van Gasse, Vanhoof and Van Petegem (2016) indicate that the deliberate building of culture which in turn leads to a tailored learning 'climate' (MacNeil, Prater & Busch, 2009) can be particularly helpful for students' mental health (which is discussed later, in subsection 2.6.1). They suggested that schools that ranked higher were those with more robust cultures: "testimony from successful school principals suggests that focusing on development of the school's culture as a learning environment is fundamental to improved teacher morale and student achievement" (MacNeil, Prater & Busch, 2009, p.74). A school's culture is defined by

their norms and values, whereas the learning climate refers more precisely to behaviour of both teachers and students, primarily in the classroom; the learning climate is derived from the culture. Further, higher quality peer relationships also are interrelated with a positive school culture. Lynch, Lerner and Leventhal (2013) found that students who engaged with each other in the presence of adults in a structured way were linked to positive academic outcomes. The building of a positive culture to foster peer relationships, better in-class behaviour, as well as effective teacher-student relationships, also support the students' need for relatedness for the sake of building intrinsic motivation. Positive school cultures as described here may support students' enjoyment of school, in part through experienced relatedness, thus potentially supporting their intrinsic academic motivation (Bureau et al., 2022).

A significant factor that one could argue plays into the wider culture of the school is the way students are grouped for learning. For the purpose of this paragraph, 'ability' can be considered acceptably described by a student's prior attainment, despite the potential issues that could be argued with this. There are studies that have highlighted positive outcomes from this practice; for example, Kerckhoff (1986) drew the conclusion that when tested on reading, high-ability students usually benefited from being grouped with other previous high-attainers. His results showed that the students in the high-ability group and the middle-ability group made better progress than the ungrouped students did. However, his study also found that students in the low-ability group made less progress than those who were not grouped by ability: in addition to the point above, this agreed with the "divergence hypothesis" he was testing (Kerckhoff, 1986, p. 850). Kerckhoff (1986) also found that when testing mathematical ability, students' test scores all decreased, and the low-ability group saw their scores decrease the least. In addition, it has been suggested that students could prefer being placed into sets so that they were given similar work to their peers, and this work could be more easily tailored to the needs of the class (Hallam & Ireson, 2006); this is particularly important where examination success may be seen as the primary measure of 'success' in school (Godfrey-Faussett & Baird, 2025). Hallam and Ireson (2006) found that students overall preferred being placed in sets, though their results varied by, and depended on, which set the students were placed in (or if they were indeed placed in sets rather than in a mixed-ability group), the student's gender, and their socioeconomic background. Where students in lower-ability sets

tended to prefer not being placed in ability-based groups, and where students in the lower-ability groups tended to make less progress compared with those in mixed-ability groups or than those in high- or middle-ability groups, one could question whether continuing to set students is an ethical practice. One could argue this is an especially important question given that Ireson, Hallam and Hurley (2005) found that there was no notable benefit for students in ability-based groupings in terms of their academic outcomes. It may be worth noting that while these studies focused on academic outcomes, as opposed to motivation, there is an argument that students making less (or negative) academic progress may be less likely to experience competence (Gagné & Deci, 2005; Ryan & Connell, 1989) in spite of a potential increased feeling of relatedness, perhaps reducing the extent to which students are intrinsically academically motivated.

For the students at the study school that participated in the study, students were grouped by ability (known as 'setting') for a notable proportion of the subjects they studied. At the study school, groups were usually built based on the students' attainment in that subject in the year prior. Grouping students in 'sets' is distinct from 'streaming', since the students are grouped by their ability according to a given subject rather than their ability overall, considering all subjects.

Box 2.2 - How setting students in ability-based groups worked at the study school

2.4.2 Feedback from Teachers and Target Setting

There has been an increasing emphasis on the importance of providing feedback to students such that they can make improvements on their work to support additional academic progress (Siekman et al., 2023; Koenka et al., 2021), though the efficacy of that feedback is dependent on the quality of feedback. The effect of providing feedback on work and helping students to see the value of work they have completed for their future outcomes indicates identified motivation, and the motivation affected is primarily extrinsic. However, Guo and Zhou (2021) concluded that the teachers providing scaffolded support as part of their feedback (i.e. broken down actions that provide additional guidance for students) was helpful for positively influencing motivation. They described placing more emphasis on student input, perhaps with guiding questions or tasks, increased the autonomy that students experienced, thereby increasing the intrinsic motivation students experienced. Improved intrinsic motivation has been shown to support improved academic outcomes (Howard et al., 2021).

However, one could question the extent to which students being provided with specific tasks to complete by teachers could support increased autonomy. It is possible that providing broken down tasks for students to complete as part of their feedback could support increases in perceived *competence* if the students feel confident about those tasks, though this is not synonymous with increased *autonomy*.

In contrast to the literature outlined in the next section describing the potential negative effects on intrinsic motivation of some types of feedback, or induction of extrinsic motivation, Burns, Martin and Evans (2021) theorised the link between a more comprehensive feedback model, labelled 'feedback-feedforward', whereby the provision of corrective information alongside guidance for improvement supported students in setting growth-oriented goals for themselves. The potential for growing intrinsic motivation in students (Burns, Martin & Evans, 2021; Guo & Zhou, 2021) would in turn support the improvement of academic outcomes too. These findings are encouraging and if students are asked to consider how tasks set as part of the feedback-feedforward model may support their future goals (De Bilde, Vansteenkiste & Lens, 2011), and are given a choice regarding whether to complete the tasks, students may experience increased autonomy. However, there is also the chance that the perception of excessive specificity in tasks that students are set as part of their feedback could lead to a *decrease* in autonomy, potentially damaging their intrinsic motivation levels instead.

2.4.3 Teacher-Student Relationships

Building effective and trusting teacher-student relationships can be challenging for both students and teachers, based on several affective factors such as school culture, teacher stress levels, classroom behaviour, and more. This may be especially true when students at secondary schools are likely to be taught by at least 10 different teachers each week (Roorda & Koomen, 2021). A school that expects its teachers to use positive and encouraging language supported more positive mindsets in students (Smith et al., 2018), whereby students benefited more from praise of effort rather than intelligence (Mueller & Dweck, 1998; Smith et al., 2018). Whilst the extent to which the use of this positive language was consistent in Smith et al.'s (2018) study, one could infer that the more consistent this is across teachers and subjects, the more strongly the benefits may be felt by students. It is true that increased use of encouraging language with students may support their feelings of perceived

competence, thereby supporting increased intrinsic motivation, however there is still debate around the efficacy of growth mindsets (for example see Burgoyne, Hambrick & Macnamara, 2020; Dweck, 2006).

Quin's (2017) systematic review investigating teacher-student relationships showed that higher quality relationships led to a range of benefits for students. These included improved school attendance, greater psychological engagement, improved academic outcomes and lower rates of adverse behaviour. Further, there is an association between teacher-student relationships and student engagement (Xiang et al., 2017), whereby the more productive the relationship between a teacher and their students, the higher the engagement of those students in lessons, though there are likely exceptions to this pattern. Xiang et al.'s (2017) study demonstrated the association between these relationships and engagement by considering the students' need for relatedness with their teachers (and with their peers). The use of SDT's relatedness concept (Gagné & Deci, 2005; Ryan & Connell, 1989) also highlights the intersection between teacher-student relationships, engagement in lessons and the extent to which students are intrinsically motivated. In addition, the number of positive relationships a student has with their teachers was found to be predictive of their engagement in lessons (Martin & Collie, 2019), potentially leading to increased academic outcomes. As the number of positive relationships increased, so did engagement. Xiang et al. (2017) found that students' need for both emotional and behavioural relatedness predicted students' engagement in their physical education (PE) lessons. This is to say that the more fulfilled a student's relationship is with their teacher, the more intrinsically motivated the student is likely to be, having one of the key tenets of SDT fulfilled, and engagement will increase as a result. Xiang et al. (2017) focused primarily on PE lessons; however, one could argue that PE being taught primarily in a non-classroom setting may affect the applicability of these findings to other subjects that *are* taught primarily in classrooms and with different pedagogical methods. The association between teacher-student relationships, intrinsic motivation and engagement in lessons is arguably likely to hold true across subjects, even if the association is weaker in classroom-based subjects. These findings also agreed with Quin (2017) whereby improved teacher-student relationships were associated with increased engagement without considering only PE. Stronger teacher-student relationships were also more likely to induce intrinsic motivation in students when those teachers gave encouraging

messages to students ahead of examinations (Alqassab & León, 2024). Their Spain-based study showed that positive messages from teachers was associated with increased intrinsic motivation in students, presumably due to the students' increased perceived competence, consequently leading to increased engagement and then further, increased academic performance. This supports the conclusions from Guo and Zhou (2021) that providing feedback additionally support students' intrinsic motivation. Given the similarity of these findings (Alqassab & León, 2024; Quin, 2017) with others investigating teacher-student relationships and intrinsic motivation, we can be confident in these findings.

On the other hand, in scenarios like those described by Roorda and Koomen (2021), whereby students and teachers have a less positive relationship which was shown to be a predictor of externalising (negative) behaviours, this could in turn damage the chance of an improved relationship. The potentially cyclical nature of poor relationships leading to externalising behaviours from students (which would lead to poorer relationships, and so on), means it could be difficult for some teachers or schools to reach the positive findings for intrinsic motivation that were described by Alqassab and León (2024) or Quin (2017).

2.4.4 Parental Influence

There may also be influences on how intrinsically motivated a student is based on the influence of their parents (or guardians or other responsible adults). A parent or guardian's influence on a child's education could be related to the child's motivation to study as well as simply the potential for exam success. This is in part related to a parent's or guardian's education level (Froiland & Worrell, 2016) whereby the more educated the parent is, the higher the achievement of the student is. Spera (2005) and Patall, Cooper and Robinson (2008) both describing increased parental involvement in homework as having a positive impact on their child's achievement could be related to the parent's education or perhaps the parent's values regarding education (Baker & Barg, 2019), having controlled for various demographical factors. Increased involvement from parents would suggest that such parent values education more highly than were the parents entirely uninvolved, regardless of the parent's own education level. It would be reasonable to suggest that a parent that more highly values education is likely to pass those values on to their child(ren), potentially leading to a greater enjoyment of education and therefore increased intrinsic motivation (if not only increased *identified* motivation, an extrinsic form of motivation). Parents who provided

‘autonomous need support’ to their children, by providing choices related to their studying or otherwise aimed to foster autonomous thinking in the child, supported autonomous motivation (Bureau et al., 2022), though this conflicted with Spera’s (2005) findings that more authoritative parenting styles usually led to higher academic outcomes for the child. A study by Rubach and Bonanati (2023) further supports the association between parental support at home and students’ intrinsic motivation in their work, as well as reducing students’ anxiety in mathematics. However, it may be that some parents that are relatively uninvolved in their child’s education due to socioeconomic factors, for example parents having to work long hours and so not having the time or mental capacity to dedicate to involvement in their child’s education. Overall, the consideration of parents passing on positive values relating to education (Baker & Barg, 2019; Rubach & Bonanati, 2023) and involvement in academic work at home (Spera, 2005; Patall, Cooper & Robinson, 2008) all combined indicate that increased parental influence leads to higher rates of intrinsic motivation in students.

2.4.5 Intrinsic Motivation and Academic Outcomes

As described by Howard et al. (2021), “intrinsic motivation depends on emotive states such as curiosity and enjoyment” (p. 1318; Reeve, 1993). The ideas considered in this subsection can all be attributed to enjoyment or natural curiosity in some way or another. Howard et al.’s (2021) meta-analysis on SDT highlighted consequences for students experiencing different types of motivation. For example, they highlighted that the more intrinsic the motivation a student experienced, the more positively adaptive the outcomes for students and the more positive students’ academic performance was (Howard et al., 2021). Additionally, they identified positive correlations between autonomous (or self-determined) motivation and students’ effort levels, engagement (in learning), and physical activity in exercise as well as a negative correlation with negative well-being outcomes and mental health disorders, for example such as anxiety and depression. These tangential benefits of being intrinsically motivated are important to be aware of and may support increased intrinsic motivation. However, this is not to say that a student is likely to *become* intrinsically academically motivated due to those benefits if they are not in that position already. Given that these benefits relate to a student’s motivation depending primarily on the extent to which their motivation is *self-determined*, rather than whether their source is internal or external, tools for building extrinsic motivation will be considered in the following subsection.

2.4.6 Conclusion

In this section, a range of factors that affected students' intrinsic academic motivation was reviewed, with some regard for how those factors affected their academic outcomes. Several factors related to the ways in which teachers and students interact, for example considering the language teachers used when addressing students and the relationships they build with each other. Additionally, the influence of parents on their child's education was reviewed, along with the impact of feedback students received from their teachers. The various points considered support that by creating enjoyment and inherent interest in academic studies, the increased intrinsic motivation in students leads to improved academic outcomes for those students. Factors that affect students' extrinsic motivation is reviewed in the next section.

2.5 Factors Affecting Students' Extrinsic Academic Motivation

In addition to the intrinsic motivational methods described in the previous section, it is important to note that schools also employ a range of strategies to introduce extrinsic motivation in their students too. When considering the various motivation types described by SDT, it can be noted that identified motivation is an example of self-determined or autonomous form of motivation, despite also being an extrinsic form of motivation. This and the other forms of extrinsic motivation and the extent to which they can be induced using tools is considered in more detail in this subsection.

Extrinsic motivation can be considered as any form of motivation that comes from an external source, and covers both external and introjected forms of (controlled) motivation, as well as identified motivation. "Extrinsic motivation describes the psychological state evident when individuals are driven to achieve outcomes separate from the satisfactions inherent in the behaviour itself" (Ryan & Connell, 1989, p. 1301), i.e. the motivation comes from something other than enjoyment or satisfaction from having completed a task. Given that amotivation represents the experience of *no* motivation whatsoever, this could not be considered an extrinsic form of motivation and therefore is not discussed here. The tools available to teachers and other relevant adults to induce forms of extrinsic motivation are vast and may be associated with varying degrees of exam success. At this point, it may be worth noting that students' knowledge that their performance in the high stakes examinations they sit at the end of their GCSE courses will have an impact on their (educational) future acts as a form of external motivation in itself (Howard et al., 2021), perhaps undermining more autonomous motivations students hold.

2.5.1 Feedback from Teachers, Teacher-Student Relationships and Teachers' Expectations

In addition to the potential for intrinsic motivation resulting from teachers providing feedback to their students, there are also ways in which feedback could introduce extrinsic forms of motivation. This could include individual grades based on an assessment (of low- or high-stakes), verbal or written feedback, or targets the students are set to work on with a view to improve future performance on similar tasks. Again, the targets set for these students are independent of *target grades*, in that these kinds of targets refer to specific and measurable actions a student can take, as opposed to simply a grade to aim for. Koenka et al.

(2021) found that both grades and written feedback were helpful for affecting students' motivation, though grades were additionally helpful for impacting students' achievement. They concluded that "graded students outperformed those who received no feedback. However, they also experienced less motivation to engage in academic tasks for internal reasons and greater motivation to do so as a means to an end" (Koenka et al., 2021, p. 935), i.e. students receiving only a grade are more likely to experience extrinsic forms of motivation. The specific type of motivation students experience as a result of this kind of feedback may be dependent on their reaction to it and the language used in the feedback (for example, see Smith et al., 2018; Guo & Zhou, 2021). It was noted that the use of grades on their own may not support motivation for students, but that the inclusion of written comments supported more intrinsic motivation. Students may benefit from written feedback if they are able to see why acting on the feedback is beneficial for their grades, both in low-stakes assessments and final examinations, and for their (educational) future, leading to at least identified (extrinsic) motivation. Students who do not as readily see how the tasks their teachers set based on feedback are likely therefore to experience controlled forms of motivation (Koenka et al., 2021), especially if their primary motivation for completing those tasks is to avoid sanctions for incompleteness.

Investigating the impact of feedback on student motivation in the context of homework, which will be considered further later in this section, Wu et al. (2024) found that feedback from teachers including "checking homework, discussing errors and providing positive reinforcement" increased motivation (Wu et al., 2024, p. 280). Further, they linked the higher motivation students reported to the creation of a more positive learning environment by teachers such that students more positively valued the use of homework for improving their academic outcomes. One can infer that the 'increased motivation' referred to by Wu et al. (2024) here is most likely to be identified motivation, since students were more motivated by the recognition of the value of the work they were asked to complete, though there is no indication that this increased *enjoyment*, and therefore intrinsic motivation, though the choice to engage in the tasks indicates an element of autonomy. However, it is possible that some students were experiencing controlled forms of extrinsic motivation, if any motivation at all resulting from this feedback. For example, providing only verification feedback was suggested to produce a negative or null impact on students'

motivation. Verification feedback confirms whether the answer to a question is correct or incorrect, and answer feedback, which ought to be provided to students along with verification feedback, provides the correct answers to questions (Marsh et al., 2012). Students that received only verification feedback were found to become more focused on peer competition. Finally, providing directive feedback (identifying errors students have made and “highlight[ing] the corrective action to be taken to achieve the appropriate response” (Sarie, 2013, p. 74) encouraged students’ dependence on teachers, negatively affecting students’ motivation. These findings could arguably be seen to contradict the conclusions described in the previous section (Guo & Zhou, 2021; Howard et al., 2021; Burns, Martin & Evans, 2021), with some methods of providing feedback, or some types of feedback, negatively affecting students’ intrinsic motivation or perhaps inducing extrinsic motivation in those students. The potential impacts of high levels of extrinsic motivation are discussed in chapter 6.

Despite the potential for teachers providing feedback to their students to induce intrinsic motivation, Siekmann et al.’s (2023) study relating to the provision of training to teachers to use more structured feedback for their students’ concluded that students’ motivation to write had not been improved because of the feedback. They wrote, “students need to be motivated and able to regulate their emotions to act upon the feedback, make sound judgments, and use it for improvement” (Siekmann et al., 2023, p. 2). This quote suggests that in order for students to benefit from feedback from their teachers, they need to be somewhat academically motivated before the feedback is provided. This contradicts the points in the previous section made earlier that feedback could be used to induce motivation, whether that is intrinsic or extrinsic. This study took place during the Covid-19 pandemic (discussed later, in subsection 2.6.2), and so they did acknowledge that perhaps the ‘improved’ feedback model acted primarily to counteract a loss of learning during the pandemic (Siekmann et al., 2023), explaining the lack of improvement of outcomes. However, this still does not explain the lack of support for building motivation of any kind. It appears that the suggestion that providing feedback itself may not support building extrinsic motivation in students unless the feedback is accompanied by instructions for specific and measurable actions students should take based on the feedback (which in turn is likely to introduce controlled, extrinsic forms of motivation).

The way teachers interact with their students may vary depending on the expectations that teachers have of those students. Teachers making clear that they have higher expectations of their students, and being encouraging as a result (Smith et al., 2018) can be helpful for students' motivation. External expectations of important others, such as the expectation to go on to higher education, has also been linked to improved likelihood of meeting those expectations (Gregory and Huang, 2013); it is reasonable to consider that this phenomenon may be extended to grade expectations too. If the positive language that teachers use leads to optimism on the part of the student (Perry, Davies and Qiu, 2018; discussed further in section 2.5.2), then this may additionally provide an external motivator for students and support improved academic outcomes. Despite being helpful for students' motivation when teachers are encouraging with the expectations they have of students, Permzadian and Shen (2024) suggested that expectations on their own, while helpful, are not enough to notably influence a student's academic motivation without students already holding some value in their work.

It is possible that, to some extent, these expectations lead to the use of fear appeals by teachers. Putwain and Symes (2011a) investigated the extent to which teachers' use of fear appeals motivated students, or increased their anxiety in relation to sitting GCSE examinations. 'Fear appeals' is a reference to teachers reminding students about the potential negative consequences and long-term impacts of not achieving a given grade at GCSE. They found that when students perceived the teachers' use of fear appeals to be threatening, students' anxiety levels and worry did increase, along with an increase in students setting goals for themselves both to avoid missing a given grade, as well as inducing some mastery-approach goals (Putwain & Symes, 2011a; Dweck, 1986). 'Mastery-approach' goals are those held by students that want to (approach) understand the concepts addressed (mastery) during lessons in a given subject (Dweck, 1986), and there is a positive link between mastery-approach goal structures and intrinsic motivation (Cerasoli and Ford, 2014). Later work by Putwain, Remedios and Symes (2015) built on this, finding that where students interpreted the fear appeal from a teacher as a *challenge* to be met, this was predicted by (and later positively influenced) students having more faith in their ability to meet their goals. If students interpreted the goal to be a *threat* however, as mentioned, this was linked to lower self-efficacy or faith in their own ability (Putwain, Remedios & Symes, 2015; Putwain & Symes,

2011a). The correlation between fear appeals and mastery-approach goals for students suggests some element of encouragement by teachers (Smith et al., 2018), however Putwain and Symes (2011a) were cautious about implying *causality* between fear appeals and mastery-approach goals. A separate article from Putwain and Symes (2011b) showed that the correlations between mastery-approach goals (indicating elements of intrinsic motivation) and consequence frequency (i.e. how often teachers referred to consequences for failure) and the extent to which a fear appeal was perceived as threatening, were between .26 and .36, indicating a weak-to-moderate correlation at most. One would therefore likely need to exercise caution when making claims about fear appeal use and intrinsic motivation (as relating to mastery-approach goal structures) (Putwain & Symes, 2011b). Further, both studies suggest that the use of fear appeals is not inherently motivating or de-motivating but instead that the way a student interprets the fear appeal determines the extent to which they are motivated (Putwain, Remedios & Symes, 2015; Putwain & Symes, 2011a). The way that students interpret the fear appeals was suggested to both *be predicted by* and *to predict* their self-efficacy, however this may also be affected by the way that teachers frame the appeal, though this is not addressed directly by either article.

Beyond the statistical expectancy that may exist for students' outcomes described in section 2.3.3, the way that teachers communicate their expectations of students' outcomes may influence those outcomes. In the 1960s, Rosenthal and Jacobson (1968) published a laboratory study they completed to investigate whether telling students that they were academically gifted led to additional academic progress compared to their peers (by way of self-fulfilling prophecy and a positive improvement loop, or the reverse process), and concluded that this was indeed the case. This conclusion aligns with other literature relating to positive feedback from teachers (Koenka et al., 2021; Wu et al., 2024). Further, this may also be supportive of literature relating to the encouraging language teachers may use (Smith et al., 2018; Guo & Zhou, 2021; Perry, Davies and Qiu, 2018); where teachers communicate positive expectations to students, those students are more likely to meet the higher expectations (Gregory and Huang, 2013). There were a number of critical responses to this study, though as pointed out by Good, Sterzinger and Lavigne (2018), these responses focused more on the study design than on the concept that positive expectations of students can have on improving students' outcomes (or vice versa). This would allow one to infer that teachers

ought to endeavour to communicate positive expectations to students about their academic outcomes, whether those expectations are accurate or not as shown by de Boer, Bosker and van der Werf (2010), though this conflicts with Jussim and Harber's (2005) finding that the predicted outcomes were more consistent when the expectations communicated *were* accurate. There have been attempts to replicate the findings from Rosenthal and Jacobson (1968). Good, Sterzinger and Lavigne (2018) argued that the direction of the relationship between expectations and outcomes cannot be consistently discerned, based on various studies they highlighted that concluded that the relationship was primarily in one direction or the other. However, if the relationship can be described as bidirectional whereby positive expectations communicated by teachers leads to improved outcomes, in turn leading to more positive expectations from teachers and so on, this may support the original proposal of the self-fulfilling prophecy by Rosenthal and Jacobson (1968).

Despite the conclusions of Rosenthal and Jacobson's (1968) study and that some may consider those conclusions encouraging, the study was conducted in a laboratory-style setting and the large number of variables that could have affected students' outcomes make it difficult to confirm how successful this method of motivating students may have been (Brophy, 1983), therefore making it more difficult for teachers in the classroom to replicate the positive findings. Further, despite the positive inference, the effect that teachers' expectations of students had on those students' outcomes were found to decrease as students progressed further through their secondary education (de Boer, Bosker & van der Werf, 2010), again with a range of potential reasons about why this may be the case. These issues may not entirely refute the suggestion that teacher expectations lead to self-fulfilling prophecies in students (i.e. positive expectations support positive outcomes and vice versa), but rather that those expectations have only a small (positive or negative) effect on the student's outcomes (Brophy, 1983; de Boer, Timmermans & van der Werf, 2018), or perhaps were at least inconsistent (Jussim & Harber, 2005; de Boer, Timmermans & van der Werf, 2018). In addition to the methodological critiques of Rosenthal and Jacobson's (1968) experiment, one could debate whether it is ethical to communicate inaccurate yet positive expectations of outcomes to students. However, where some studies have found that, even if rare, this can still lead to improved outcomes, some teachers may find this a justifiable practice.

The extent to which teacher feedback and target-setting influenced students' outcomes was discussed in section 2.4.2, identifying that improved academic motivation acts to bridge such practices by teachers, and their students' outcomes. The findings by Smith et al. (2018) showed that use of more encouraging language as part of the feedback led to improved students' mindsets, likely improving their academic motivation. Along with Guo and Zhou (2021), this provides additional explanation or context as to *how* teachers can make use of the feedback they provide their students, building on what Siekmann et al. (2023) found. Whilst not explicitly suggested, use of more positive language by teachers would logically also help to improve students' relationships with their teachers, which in turn could also provide an additional extrinsic motivator for students' academic work (for example through not wanting to disappoint teachers they like). Communicating positive expectations to students, even if those expectations were inaccurate or dishonest, may have supported students' outcomes (Rosenthal & Jacobson, 1968), though the difficulty in replicating these findings, may encourage teachers to use this practice with caution.

2.5.2 Academic Entitlement

It is important for schools to ensure that the culture they build over time (with respect to the school's norms and values, likely including methods of feedback and the relationships teachers and students build, discussed in the previous section of this chapter) do not induce academic entitlement in their students. Academic entitlement refers to students' attitudes and behaviours in relation to their academic performance and experiences in the classroom, such as expecting that they should be awarded a specific grade for modest effort (Greenberger et al., 2008; Fromuth et al., 2019). Students may rightly be entitled to some specific behaviours from their teachers such as treating others with respect or meeting expectations relating to their teaching role such as explaining concepts, checking students' learning or preparing students for assessments, however this cannot be considered as 'academic entitlement' in this context. Fromuth et al. (2019) concluded that students perceiving an 'external locus of control' (i.e. whether one's success is determined by factors outside one's control) were also likely to demonstrate "uncivil behaviours" (Jiang, Tripp & Hong, 2017, p. 579) such as hostility, anger or disrespect when their (academically entitled) requests were not met (Knepp & Knepp, 2022). In turn, this was related to increased extrinsic forms of motivation, or lower motivation in general (Greenberger et al., 2008), and increase

teacher stress (Jiang, Tripp & Hong, 2017). This could lead to lower academic outcomes (Fromuth et al., 2019) since teachers who are becoming progressively more disengaged or stressed may not be able to build as effective a teacher-student relationship, nor would they be as willing to, or perhaps spend time working on improving teaching methods or providing high-quality instruction (Knepp & Knepp, 2022). This supports the potential non-applicability of the findings by Alqassab and León (2024) or Quin (2017), described in the previous section. Further, it is possible that where teachers inaccurately indicate positive expected academic outcomes, for example through grade predictions (Brophy, 1983; Jussim & Harber, 2005; de Boer, Timmermans & van der Werf, 2018), this has the potential to reduce students' motivation or introduce some element of academic entitlement. Despite this, the academic entitlement of students who did manage to improve their outcomes through each study was not considered, and it is therefore unclear whether students demonstrating academic entitlement were able to cognitively separate progress due to entitlement behaviours, or progress due to the decisions made by teachers to support students' academic progress.

Despite the conclusions of the literature described here, Perry, Davies and Qiu (2018) found that the students who had the highest expectations of their outcomes were likely to correlate most closely with students who had the highest outcomes at the end of their GCSE courses. They described students' optimism, defining optimism as the difference between their expected grades, and the grades predicted by the students' background and previous performance, as a positive impact on students' academic progress, as calculated by their 'value-added' score (Perry, Davies & Qiu, 2018). Their definition of optimism depending on students' own expectations of their outcomes may link to students' academic entitlement, indicating that an element of academic entitlement may support improved academic outcomes despite their extrinsic academic motivation being modest, contrasting the findings by Fromuth et al. (2019).

2.5.3 Parental Influence and Homework

Students who experience extrinsic forms of academic motivation in a given curricular subject, and in general, may do so due to their experience with the expectations their teachers have of them regarding homework completion, or due to the influence of their parents or guardians. If these factors affect a student's academic motivation, then it is important this is considered. Given that homework is often completed in the home, there is

an association between a parent's influence on a student's academic motivation relating to homework completion.

Wu et al. (2024) found that when teachers more consistently checked students' homework and discussed errors that the students had made, providing positive reinforcement as part of the provision of feedback following this, students experienced increased motivation. This likely supports the development of extrinsic forms of motivation ranging from external through to identified motivation, though the specific type of motivation experienced by a student would depend on the characteristics of the individual student. One could infer that the increased positivity in these scenarios would cause the induced motivation to lean toward identified or introjected motivation. Wu et al. (2024)'s conclusion that increased motivation may result from the positive reinforcement that followed homework checking is logically sound, however, the higher expectations teachers had that likely correlated with the increased homework checking was acknowledged to also associate to lower effort from students, since this practice could be associated more heavily with external motivation. This may be the case since varied results from a homework check, for example finding homework to be incomplete, complete to a low standard, or complete to a higher standard, may lead to sanctions or rewards and as such this can be seen explicitly as an external form of motivation. In contrast to the potential for external motivation due to homework setting, these trends may not represent students who understand and accept the potential academic benefits for homework completion, inducing increased identified motivation, rather than external.

When considering students' work at home, some older studies (for example see Epstein & Lee, 1995; Spera, 2005) indicated that less than half of parents of adolescent children checked homework often. This could be accounted for by a perceived increase in maturity of the child, but it was unclear why this was the case. This contrasted with Trautwein's (2007) finding that parents described homework as a "valuable educational tool" (p. 373), and homework frequency being identified as a predictor of academic outcomes (Gershenson & Holt, 2015; Nuñez et al., 2015). Setting homework for students with the knowledge that sanctions wait for them for incompleteness, there may be negative long-term effects for those students, even if the improved academic outcomes are perceived as 'worth it' for teachers (Gillborn & Youdell, 2000), given the additional external motivation for

students. In contrast, despite the potential benefits of homework for student outcomes, there is also evidence that time, Trautwein (2007) found that time spent on homework does not correlate with improved outcomes for students, making it clear that the quality of homework set (Nuñez et al., 2015) is of particular importance.

Earlier in the chapter, the impact of parental values regarding education were considered, and it was explained that parents who more highly valued a good education for their child were likely to support more intrinsic academic motivation in their children. At the same time, there may be some students whose parents do not value education as highly (Froiland & Worrell, 2016), and in these cases students may experience decreased levels of intrinsic motivation (Baker & Barg, 2019; Rubach & Bonanati, 2023). This, along with the expectations students experience from teachers or parents to achieve a specific grade (Godfrey-Faussett & Baird, 2025), increases the likelihood that students' primary motivation (if they have any) would be controlled forms of motivation, i.e. introjected or external motivation. Finally, this supports Spera's (2005) findings mentioned earlier that more authoritative forms of parenting are correlated with improved results, necessitating a reduction in autonomy, and therefore autonomous motivation, in students.

2.5.4 Conclusion

In addition to reviewing the effects of increased intrinsic motivation in the previous section, this section addressed the factors that affect students' extrinsic forms of motivation, as well as the potential impact of extrinsic forms of motivation on students' academic outcomes. These again included the ways in which teachers and students interact with each other and the relationships they may (or may not) build, students' academic entitlement, and the effects of homework setting and checking and the threat of sanctions for non-completion of homework. Increased extrinsic motivation may support improved academic outcomes, however there may be questions about whether this is beneficial for students in the long-term, which will be addressed in chapter 6 Discussion.

2.6 *Student Mental Health and Covid-19*

Regardless of the type of academic motivation a student experiences, their mental health may play a role in their academic outcomes, especially given the increase in reporting on, and the need for, mental health support (Garside et al., 2021). Additionally, the students who participated in this study experienced a significant period of disruption to their secondary education due to the Covid-19 pandemic. The impacts of both of these on the students' motivation and their academic outcomes are considered in this section.

2.6.1 Mental Health and Student Well-being

Whilst physical education has been a feature of English state-funded education for longer, the focus by schools on *mental* health and overall well-being for students has been growing over the last two decades in England. Garside et al. (2021) suggested that there has been a steady increase in the need for mental health support for secondary school students since around 2004, according to a National Health Service (NHS) survey at the time. Later data suggested an increase of around 44% of students experiencing diagnosed mental health issues (from 10% in 2004 to 14.4% in 2017). Garside et al. (2017) concluded that the continually reported rise in mental health conditions for young people can be attributed to, in part, exam pressure and more general school stress. Use of examinations as a measure of the academic progress students have made is not a new phenomenon, though the increase in student stress due to external pressures, for example from teachers or parents, likely relates to the increase in pressure on schools from the UK government (Dearden & Vignoles, 2011; Leckie & Goldstein, 2011; Leckie & Goldstein, 2017). It is possible that students' academic motivation and desire to be successful, regardless of what success means to them, may be in direct conflict of mental health issues or lack of well-being that would allow those students to obtain the success they look for. Other factors affecting student mental health included peer relationships, poverty or socioeconomic position, and social media.

Social media use growth has become "an integral aspect of daily life for young people" (Anthony et al., 2019, p. 5). This includes communicating with friends from 'real life' as well as building relationships with friends exclusively online. It is not clear from Anthony et al.'s (2019) study whether they included engagement with 'social media influencers' in their

paper, though social media use will often include this too. They concluded that social media use could be positively associated with better mental health in students when they were engaging primarily with people that they already had relationships with, but that those interacting with 'virtual friends' reported worse mental health. Were a student to struggle with their mental health while also struggling to cope with examination pressure, the findings by Garside et al. (2021) indicate the potential for a continuing cycle of worsening mental health. Additionally, social media use has been shown to positively associate with poor concentration and worsened academic outcomes (Nurudeen et al., 2023) on average. Where social media acts as a distraction from academic work, for example rather than focusing on completing homework, students may experience less motivation (of any kind) compared to their interest in what their social media feed could show them.

The potential impact of building a positive school culture was discussed earlier in this chapter. Van Gasse, Vanhoof and Van Petegem (2016) highlighted the interdependence between school culture and students' mental health support and well-being. There is therefore a reasonable chance that a school that invests time into building an effective overall culture is also more likely to include support for students' mental health more readily, and so are more likely to see improved academic outcomes (MacNeil, Prater & Busch, 2009), since students would be more able to act on their academic motivation. Further, such a culture may support the positive well-being of both teachers and students, which have additionally been shown to be associated with each other (Bilz et al., 2022; Harding et al., 2019).

Finally, there has been a number of studies relating to the change in students' mental health and well-being as a result of the Covid-19 pandemic in 2020-21, and to a lesser extent, beyond. It is well-known that constrictions were placed on schools and their ability to function normally, as with wider society, during the pandemic, and this largely meant students learning remotely via computers. The specific logistics varied by school, though for the case study school, students attended lessons online via Microsoft Teams and were set tasks by their teachers to complete independently, with other supporting resources where appropriate. There will be need for further studies to consider the longer-term effects of the pandemic on students' mental health in the future, however Reuter, Forster and Kruger (2021) found while the pandemic had overall negative effects in the short term on students' mental health, these effects were less stark than one might have expected, i.e. any achievement effects of the

pandemic on student outcomes may not be related to mental health issues in students. Moreover, Schwartz et al. (2021) reported increased stress resulting from returning to school, concerns about their and their families' health, and ability (or lack thereof) to socialise with peers. The effects of the Covid-19 pandemic on mental health as well as exam performance are considered in the next subsection.

2.6.2 The Covid-19 Pandemic

The Covid-19 pandemic, primarily affecting the academic year 2019-20 but additionally 2020-21, had wide-ranging impacts on students' ability to learn in the same way they were used to whilst attending school as normal. Schools' specific strategies varied for managing students' learning during this time, handling multiple stay-at-home orders through the two academic years impacted. The case study school had students attending online lessons, and completing independent work that was assigned by their teachers, along with links to videos posted online and other resources to support students where appropriate and necessary. This subsection continues to address the impact on students' mental health, begun in the previous subsection as it relates to Covid-19, as well as on the potential effects on students' exam performance both during the affected academic years as well as beyond (i.e. by focusing on the specific students that took part in this study). Whilst the literature cited in this subsection was primarily published shortly after the pandemic had started, it may be worth considering that even at the time of writing (2024-2025) it may still be too early to describe the long-term effects of the pandemic on students' academic outcomes.

Students were likely to struggle to make as much academic progress as they would during in-person schooling. One of the potential struggles students may have faced related to their concentration (Reuter, Forster & Kruger, 2021). It was found that general health was likely affected by changes in lifestyle such as a difference in quality of sleep, or in changes in physical activity. Some students reported improvements in sleep quality, while others reported reductions in sleep quality. Students in Reuter, Forster and Kruger's (2021) study also reported both increased and decreased physical activity. Despite the potential for improvements to health, their participating students reported "a significant increase in difficulty concentrating, remembering, or making decisions" (Reuter, Forster & Kruger, 2021, p. 16/21). These conclusions, even though they were drawn from university-age students, are

likely applicable to school-age students as well given that they were experiencing the same pandemic-related restrictions as those at university. What was not discussed was the, albeit likely small, number of students who may have enjoyed their pandemic-era education more than being in the classroom, and therefore could have made additional academic progress, were they to not be one of the students struggling to concentrate.

Students also demonstrated increased gaps in mathematics and literacy progress due to the pandemic (Schwartz et al., 2021), as well as reductions in opportunities to socialise and work with peers to support each other's work (Van Lancker & Parolin, 2020). Some students likely had access to technology to allow continued communication with peers; however, this communication may not have been as consistent, and may not have been as conducive to collaborative working as being in the classroom. The time not spent in school and therefore not working with teachers on tasks likely led to *some* lost learning for a significant portion of students. According to Kuhfield et al. (2020), the primary factors that led to variability in students' achievement were "differential access to parent and teacher supports for learning during the school closure months" (p. 560), and the socioeconomic status of the students. Socioeconomic status would likely have created gaps in the technology available to students, making access to online resources more challenging for some students, and parents who were not as able to provide educational support due to their own work (Kuhfield et al., 2020; Harvey & Mukhopadhyay, 2007).

In contrast to the points made above, most students were still likely to experience some sort of motivation to maintain their academic work. Combette et al. (2021) found that students experiencing identified motivation were more likely to maintain their higher engagement levels during pandemic-era (remote) schooling, since they were aware of the purposes of continuing to work on their education and how those purposes aligned with their own goals. The identification of alignment between completing academic work and their own goals may have continued to be supported by their teachers, even if that messaging came through online lessons, or from parents. Conversely, students who experienced more controlled forms of motivation were not likely to maintain their academic progress (Kuhfield et al., 2020) during their pandemic-era schooling given that most students now did not have a teacher observing their work in a classroom, or perhaps were at home with parents who were unable (or unwilling) to monitor their schoolwork. This supports the findings described

earlier by Reuter, Forster and Kruger (2021), whereby students may have struggled to maintain concentration and therefore be less inclined to work on their continued academic progress.

Additionally, students in Germany who were set mathematical problems to complete using online software were found to improve their results during the periods of school closures, despite teachers setting more challenging problems (Spitzer & Musslick, 2021). This suggests that perhaps allowing students to work more independently may have supported their academic outcomes. This study did, however, acknowledge that their conclusions (Spitzer & Musslick, 2021) stood in contrast to other studies with similar hypotheses, such as the study by Goudeau et al. (2021), which claimed that education relying on families and technology more than educators hindered students' abilities to be successful.

Taken together, the conclusions relating to lower academic outcomes as a result of the pandemic could logically apply to the majority of students, given that there was likely less input from teachers and less oversight from responsible adults. However, in addition to the studies mentioned above that draw alternative conclusions (relating to *improved* outcomes) these conclusions also did not account for students who were intrinsically motivated to complete their academic work more consistently, who may have maintained their progress or perhaps increased the time they spent learning, at least in the subjects they particularly enjoyed. This is to say that intrinsically motivated students may have struggled less with pandemic-era schooling, at least in terms of the academic aspects, and omitting consideration of the social and emotional consequences of not being at school with peers regularly. In contrast, students who experienced mental health issues during the pandemic may have struggled to maintain their academics, regardless of whether they were intrinsically motivated.

2.7 *Relation of the Study to the Wider Literature and Research Questions*

All the factors reviewed in the last three sections of this chapter may play significant roles in students' academic motivation and their success in examinations at the end of their GCSE courses. There is, at the same time, a noted absence when considering the effect that target grades that many schools issue their students may have, whether that is positive or negative, on student motivation (or examination success). Given that there has been an increase of emphasis on use of academic research to influence classroom practice, as is the case in the study school (Department for Education, 2016), it seems strange that the widespread practice of issuing students with target grades to aim for as a motivational tool has little-to-no theoretical basis. Where it may be helpful to consider students' prior attainment to predict their outcomes at GCSE given the statistical expectancy, it is unclear whether providing these statistical predictions to students as targets is helpful for their academic motivation. Additionally, it seems as though the way teachers frame their use of fear appeals, as well as students' self-efficacy (i.e. their belief that they can achieve their goals) affects whether those fear appeals are perceived as threats or challenges (Putwain, Remedios & Symes, 2015). As a result, the use of fear appeals may hinder or help students' perceptions of their own competence (Bureau et al., 2022). Further, the seemingly important effects teachers can have on their students at the classroom-level compounds the questionable use of school-level metrics for assessing students' progress.

The UK government indicated in their 2016 White Paper (Department for Education, 2016) that it was difficult for teachers and schools to access research to use to support the improvement of teaching practice. As a result, they introduced a new Chartered College of Teaching (with an associated academic journal), and continued their association with the Education Endowment Foundation (EEF) with a view to expand its role in informing teaching practice across England. By the end of the study, the study school had increased reference to the EEF during staff training, and later introduced regular use of the Chartered College.

Box 2.3 - Increased academic research use for teaching practice at the study school and beyond

The use of target grades was not discussed, in reference to student success in examinations nor as an extrinsic motivator, due to the lack of literature on the topic. A school

that makes use of target grades with the goal to use it as a motivational tool will likely account for this in their assessment and feedback policies. The way that the teachers describe and make use of the target grades may influence teacher-student relationships. For example, if a student is graded below their target in an assessment, the teacher can respond with encouraging language, or they could set sanctions and exhibit disappointment. Target grade use by teachers and by the school will depend on (at least in part) the school culture, and will relate to the way parents/guardians perceive their child's academic performance when they receive reports from the school, the extent to which students are academically entitled, and perhaps the students' mental health. Target grades, by nature, cannot be an intrinsically motivating tool and as such it would be worth considering the extent to which they do successfully extrinsically motivate pupils, in conjunction with all the other factors that have been discussed in this chapter. Further, while their use is not likely to support increased autonomy for students, their use may support students' perceived competence through comparison of 'current' grades to target grades, and it may induce feelings of relatedness between students when they have similar experiences vis-à-vis target grade use by their teachers.

Based on the wide-ranging literature discussed in this chapter, there are many different factors that affect students' motivation to work on academic progress such that they can be successful in upcoming examinations. The use of target grades as an extrinsically motivating tool is notably missing.

This lack of literature and the interaction of the factors discussed in this chapter with target grade use in the case study school (and beyond), and the applicability of SDT to this study as described in section 2.2, led to the following research questions to be addressed through the research methods discussed in the next chapter:

1. To what extent do students perceive the use of target grades as motivational?
2. What type of motivation do students experience, and does this align with their perceptions of the use of target grades?
3. Do students' motivational types and perceptions of the use of target grades alter over the course of an academic year?

3 Methods

3.1 *Introduction*

This chapter will detail the specific methods that were used in this study, in order to address the research questions outlined at the end of the previous chapter. Initially, the overarching research design is described, giving some context about the school in which the research took place, along with the general demographic of the school population. Following this is further detail about the participants, both students and teaching staff, including access to, and recruitment of, the participants. After then outlining the pilot study, the three main methods of data generation are explained in greater detail, and the approach that was taken for analysis of the data generated. Finally, I will explain the ethical considerations and implications for the methods used.

3.2 *Research Design*

This study made use of qualitative and quantitative research methods to triangulate the findings to draw appropriate conclusions, using a Self-Determination Theory (SDT) framework (Deci & Ryan, 1985). The study used an adapted psychometric testing questionnaire (Self-Regulation Questionnaire – Academic (SRQ-A)) which has been validated by a number of studies (for example see Ryan & Connell (1989), Patrick, Skinner & Connell (1993) or Grolnick & Ryan (1983)) in order to measure the type of academic motivation that students in Years 10 and 11 experienced during the academic year 2022-2023. In addition to the validated 20 items used as part of the questionnaire, five additional items were added using similar language to address the use of target grades specifically. The study also used a series of focus groups (Robson & McCartan, 2016), following the use of the SRQ-A tests, to gain additional clarity on target grades from the perspective of students, as well as considering other factors affecting the academic motivation of those students according to SDT. A selection of teaching staff across a range of seniority levels were also interviewed in a semi-structure format, and whilst these interviews provided additional context to practices used by the school and comments made by students during the focus groups, the bulk of the

data from these interviews were omitted to account for the already-large scope of the study, and was not used to draw conclusions relating to the research questions.

To build trustworthiness for the study, a number of measures were taken. These take the form of two pilot studies (discussed in section 3.4 later), triangulation of qualitative and quantitative data, and the use of various inferential statistics (Robson & McCartan, 2016; Salkind, 2008) calculating the probability (p) of rejecting various null hypotheses relating to the research questions against a significance level ($\alpha = 5\%$), and use of the Cronbach alpha measurement for reliability.

3.2.1 School context and demographic

Schools in England are commonly measured against two metrics: Progress 8 and Attainment 8. The Progress 8 (P8) of a school indicates the mean difference between the mean grade achieved by a pupil at the end of KS4 compared with the mean grade achieved by a pupil achieving the same at the end of KS2 considering English, Mathematics and six other subjects studied, including Science which can account for either two or three grades, depending on the specific science qualification(s) studied. Attainment 8 (A8) indicates simply the sum of the eight numbered grade, from 9 down to 1, that a student achieves in the GCSEs, including English, Mathematics and their six additional best grades.

The school in the study is considered to be a high-performing school (in the top 5% nationally) in the south-east of England, achieving a Progress 8 score of +0.75 in the 2021-22 academic year (compared to an average across the local authority of +0.16, and nationally -0.03). Additionally, in the same academic year, the school had a mean Attainment 8 score of 65.4, compared with the local authority mean of 52.9 and national average 48.8. While these results consider the academic achievement of a year group not involved in the study, these example data are indicative of the performance of the school, and do not deviate a significant amount from performance of the school before the Covid-19 pandemic. The data provided in this paragraph indicate the latest publicly available data.

The school has around 280 pupils in each year group, totalling 1,750 pupils in 2021-22. Of these pupils, 3.09% had an SEN Education, Health and Care Plan (EHCP) compared to 2.15% nationally, 5.20% were entitled to Special Educational Need (SEN) support compared

to 11.92% nationally, and 8.72% were eligible for free school meals at any point in the previous six years as an indicator for socioeconomic disadvantage, compared to 26.92% nationally.

Students attending the school at KS4 all studied English Literature, English Language, Mathematics, Science (either double-award or triple-award), Physical Education, Religious Education, Physical, Social and Emotional Health (PSHE), and either three or four optional subjects from Geography, History, Sports Studies, Computing, Business Studies, Art, Music, Drama, French, Spanish, Italian, Design and Technology (DT) or Food Technology; whilst some schools have students choose one subject from separate 'pools', there are no restrictions on which subjects students need to choose at this school.

Michael (February, 2023), when asked about the academic culture of the school, said that the aim was to achieve a P8 score of +1 each year, and that some fluctuation around that was to be expected. This would suggest that, on average, students at the study school made one grade-worth of additional progress compared to students nationally, when starting from the same KS2 results. Michael did not mention an aim for the A8 score, though this is presumably since this will fluctuate depending on the specific cohort sitting exams in a given year, and the 'value added' (indicated by P8) indicates additional progress rather than raw attainment.

Box 3.1 - Study school's aim for P8 score

3.3 Pilot Studies

In this section, the pilot studies that were conducted prior to the main study are discussed. Initially the purposes of the pilot studies are explained, and there is an explanation of who participated in the pilot studies and the logistics of running the pilots. Finally, the lessons taken forward into the main study are discussed.

3.3.1 Lessons from the Pilot

In the first pilot study, five students were randomly selected to participate, and these students all completed an SRQ-A test and then participated in the focus group. Since these students had been selected before the SRQ-A was conducted, they all fell into either the *introjected* or *identified* motivation types. This led to the idea that to help gain a range of perspectives, the students in the main study should complete the SRQ-A and then be randomly selected from each motivation type to produce a purposive stratified sample of students. Whilst this was not enacted for the second pilot study, it aided the decision making around the structure of the main study.

Steps were taken during the pilot studies to ensure that the items in the SRQ-A were reasonable for use in the main study (Robson & McCartan, 2016). During the first focus group, the SRQ-A (which was completed using Microsoft Forms) was written such that the sentence stem for all 25 items (“I am motivated to study...”) was written at the beginning, and not repeated at the beginning of each new item. Following the completion of the first pilot focus group, students commented that it would have been helpful for the sentence stem to remain at the start of each item, such that it was not forgotten whilst the students were completing the questionnaire. As such, for the second pilot study and the entire main study, the sentence stem remained visible on each item (Robson & McCartan, 2016).

The first focus group was less successful than the second focus group in identifying student body language and being aware of when a particular student wanted to talk. For example, if a student opened their mouth to start speaking or made a gesture with their hand that indicated they would like to speak, during the second focus group it became easier to notice these behaviours and make a mental note to ensure that student had a chance to discuss the concept being talked about at the time. Whilst no data were collected or kept from the pilot focus groups, ensuring that every student had a chance to discuss each concept

that they wanted to. Students were made to feel comfortable speaking by, for example, not rushing students to speak or feel they had to be concise in their responses, and providing reassurance that their perspectives mattered and would be listened to in earnest. This meant they would have been more likely to be more honest, and more comprehensive, in their responses (Cohen, Manion & Morrison, 2018). By ensuring I was comfortable supporting students in their responses in these ways, when it came to the final focus groups, there was a higher level of trust that students would be honest in their responses, improving trustworthiness of the data.

The pilot focus groups also afforded an opportunity to practise ensuring that all of the available information about a comment or opinion from a student was provided. In a few cases in the first pilot focus group, a student made a comment that was left without further elaboration. In the second pilot, students who made comments without sufficient detail were asked to expand on those ideas. Sometimes, students asked each other to elaborate, and in several cases the elaboration led to further discussion between students rather than stopping with short or undetailed answers. This further helped ensure that the collection method remained closer to a focus group than a group interview.

In addition to explicitly asking students to elaborate on ideas and suggesting that they discuss questions with each other, in order to elicit more discussion between the students during the second focus group, rather than solely asking questions to the group, time was built in before each question for the students to discuss a prompt, printed onto a sheet of paper and placed in front of the students. The prompts were not phrased as questions, but rather short statements or phrases that were relevant to portions of the study. Examples of these prompts included 'target grades' or 'I have autonomy in my studying', both relating to key components of the study, with the latter based on SDT. The use of these prompts during the second focus group led to a lot more discussion between the pupils about the concepts on the prompts, before being able to provide responses to the specific questions which were still asked following each prompt.

Finally, to try to more explicitly discern which factors students found most important for their academic motivation, a series of factors were also printed on to one sheet of paper each, and the students were asked to sort the factors in order of most important or significant to least important or significant. These factors included reference to the three strands

according to SDT, target grades, others' perceptions of the student, and others. The students were told that they could place them in any shape they want, from a straight line to a 'diamond 9' shape. Whilst the students did ask questions about the rules to complete this, there was further discussion between students about which factors they each found most and least impactful in their motivation. This task assigned to the students proved to be useful not only in encouraging peer-to-peer conversation, but also for providing more context to what the students had said during the pilot focus group, and so this was also continued into the main study.

In summary, while the pilot studies were primarily helpful for gaining experience in running focus groups and ensuring that all students who wanted to share a perspective on a prompt or question had the opportunity, there were other benefits too. Namely, I was able to clarify the method to be used for selection of students to participate in the focus groups in the main study, as well as introducing the idea of using prompts between questions to encourage discussion between the participating students and introducing the sorting task to discern which of the factors we were to discuss were the most and least important for the students.

3.4 Participants

In this section, the recruitment of participants for the study is outlined and further context for the participants is given. This begins with the student participants, and will be followed by details about the teaching staff participants. This section then details the recruitment of, and access to, the participants.

3.4.1 Participants – Students

Of the students in KS4 during the study, the following categories or applied to the shown proportions of students:

Category	Proportion of students (Y10 N=254)	Proportion of students (Y11 N=232)
Special Educational Needs (SEN)	14%	15%
Free School Meals at any point in the last 6 years (FSM6)	9%	10%
Pupil Premium (PP)	9%	10%

Table 3.1 - Proportion of students in the whole study with each flag

Of the students who participated in the focus groups, the same data are shown:

Category	Proportion of Y10 students (first focus group) (N=5)	Proportion of Y10 students (second focus group) (N=5)	Proportion of Y11 students (N=5)
Special Educational Needs (SEN)	20%	0%	0%
Free School Meals at any point in the last 6 years (FSM6)	0%	0%	0%
Pupil Premium (PP)	0%	0%	0%

Table 3.2 - Proportion of students in the focus groups with each flag

Participant type	Participation method	Participant aliases
Year 11 student	Focus groups 1 and 2	Eric, Heidi, Kyle, Wendy, Stan
Year 10 student	Focus group 1	Brian, Chris, Cleveland, Joe, Lois
Year 10 student	Focus group 2	Bonnie, Glenn, Meg, Peter, Stewie
Staff	Semi-structured interviews	Michael (interviewed February 2023), Jim, Kevin, Pam, Creed (all interviewed March-May 2023)

Table 3.3 - List of Aliases

3.4.2 Participants – Teaching Staff

At the study school, there is a significant range in years of experience of the staff, including some staff having started teaching at the school in the 1980s through to some Early Career Teachers (ECTs; teachers in their first two years of full-time teaching). Of the five teachers who took part in the study, the teachers had a mean 9.6 years of experience, with four of the five teachers having taught exclusively at this school. Of the five teachers, three primarily taught subjects that would usually be considered ‘core’ subjects, i.e. English, Mathematics and Science, and two taught subjects usually not considered ‘core’, including but not limited to humanities subjects, Business Studies, PE, Computing, visual or performance arts, or others. In addition, of the five participating teachers, one was a member of the Senior Leadership Team, one had a role considered Middle Leadership, and three were classroom teachers (including one of them being an Early Career Teacher). The exact subjects taught or exact job title for the teachers have not been given since this may compromise anonymity for these participants.

3.4.3 Access and recruitment of participants

During the study, I was a teacher at the main participating school. All students in Years 10 and 11 (ages 14-16 years old) in the participating school were eligible to participate in the study if their parents/guardians did not withdraw consent for participation. The Participant Information Sheet (PIS) was sent out several weeks before the commencement of the study, but the deadline for withdrawal ran until the data analysis process started (after data

collection). The parents of three students withdrew consent for their children, so they were not included in the study and did not receive further communication about the study or materials relating to the study.

Students participating in the focus group elements were deliberately selected to represent a range of motivation types based on their responses in the SRQ-A. Once the mean-average score for each motivation type had been calculated for each student and therefore which motivation type they most align with had been identified, a random number generator was used to select random students using their unique numerical identifying code to participate in the focus group; the first pupil returned by the generator that aligned with each motivational type (including amotivation) was to participate in the focus group. Upon notification of selection, if a student had not wished to partake in the focus group, then the random number generator would have been used again until another student of that motivational type was selected and agrees to participation. No students withdrew their own consent for participation.

A stratified purposive sample of teachers was used: teachers participating in the interviews were selected randomly from a list of all qualified teaching staff within the participating school. To achieve this, a list was obtained of all the qualified teaching staff in the school and each was assigned a random numerical code, and categorised as either Senior Leadership Team (SLT), a middle leader (ML) or a classroom teacher (CT), based on my knowledge of the responsibility structure within the school. A random number generator was then used to select the staff members. To select staff with a range of experience, the first member listed in each of the SLT and ML categories were selected, and the first three classroom teachers were also selected. The generator was saved at this point to allow selection of further participants should one of the selections not have wished to participate, though this was not required later. There were no payments or incentives provided for participation.

3.4.4 Consent for Participation

Prior to consent being sought, all parents of students were supplied with a Participant Information Sheet (PIS). This was written in plain English so anyone, including these particular

pupils, and their parents/guardians, could understand it; following a discussion with the relevant Heads of Year, no parents or guardians were identified as needing a translated copy of the PIS. The PIS informed the parents/guardians of the aims of the study, what data would be collected, how the data were anonymised and used, and how to withdraw consent from the study should they so have wished. It also included my (and my supervisors') university email addresses, as well as the School of Education Ethics Board email address, so that parents could ask any clarifying questions they may have. The PIS for parents/guardians can be found in.

Consent was sought from the parents of all students in Years 10 and 11 in the participating school. Given that the school routinely issued students with questionnaires and held focus groups for pupils twice in the year, with parents aware of this, collection of consent occurred through an opt-out system whereby parents or guardians were able to withdraw consent for participation of their child at any point until the end of the data collection phase on May 31st, 2023.

An opt-out system was chosen to avoid students being excluded from the study for the sake of parents missing the email or forgetting to add consent. It was particularly important to include students from a range of socioeconomic backgrounds, but those from the most disadvantaged backgrounds were less likely to actively provide consent which could potentially have damaged the representativeness of the data (Robson & McCartan, 2016). This could have led to the exclusion or underrepresentation of that demographic from participation. As a result, the data collected may have been less generalisable than was desirable and would not be truly representative of the wider student cohort; it has been shown that opt-out methods of obtaining consent are more likely to be inclusive of a wider range of students and therefore be more representative of the student population (Henshall et al., 2021). Additionally, an opt-out method was chosen to encourage higher response rates, since opt-in methods of consent tend to lead to lower response rates, yet this method still provided the (prospective) participants with all the information they needed beforehand to make an informed decision, and would have been no more stressful for the participants to take part (Hunt, Shlomo & Addington-Hall, 2013), even if the material turned out to be of a sensitive nature (which was not expected in this study).

Since the SRQ-A was scheduled to be administered during timetabled tutor time (the first timetabled event in the morning, lasting 20 minutes) or a timetabled lesson, students were collectively encouraged to complete the questionnaire to help maximise participation rates. Should students have not wanted to participate, or had their parents withdrawn consent, these students were provided with separate tasks (relating to their usual academic schoolwork) to complete in order to avoid distracting the students who did participate.

Teachers who were invited to participate were issued a separate Participant Information Sheet (Appendix A – Participant Information Sheets) for the semi-structured interviews, detailing the same information as the parents/guardians of the student participants. The Teacher PIS differed in that it explained what data would be collected from the interview, rather than through the SRQ-A and focus groups. If teachers did not wish to consent to participation, then they were welcome to not participate. Consent was allowed to be withdrawn at any stage until data had been anonymised for analysis on the same data as for students. Up until that point, any data recorded for that teacher would have been destroyed (had the request been made, which it was not). Whilst the data collected from the teachers were not eventually used to draw conclusions, the data provided from this method were still used to provide context to statements made by students in the focus groups, or to help explain the setting in which the study took place.

3.5 *Data Generation Methods*

In this section, I will detail the specific methods that were used to collect data from the student participants. For the students, this meant the use of a psychometric testing questionnaire (the SRQ-A) with follow-up focus groups after the first and last SRQ-A conducted with each year group. Five members of teaching staff also took part in semi-structured interviews, however the data from these were omitted for the purpose of deriving conclusions.

3.5.1 Psychometric testing of students

Given that the overarching focus of this study is the academic motivation of students relating to the use of target grades, and is based in a SDT framework, the psychometric testing questionnaire chosen to be administered to students was the Self-Regulation Questionnaire – Academic (SRQ-A). This test had been validated previously by multiple users, Ryan and Connell (1989) (or see studies such as Patrick, Skinner & Connell (1993) or Grolnick & Ryan (1983)), when it was published using 20 original items. More detail about the purpose, design and validation of new items can be found later in this section. The wording of each item can be found in Appendix B – Data Collection Tools, where the items are identified as original or new. The use of multiple-choice response items was built into this test, but it has been suggested separately that students’ metacognitive and satisfaction ratings from completing multiple-choice responses rather than constructed (longer written) responses (Lindner, Schult & Mayer, 2020).

The questionnaire was completed by students using Microsoft Forms under exam-style conditions, and for each item the students were asked to rank their level of agreement on a scale of 1 to 5, where 1 represented strong disagreement and 5 represented strong agreement. The primary reason for using a five-point scale was that this is the same as the scale used when the SRQ-A was designed (Ryan & Connell, 1989) and it did not seem necessary to change it. The use of a reduced scale (e.g. a three-point scale) may not have provided any nuance or detail to the findings from the SRQ-A. However, the use of a larger scale (e.g. a seven-or-more-point scale) could have added in too much subjectivity. Cohen, Manion and Morrison (2018) wrote “numbers have different meanings for different

respondents” (p. 481) explaining that “one respondent’s scale point 3 might be another’s scale point 4” (p. 483). By making the decision to use the five-point scale, the participating students had sufficient options to indicate their level of agreement with each statement without introducing unnecessary overlap in what each scale point meant to each student. The use of Microsoft Forms meant that the students were required to log-in to access the questionnaire so they could be identified for potential participation in the focus group that followed the first and last questionnaire, and so that their responses for each of the questionnaires could be matched up over time. Students were reassured at the point of completion that their responses would not be shared and were confidential. As discussed previously, the students’ responses were pseudonymised once the data collection had finished. One of the additional benefits of using Microsoft Forms was that the questions could be randomised for each pupil so that two pupils sitting next to each other were unable to copy the other student’s responses; the randomisation of the order the items were presented to students in was not seen to affect the data produced by the students’ responses. This also reduced the students’ ability to identify patterns in the items they were responding to. Further, there was no requirement for a human to copy paper-based responses into a digital format, where there would have been the chance for the incorrect transfer of data, as well as a significant loss of time.

Whilst completing the questionnaire, students were held under a variety of conditions to ensure the integrity of the method of data collection. The use of the students’ mobile phones in their usual tutor classroom where they started each morning that they did not need to attend an assembly, rather than moving to a classroom with desktop computers in meant minimal disruption for pupils immediately before beginning the questionnaire. Additionally, the students were asked to complete the questionnaire in silence, as they would be used to with a range of tasks across different subjects in the school. Silent completion of the questionnaire meant that students were not communicating their decisions on each item such that they were completing the questionnaire on their own, rather than with the influence of their peers. This helped the trustworthiness of each response from each pupil. Whilst the way the classrooms were laid out meant that a student could look at the responses from another student, the choice to randomise the order the items appeared in for each student meant that it was unlikely two students would be responding to the same item at the

same time. Finally, completing the questionnaire during time in their tutor groups meant that there were no lessons beforehand in which students could have had their moods changed (positively or negatively) by those lessons, their peers or their teachers. This was important since having a particularly positive or negative lesson before completing the questionnaire may have skewed the students' responses, were they to keep such experience in mind while responding. The conditions in which students completed the questionnaire were familiar to them since they were regularly asked to work in silence during lessons, sometimes asked to use their own mobile phones (or school iPads if they did not have access to a mobile phone), and completed questionnaire-based surveys (Robson & McCartan, 2016) at least once per year to feed back to the school – the lack of novel experience here meant that students were not likely to have been perturbed by the use of a questionnaire for this research.

At the start of the questionnaire, the member of teaching staff in charge of the group was asked to read a statement that can be found in Appendix B – Data Collection Tools. The statement described the conditions for students to complete the questionnaire in, with explanation where necessary. The tutors also reassured the students that they were allowed to take as much time as they needed to complete the questionnaire.

The first teaching period of the day on Thursdays, immediately after tutor time, every student stayed in their tutor classroom for a PSHE lesson. Every tutor time where a questionnaire was taking place was on a Thursday so that the students could take longer than 20 minutes to complete the questionnaire should they have needed to. Feedback from the tutors after questionnaire completion indicated that no students took longer than 20 minutes to complete the questionnaire.

Box 3.2 - Time allowed for students to complete the SRQ-A

Following the first and third SRQ-A rounds for each of the two year groups, students were selected for participation in a focus group, leading to four focus groups in total. Once the students had completed the SRQ-A, the separate scores for the four motivation types (and amotivation) according to SDT were calculated, and the motivation type that each student most closely identified with was calculated, but further quantitative analysis was left until later. A student's score for each motivation type was calculated as the mean average of their responses to each item with that motivation type (de Bilde, Vansteenkiste & Lens, 2011).

From each motivation type including amotivation, one student was then selected at random to participate in the focus group at that point. At the point of selection, each student was notified of their selection to participate in the focus group and given logistical details such as location, date and time. A notice was also sent to their form tutors so that the students could be reminded to attend, and the students were sent a final reminder email the evening before each focus group. Whilst participation was optional, none of the students opted to remove themselves from participation.

3.5.2 Purpose, design and validation of new SRQ-A items

In addition to the original items in the SRQ-A students completed, five new items were added relating to the use of target grades, with the goal of measuring the extent to which students felt motivated by their target grades. Given the novel nature of attempting to measure students' academic motivation as it relates to target grade use, there was not a previously validated scale or test to use. The five new items, as well as the previously validated original 20 items, can all be found in Appendix B – Data Collection Tools. The new items are also in the table below. All five items, just as with the original 20, were preceded by the sentence stem 'Why are you studying in general? I am motivated to study...' (Ryan & Connell, 1989), and this stem was provided with each individual item, rather than only at the start of the questionnaire. Each new item used the language associated with each motivation type according to SDT, with one new item for each motivation type (and amotivation). The specific wording of each of the new five items was carefully chosen to ensure that the items would be as comprehensible as the original items, given that the original SRQ-A had been previously validated (Ryan & Connell, 1989). For example, the first new item, aligned with external motivation, was worded "...because I'm supposed to meet my target grades". This wording was chosen because the phrase 'supposed to' indicates that there is some external, extrinsic expectation on the student to meet their target grades, without any indication that the student has internalised that expectation, even to a limited extent. The item aligned with introjected motivation, in line with the way this is defined (Gagné & Deci, 2005; Ryan & Connell, 1989), while still negatively coded, indicates the influence of the student's ego. The item aligned with identified motivation indicates a degree of internalisation whereby a student has determined that meeting their target grades is a goal they wanted to meet. Finally, the item aligned with intrinsic motivation does not provide evidence that a student is

intrinsically motivated by their target grade. Rather, it indicates the strongest positive orientation towards target grade use within this set of new items. The final item indicates an element of aspiration, perhaps similarly to students who take the meeting or exceeding of target grades as a challenge (Putwain, Remedios & Symes, 2015) as a result of teachers' use of those target grades. How students' responses to these new items were analysed is addressed in section 3.6.1.

Motivation type group of items aligned with	New item
Amotivation	I'm meant to aim for my target grade but this is pointless
External	...because I'm supposed to meet my target grades
Introjected	...because I don't want to miss my target grades
Identified	...because I want to meet my target grades
Intrinsic	...because I need to exceed my target grades

Table 3.4 - New five items added to SRQ-A

Following the design of the new items, these were shared with my supervisors to establish 'face validity' (Artino et al., 2014), whereby they confirmed that the items, with their experience, did appear to use the same language as the established and previously validated items. This also allowed for confirmation that the items were likely to measure what they were intended to measure. Beck (2020) argued that examining questionnaire items to work toward content validity in this way is not enough on its own to claim that the scale is fully validated. This is, however, still helpful for establishing an additional degree of trustworthiness in the new items.

Next, two pilot studies were conducted (with time between for improvements to technique). While these were helpful for gaining experience running a focus group, these also allowed an opportunity to determine whether the five new items were as easy to understand as possible (Robson & McCartan, 2016). This was determined in part by asking the students about how they interpreted the items during the pilot focus groups, but also by examining students' responses to the items in their completion of the adapted SRQ-A.

Having been satisfied with students' understanding of, and the consistency in their responses to, the new items, these were included in the adapted SRQ-A as planned for the main study for descriptive and inferential statistical analysis, which will be described later in this chapter. At each stage of data collection, Cronbach's alpha (Salkind, 2008; Cohen, Manion & Morrison, 2018) was used to determine the internal consistency of a given student's responses within each motivation type. Of all the Cronbach's alpha calculations, all but one returned $\alpha > .7$ (and the last returned .664). These data can be found in Appendix D: Statistics Summary Tables. With only five items per motivation type used to calculate Cronbach's alpha, each item had an important impact on the final value each time and so the good level of consistency here provides further reassurance that the language in the items was consistent. Ideally, a test such as confirmatory factor analysis or principal component analysis (Artino et al., 2014; Cohen, Manion & McMahon, 2011) would have been helpful, however with only one new item per 'factor' (in this case representing motivation types), this was not feasible.

3.5.3 Focus groups with students

The justification for using heterogenous focus groups as opposed to another qualitative method (Robson & McCartan, 2016) was based on multiple factors. One of the most significant of these justifications considered the increased efficiency of collecting data from students of all five motivation types at the same time during each focus group; to gain the same range of perspectives, 20 separate interviews would need to have taken place. Additionally, the inclusion of students of a range of different perspectives meant that they were able to interact with each other, challenge each other's viewpoints, and build on each other's responses to provide richer data. The use of groups rather than individuals also meant students may have felt more empowered to share their views compared with discussing the topics in the focus group independently with only me present. The size of the group (five students) meant that the group was more manageable during the focus group for a single researcher, but whilst still covering all five motivation types. Cohen, Manion and Morrison (2018) suggest that either four to 12 students, six to eight students, or six to seven students is the optimal number of students for a focus group (depending on which literature they refer to; see p. 531 and p. 533). This meant that the decision to continue with five students was

made since this covered all four motivation types (and amotivation) without over-representing any one or two motivation types by inviting additional students to participate.

During the focus group, there were 10 prompts and 12 questions that were asked of the students, with all of the prompts leading directly into one of the questions. The two questions not preceded by prompts both included a statistic for students to consider and discuss before answering the question. Each prompt was placed in front of the students on a single (otherwise blank) sheet of paper to invoke a discussion between them about the prompt, and the corresponding question was asked shortly afterward. The students were encouraged to discuss the prompt with each other, and this was allowed to continue until there was a natural lull in the discussion, at which point the question would be asked. The discussion provided some time for students to 'think out loud' with the safety of their peers, so that they could elaborate on their opinions, and at a few points during the discussion they were asked to elaborate on what they had said, and explain it where necessary. These requests for elaboration followed comments by students who could have given more detail in response to the prompt or question, or if it related more generally to their academic motivation, or finally if the comment alluded to one of the other components of SDT or the use of target grades. The question that followed each prompt aimed to gain further insight into the perspective of each pupil on the prompt and topic of discussion more explicitly. The sorting task described earlier as part of the second pilot study was also included at the end of all four focus groups run as part of the main study. Whilst the students were asked to complete this task as a group, with time for explanation for how the factors were ordered at the end, individual students were also able to highlight any particular factors they would have placed in a different location and explain why that was the case.

Whilst there could have been a challenge in running the focus groups without appropriate expertise, the running of the two pilot studies helped mitigate for this. Further, there may also have been the possibility for confidentiality issues following the end of the focus group, however the reminder to students at the beginning of the focus group that they should not repeat what others had said would have helped each student feel confident enough that their responses would not be shared and so felt they could be truthful in their responses. Some educational researchers would consider focus groups unrepresentative of the wider sample of students who completed the SRQ-A (Robson & McCartan, 2016), however

the deliberate use of a heterogeneous group accounted for a wide range of views to minimise the potential impact of this lack of representation. Finally, the decision to audio-record each focus group meant that the words used by each student were recorded, reducing the potential reliance on notes taken during the focus group to draw conclusions from, and the topics of discussion were not sufficiently sensitive that students felt nervous about being recorded in this way. Notes were still made during the focus group to help aid the extended questioning of students when they made comments of interest.

Following the focus group, the audio recording was used to create a transcript of the focus group, which was then edited and corrected manually while listening to the raw audio recording. Further information relating to the analysis of the focus group data is described in the next section.

3.5.4 Semi-structured interviews with teaching staff

Early in the academic year in which the study took place, five semi-structured interviews were conducted with members of teaching staff. These interviews had a set list of questions to try to guide the conversation with the participants, however the use of a semi-structured interview (as opposed to a structured interview) meant that there was more scope for elaboration on certain points (Cohen, Manion & Morrison, 2018). The requests for elaboration from the members of teaching staff were used to gain additional context to the responses they gave, or to gain further information about students' academic motivation (from the perspective of the teachers) or the use of target grades by students and by staff within the school more generally.

Following completion of the interviews, it was decided that the teacher interviews were not going to be used to derive formal conclusions relating to the study due to the large volume of data collected from the three research methods, including these interviews. However, these interviews did provide additional context to the data collected from the two data collection methods used with the student participants, and this context will be referred to throughout this thesis. The use of teacher data, even only as context, meant that the participating teachers did not, in the end, waste their time by participating.

3.6 Methods for Data Analysis

In this section, the methods used for data analysis are discussed. This considers both the analysis of the qualitative data from the student focus groups using a thematic analysis (Braun & Clarke, 2006) approach, and the quantitative data from the psychometric testing questionnaires with the use of descriptive and inferential statistical analysis. Following this, the triangulation of the data is discussed further, with reference to reliability and validity of the methods used, and the trustworthiness of the data collected and the findings.

3.6.1 Descriptive statistics from the SRQ-A

The quantitative analysis for both descriptive and inferential statistics depended on the use of the coding language R. This language was chosen over others, such as Python, since R is described as a program primarily for statistical computing on the program's website (The R Project, 2025). Further, I thought I would enjoy learning to use R more.

Since all the quantitative data were collected via Microsoft Forms, the data were exported into a Microsoft Excel sheet, where the names of each student were substituted for unique identifiers (UIs), and additional columns that are inherent to exported spreadsheets from Forms (such as 'feedback' for each participant response, which was not required) were deleted. Each sheet was then saved in the Comma Separated Value (.csv) format such that they could be imported and analysed using R.

For each year group participating in the study, the three exported sheets (one from each SRQ-A round) were combined into a new single sheet, matching the data for each student via their UI. R was then used to find the relevant responses for each of the five motivation types and calculated a mean value for each motivation type for each student. The mean values were then appended into additional columns in the same sheet. Following this, the mean values were used to calculate the Relative Autonomy Index (RAI) (Howard et al., 2020) for each participant at each point in the year, and the standard deviation in the RAI values for all of the students (in a year group). I then used R to produce a box plot of the RAI values for each point in the year so that these could be compared, and a normal distribution curve for the RAI values at each point in the year, again so these could be compared.

Once this had been completed, the same code was used to follow the same process for the other year group. The RAI is a method of measuring the motivation of a given student using a composite of the mean scores for each of the four motivation types, excluding amotivation. The reason for exclusion of amotivation in the RAI value calculation is discussed below. The single value produced by this calculation for each student indicated the extent to which a student felt autonomously motivated (Howard et al., 2020). The formula below shows how the RAI was calculated for each student, whereby the motivation type is found from the mean scores of each motivation type for a student:

$$RAI = (-2 * external) + (-1 * introjected) + (1 * identified) + (2 * intrinsic)$$

(Howard et al., 2020)

where the words detail the mean score for each pupil for the named motivation type, excluding the item related to target grades for that motivation type.

Whilst this measure does not describe in detail the extent to which a student experiences each type of motivation separately, the scale of possible values allowed for identifying specifically how *autonomously* motivated a student was, and therefore the extent to which they experienced self-determination in their academic motivation. Students' amotivation scores have been omitted from the RAI calculation in this study (such as in for example Niemiec et al., 2006; Soenens et al., 2012) given the stronger establishment of the given formula above, and to avoid a strong negative skew on the RAI value as a result of amotivation scores. For example, if a student were to produce an RAI value of exactly 0 using the above formula (Howard et al., 2020), suggesting they experienced autonomous and controlled motivation types in equal parts, they would likely have chosen 1 on the scale for each item associated with amotivation. This would mean that an RAI formula *including* amotivation would return a value of -3 for the same student. This would necessarily move the mean value on the RAI distribution curve (expected to be approximately normally distributed) to approximately -3 , rather than 0. The RAI values the students returned would still distribute in the same pattern regardless of amotivation's inclusion or exclusion, but reducing every student's RAI value by between -3 and -15 could have introduced assumptions in the reader (or myself) that students were less autonomously motivated than

they really were. Amotivation has still been accounted for through the distribution of students associating with each motivation type: the distributions are outlined in section 4.5.

To determine the extent to which students were autonomously motivated by the use of target grades, R was then used to calculate a 'Target Grade Affinity Index' (TGAI). This measure used the same formula as for the RAI, given that it is based on the same principle, but TGAI used exclusively the four responses students gave to items about the use of target grades, each affiliated to one motivation type excluding amotivation, as discussed previously. The language used in each of the new items mirrored the language used in the established and previously validated items (Ryan & Connell, 1989) from the original SRQ-A. This language, as with the existing items, derives from SDT-focused language, meaning that these new items additionally were theoretically informed. Each motivation type, excluding amotivation, is assigned a weighting for calculating RAI, and so the same weighting method was used for TGAI. Given that the language was similar enough, according to the Cronbach's alpha values (described in section 3.5.2), the same weightings were used to calculate a TGAI value. This firstly meant that the new items relating to intrinsic and identified motivation were weighted positively, and the items for introjected and external motivation were weighted negatively. This also meant that, like when calculating RAI (Howard et al., 2020), the intrinsic and external motivation items were double-weighted. As an example, the language for the new item relating to external motivation may not be more *negative* than the language for the new item for introjected motivation, however the language for the external motivation item indicates a reduced level of autonomy compared to the introjected motivation item. As the TGAI score of a student increased, this indicated that the student was more likely to be motivated by their target grade, with an increasing degree of internalisation of the goal their target grade provided.

Penultimately, the TGAI calculations were then compared with the mean target grade for each pupil that participated in the study across all of the subjects they studied in the academic year that the research took place in. This comparison took the form of a Spearman Rank Correlation Coefficient (SRCC) (Cohen, Manion & Morrison, 2018) to ascertain the extent to which the students were autonomously motivated by the use of target grades correlated with their actual target grades. Finally, the TGAI values were also compared with the RAI values for each student, also using a SRCC calculation. The SRCC was chosen since in the two

cases where SRCC was used, the relationship between the variables was not necessarily expected to be a dependent one (although it could have been). In both cases of use of the SRCC, a scatter plot was also generated for each of the two relationships in order to visualise any correlation that may have been present, displaying the SRCC value on the plot. Additionally, given that the data were ordinal rather than on a scale, where it is necessary for the points on the scale to be 'evenly spaced', this seemed like a more appropriate choice compared with the Pearson Rank Correlation Coefficient (Cohen, Manion & Morrison, 2018).

During the analysis stage, it became clear that some students' responses to the SRQ-A led to ties in their motivation type, primarily between two motivation types, but in some cases, between three or more motivation types. After the first, second and third rounds of data collection, 85%, 77% and 79% of students that participated were associated with a single motivation type, with the remainder being associated with more than one motivation type. These proportions represented the majority of students, though the proportion of students with ties needed addressing before analysis continued to ensure trustworthiness in the data collected.

It would have been possible to have the R code distribute students according to the most autonomous or least autonomous motivation type among the tied types, however this would likely not represent a realistic distribution of students between the motivation types at each point. For example, it was unlikely that students who tied between intrinsic motivation and at least one other motivation type were all experiencing primarily intrinsic motivation, or conversely, that none of them were. Instead, students were distributed randomly into one of the motivation types that they had been associated with, and consistency of this distribution was introduced through use of a random seed. In order to ensure that a random seed-based distribution did not also lead to unrealistic distributions, the same distribution code was run three separate times with three different random seeds. Use of the random seed distribution method also ensured that the tied motivation types that students aligned with were approximately evenly represented. Once the students had been distributed each time, a Chi Square test was used to determine whether there was a statistically significant difference between these distributions (Cohen, Manion & Morrison, 2018; Franke, Ho & Christie, 2012). A low Chi Square value and high p -value (i.e. close to 1)

would indicate that there was no statistically significant difference between the different random distributions.

Data collection point	χ^2	p
1	0.994	0.998
2	1.105	0.998
3	0.786	0.999

Table 3.5 - Chi Square values demonstrating the (lack of) statistically significant difference between distributions of students among tied motivation types

As Table 3.5 above shows, at all three points in the year, the Chi Square values returned were low, and all three p -values were very close to 1. These results demonstrate that distributing students randomly between the motivation types where they had ties between more than one motivation type could not reasonably hinder the trustworthiness of the findings relating to student motivation types. To best represent the motivation types that students aligned with, the mean of the number of students aligning with each motivation type at each point in time was calculated, and where necessary, rounded to the nearest integer. These mean values and the corresponding analysis can be found in Chapter 4 Target Grade Affinity and Autonomous Motivation Levels, and more data relating to the tie-breaking method used can be found in Appendix D: Statistics Summary Tables.

3.6.2 Inferential statistics from the SRQ-A

The use of R continued when finding inferential statistics about the quantitative data. There were several hypotheses tested using the inferential statistics. Table 3.6 below gives the null & alternative hypotheses that were tested, and the inferential statistics used to do so. Since some of the inferential statistics tests assume that the data is distributed normally, tests for skew and kurtosis were conducted. Using the *dplyr* package, the Shapiro-Wilk (W) test was also conducted (Cohen, Manion & Morrison, 2018; Montor-Pozos & González-Estrada, 2024; Shapiro & Wilk, 1965). This test, which can be considered appropriate for the sample in this study (Shapiro & Wilk, 1965) was used to provide additional context for skew and excess kurtosis for the mean values of both RAI and TGAI across the year, to supplement the skew and excess kurtosis, which were also calculated independently. The value for skew would confirm whether the data was even each side of the mean (rather than skewed on either side) and again, a value of 0 would indicate normal distribution. Excess kurtosis would indicate whether the distribution was ‘flat’ (platykurtic) or highly peaked (leptokurtic). Since

(regular) kurtosis expects a value of 3 for normally distributed data, excess kurtosis was calculated instead, i.e. $K - 3$, whereby a value of $K = 0$ would indicate no kurtosis (i.e. a mesokurtic curve). The values calculated for skew and excess kurtosis are provided in the next chapter, before the continued quantitative findings. These statistics in tandem will be provided to show whether the data can be considered normally distributed, close to normally distributed, or not normally distributed at all.

Independent variable	Dependent variable	Research question(s)	Null hypothesis (H_0)	Alternative hypothesis (H_1)	Test(s) conducted
RAI, TGAI	N/A				Shapiro-Wilk (W) test for normality
RAI	TGAI	1, 2	Motivation type has no bearing on target grade affinity	The more autonomously motivated a student is, the higher their affinity to target grade use	Linear regression analysis Spearman's Rank Correlation Coefficient (SRCC) Test for significance (p -value); $\alpha = 0.05$
Mean target grade	TGAI, RAI	2	Students' affinity towards target grades is not affected by their actual target grades	Target grade affinity increases as mean target grade increases	Single linear regression <i>and</i> multiple linear regression & SRCC Test for significance (p -value); $\alpha = 0.05$
Time	TGAI	3	Target grade affinity is unaffected over the course of the year in which the study took place	Target grade affinity increases over the course of the year	t -test for dependent means Test for significance (p -value); $\alpha = 0.05$
Time	RAI	3	For each student, their RAI will not change through the year	RAI increases for each student through the academic year	t -test for dependent means Test for significance (p -value); $\alpha = 0.05$
Time	Motivation type	3	Motivation types of students do not typically change	Motivation type becomes more autonomous over the year	Stuart-Maxwell test Test for significance (p -value); $\alpha = 0.05$

Table 3.6: Summary of the inferential statistics used for hypothesis testing in response to the research questions, to be triangulated with qualitative data for analysis

The primary inferential statistic was a linear regression analysis to determine the extent to which the mean value of RAI for a given student predicted their TGAI value. Following this calculation, a multiple linear regression was then conducted to identify the degree to which TGAI values could be predicted by the combination of mean value of RAI and their mean target grade. The multiple linear regression was conducted following the first (singular) linear regression in order to attempt to explain the relationship between target grades and motivation to a greater extent. When considering whether to include the multiple regression calculations, Salkind (2008) recommends including only independent variables that may have a bearing on the dependent variable. Since students' motivation according to the use of target grades *may* have been affected by the target grades they had been issued, this was determined an appropriate calculation to make in contributing to Research Question 1, relating to whether students find their target grades motivational.

For both relationships being tested as part of the linear regression tests, the probability of rejecting the null hypothesis in the case that it is in fact true (*p*-value) (Cohen, Manion & Morrison, 2018) will be calculated. Whilst the expectation was that the null hypothesis will hold true in all four cases, it would not be acceptable to assume that these are true despite the arguments that calculating *p*-values is a flawed practice (for example see the summary in Cohen, Manion & Morrison (2018, p. 752)).

Additionally, a *t*-test for dependent means was also conducted. Despite being in two separate year groups, all of the student participants were considered 'Key Stage 4 students' and were completing their GCSEs, so were not considered as separate groups. The purpose of the use of this test specifically was to account for the following conditions (according to Salkind (2008)): a single group is being studied under different conditions, and at two points in the year following the use or non-use of their target grades by themselves or their teachers. The test aimed to answer Research Question 3 relating to whether students' motivational types and perceptions of the use of target grades changed over the course of the year. As such, the *t*-test was conducted for both the RAI values and the TGAI values calculated between the first and third SRQ-A rounds such that the difference between (near) the beginning of the academic year could be compared with near the end of the same academic year.

Finally, to indicate the extent to which the motivation types of students changed over the course of the year, the Stuart-Maxwell test (Maxwell, 1970) was conducted. This test was chosen for several reasons. Firstly, the change in motivation types of each student could not be measured using the paired *t*-test for dependent means since these data were categorical, but this test still accounted for the dependence of the data, i.e. the two motivation types were from the same student participants, and therefore dependent. Whilst a Chi-square test would describe the extent to which the categorical data changed, it would not have accounted for the paired and dependent nature of the data (Maxwell, 1970).

3.6.3 Reliability and validity of SRQ-A quantitative data collection

Reliability describes the extent to which the measurement tools used in the study worked as a measurement tool every time it was used. In this study, this meant the extent to which the SRQ-A consistently produced data relating to the academic motivation, and specifically the impact of target grades on their academic motivation, of the students who participated in the study. To ensure the reliability of the quantitative data collected, Cronbach's alpha statistic was calculated using R (Salkind, 2008; Cohen, Manion & Morrison, 2018). This statistic was used as an internal consistency measure, demonstrating the extent to which the test scores were consistent within each SRQ-A that each student participated in. In the context of this study, for a given student participant, identifying the extent to which their responses were consistent in their responses for a single SRQ-A participation. It was expected that for the four items relating to each motivation type (each of which is considered a 'latent variable'), there should be a high level of internal consistency. Latent variables are variables that can be inferred indirectly; the four items relating to each motivation type combine to provide confidence in the degree to which a student associates with the relevant motivation type. For example, if a student responds positively to all the statements associated with identified motivation, a researcher could infer (with some confidence) that the student experiences identified motivation. Given that Cronbach's alpha relies on each item tested measuring only a single latent variable (in this case, motivation type), the measure was calculated for each of the four motivation types as well as amotivation. A mean value of Cronbach's alpha was then calculated. The values found for each motivation type for each year group at each point can be found in Appendix D: Statistics Summary Tables. Since the

scale of potential values calculated ranges from 0 to 1, the closer the value is to 1, the higher the internal consistency, where a value above 0.7 can be seen as acceptable.

To reduce (systematic) error in the responses given by students each time they completed the SRQ-A, several measures were taken that have been discussed in Section 3.4.1 describing the setting students completed the questionnaire in. Examples of these included providing form tutors with instructions to read to their pupils, and ensuring students completed the questionnaires in silence and without the support of their peers. Whilst it is impossible to remove all potential for error, these conditions for SRQ-A completion helped to reduce the potential error that could occur, thus increasing the reliability of the findings.

Validity refers to the extent to which a test does what it is supposed to do. In the case of the SRQ-A, the majority of the questionnaire had been validated previously by Ryan and Connell (1989), demonstrating in part that the students understood the items and were able to freely respond to them without support. For the items in the SRQ-A which had not been validated by Ryan and Connell (1989), these statements were considered appropriate for use in the research given their trustworthiness, based on the steps that were described in section 3.5.2.

3.6.4 Latent Thematic Analysis of Focus Group Data

To analyse the data collected from the four focus groups conducted during the study, a latent thematic analysis method was used. Braun and Clarke (2006) argue that there are two 'levels' that thematic analysis can take place at. The first of these is the semantic (explicit) level, where the underpinning meaning of speech is not considered, but simply what the speech explicitly means. However, the second 'level', latent (interpretative) thematic analysis means that there is an attempt to go "beyond the semantic content of the data, and starts to identify or examine the *underlying* ideas, assumptions and conceptualizations... that are theorised as shaping or informing the semantic content of the data" (p. 84). Whilst in this study, there is consideration of the explicit meaning of students' speech during the focus groups (leading to the deductive theoretical approach), there is also consideration of concepts that underpin these ideas, leading to the quasi-inductive approach described below.

Following each focus group, a deductive, theoretical approach was taken based on the pre-existing codes from SDT (Ryan & Connell, 1989). The codes used were 'autonomy', 'competence', 'relatedness' and 'target grades'. The first three codes derived specifically from SDT as discussed in the Literature Review (see Ryan & Connell, 1989), and the final code was derived from the research questions and aims of the study and so was appropriate for this specific study. The transcript for each focus group was written by Microsoft Word, which has an auto-transcription feature using the audio recorded during the focus group. These transcripts were then edited to match the actual speech during the focus group, and they were checked to ensure that each part of the speech was attributed to the correct speaker, and then the speaker names were replaced by pseudonyms to ensure the speakers could not be identified. Each transcript was then duplicated and named with each of the four codes. For each of the code-named transcripts, any speech that was not relevant to that code was deleted from the transcript (in that transcript only): this process was then repeated for each of the remaining three codes, and for each focus group.

Subsequent to the production of each document for each focus group's code, each statement within the document was then sorted by sub-code. The coded transcript was duplicated, and the sub-codes were produced on the duplicate to preserve the original coding document. When reading a quote, it was determined whether it would fit into a sub-code that had been created for a previous statement by a student, or whether a new sub-code needed creating for that statement (that further statements could be added to later), and this process was repeated until reaching the end of each coded transcript. The sub-code names give the general message behind the quote in a few words. Some examples for this include, for the second Year 10 focus group transcript coded for competence: 'self-set competence benchmarks', or 'target grades don't match perceived competence'. Whilst some sub-codes found themselves with only a single quote, there were many sub-codes that contained more than one quote, and some sub-codes had many quotes attributed to them, often from multiple points in each focus group. The quotes were grouped in this way to help identify threads throughout that focus group, and helped to reinforce the extent to which a student (or multiple students) had a specific opinion or had had a specific experience. It would be worth noting that often the sub-codes under the 'relatedness' code for each focus group did not necessarily relate explicitly to students' experience of relatedness, but where students

indicated that they had had a similar experience. Finally, once the coded transcript had been sub-coded, some summarising comments were written about each sub-code to distil the data that the students had provided, and to assist with the understanding and importance of each sub-code. A few of the summarising comments were supported by additional context. As with the coding of the data, the process of sub-coding and adding comments was then repeated for each coded transcript, and for each focus group.

Concurrently with, but primarily after the deductive process described in the previous paragraph, a quasi-inductive approach to qualitative analysis was used. An inductive approach has similarities with grounded theory (Braun & Clarke, 2006) in that this allows for theory building based on the raw data, and is not based on a predetermined framework, which in this case was SDT. During the deductive analysis, statements that indicated meaning that appeared in multiple locations were identified and grouped together. In some cases, these statements did not directly relate to the SDT framework that the deductive process took place within. For example, multiple students discussed their plans for beyond their education, or referenced them (and this is discussed further in chapter 4), so the combination of these statements provides a theme worth considering beyond the original framework. Whilst this process did occur to an extent during the coding and sub-coding of each focus group transcript, this also took place later when the sub-codes from one focus group were being compared with sub-codes from the others. This has been considered quasi-inductive given that a traditionally inductive approach has not been taken due to the more rigid deductive process based on SDT, however the use of induction to identify further themes that may contribute toward answering the research questions were considered important.

Whilst the deductive coding of each transcript took place, along with sub-coding and producing summary comments, an abductive approach was also taken; Timmermans and Tavory (2012) propose that abduction comes from the “social and intellectual positions” (p. 167) of a researcher, and so this approach allows for the addition of context to the analyses that have taken place through the deductive and inductive methods explained above. During the writing of summary comments for each sub-code in each coded transcript, relevant information relating to the context that the students were talking about was added where necessary and appropriate. This context came from researcher knowledge of both the setting in which the study took place and, to a more limited extent, of the students who participated

in the focus groups. Knowledge of the setting helped to add further perspective to teachers' use of processes in the school such as the issue or reference to target grades, or the structure of grade reports that were used to provide parents with information about their child's academic performance. Further, the use of abduction allowed for explanation of some of the statements that students made, where someone may not have understood what the student meant without having some background knowledge of the school. In some cases, where students said things that they incorrectly believed to be accurate, these were highlighted. Such examples of statements like these are discussed in chapter 5, Pupil Perspectives on Target Grade Use.

3.6.5 Triangulation of data from SRQ-A and student participant focus groups

Triangulation is the process of using more than one data set to answer a given question (Cohen, Manion & Morrison, 2018). This study used both quantitative data from the SRQ-A as well as qualitative data from focus groups with samples of students who participated in the SRQ-A. The use of these two data sources meant that not only could conclusions be drawn, but there was scope for consideration of the extent to which the findings from each source aligned with each other. Triangulating data from these two sources assisted in answering all three research questions.

The first research question addresses the extent to which students perceive their target grades as motivational. The use of the SRQ-A highlighted the motivational type that each student most associated with their target grades and their potential motivational effect, and additionally provided the TGA1 statistic (defined in section 3.5.1) indicating the extent to which each student was autonomously motivated by their target grades, or whether they experienced controlled motivation or amotivation based on their target grades. However, the focus group statements helped to provide context to those quantitative findings. Once the TGA1 for each student had been calculated, the focus group responses under the 'target grades' code were used to identify the extent to which the statements from pupils relating to their target grades supported the motivation students experienced according to their SRQ-A responses.

The second research question asked about the type of motivation students experienced and the extent to which that aligned with their perception of target grades. Quantitatively, this meant identifying the correlation between each student's RAI and TGA scores using the SRCC (see section 3.5.1), but again the focus group responses provided by the students were used to provide additional clarification to these statistics. This research question went beyond simply whether target grades are motivational but also considered the relationship between general academic motivation and their affinity towards, and motivation due to, their target grades. The responses from students in the focus group provided additional clarity on this relationship, explaining why students may have responded the way they did in the SRQ-A.

The final research question asked if students' motivational types and perceptions of the use of target grades altered over the course of an academic year. The primary method of measuring this change depended on the results of the *t*-tests for dependent means, which were calculated for each year group following the first and last SRQ-A round. Whilst the descriptive statistics (including the abundance of each motivation type) calculated from the SRQ-A were also able to show any change over time simply by comparing mean values, comparison of qualitative statements on various topics were also compared. As a result, any general changes that became apparent through each method could be compared to identify any potential relationship between them, and the degree to which the qualitative statements agreed with the values calculated by the *t*-tests could be identified.

Whilst comparing the findings from each of the data sources helped contribute towards answering each research question, this process of comparison also allowed for additional verification of the extent to which the data were trustworthy. For example, the students participating in the focus group were randomly chosen from within the sample of students aligning with each motivation type, and so trustworthiness could be assessed by the extent to which the SRQ-A responses for one of the participants aligned with quotes given during the focus group.

3.7 Ethical Considerations

In this section, various potential ethical issues are discussed, and where appropriate the steps that were taken to mitigate or account for these potential issues, including the theme of power in relationships, potential influence I may have had on the responses from participants (and therefore the findings), and the protection of privacy of participants.

It should be noted that ethical approval for this study was sought from the Strathclyde Institute of Education Ethics Committee, and this was approved. The approved ethics form can be found in Appendix C: Approved Ethics Form.

At the same time as consent was being gained from the university's ethics committee, consent to conduct the research was (verbally) approved by the school's senior leader with responsibility for safeguarding after a conversation about what the research would entail. They were surprised when I said I would also seek consent from the students' parents/guardians, saying that the parents/guardians were aware the school may do research with their child such as collecting feedback in focus groups or through surveys. Finally, once in the room, the students were told they had the right to refuse to participate should they have wished, and they were reassured there would be no repercussions for this whatsoever.

Box 3.3 - Consent from school leadership for the study

3.7.1 Dual Roles as Teacher and Researcher

Given that I was an established member of staff within the school at the time of the study, there was the possibility of issues of power in relationships between myself as a teacher at the school (in addition to being the researcher), and the student participants. During the SRQ-A stage of the research (see section 3.5.1), this was unlikely to have been an issue. However, during the focus groups, students may have responded differently depending on their relationship or perception of me. To try to minimise any changes here, the students were encouraged to be honest, and that their views would not be shared by me, nor would their responses have any impact whatsoever on the way they are treated in school. Additionally, one student specifically asked if what they said would be relayed to their teachers, and was reassured it would not. It should be noted that students were told as part of the focus group preamble that, as with any other school-based setting, any safeguarding

issues would be reported using the usual channels as described in the school's safeguarding policy, though none of the student participants demonstrated surprise through their body language at hearing this. Further, I was aware of the body language I exhibited whilst students talked as to not encourage any particular responses, keeping an open mind and encouraged students to speak openly by nodding and using short encouraging phrases. I also made use of a reflective field journal after each focus group. This reflective field journal allowed me to be more aware of my own feelings during the research so that I was later able to address any impacts I may have had on the data collected. The use of the prompts during the focus groups meant that there was increased consistency in the delivery of each focus group across the academic year.

In addition to the potential issues relating to students' responses with their perspective of me primarily as a (or their) teacher, there were also potential power relationships with the teacher participants. Given that one of the participants was a senior leader, and another a middle leader, both had more oversight over processes across the school and had a higher 'rank' and so could have been reluctant to share the thinking behind decisions made by the leadership team around target grades and students' academic motivation. However, reminding them that their participation would be pseudonymised and details about their position would be kept private, and that my behaviour would not change because of anything they had said. This reassurance helped to ensure the participants felt comfortable being honest about their views on the topics of each question and the ensuing discussions.

3.7.2 Anonymity and Pseudonymity

Whilst every effort was made to maintain anonymity of all participants, given the nature of the research (i.e. within a relatively tight-knit school community), there was a possibility of anonymity not being maintained within the school community. This may have occurred through participants (students or teachers), sharing their responses or discussing their participation in the research with others. This was discouraged during each focus group and interview by reminding the participants that the focus group as designed to be a place to share their views and experiences candidly, and that they should not have shared the experiences shared by their fellow participants. It was also made clear that this would help to

ensure that trustworthiness of responses in future focus groups, since the participants would have been less inclined to share their views if they were under the impression their views were not being kept anonymous. Further, once the data had been collected following each data collection point, the students (if not already) were issued a unique identifier (UI). Then, a separate document was created to match the students' names with their UI. The teachers that participated in interviews and the students who additionally took part in the focus groups were then issued pseudonyms. This assisted in avoiding students or staff being identifiable when quoted in chapter 5.

The other main risk for teaching staff was that in order to take part in the semi-structured interviews, they needed to agree to give up some of their time during, or just before or after, the working day. Given the already-high teacher workload, I made sure that the teachers selected to participate were able to choose a time that suits them as best as possible, and that they had plenty of warning. I also ensured I was flexible with my own time, so that the participants could change the time with short notice if they felt like they needed to (though this did not occur). Since it could be considered an ethical issue (Cohen, Manion & Morrison, 2018) to waste the time of participants, I was wary of excluding the data collected from the study. Whilst conclusions were not drawn solely from these data, quotes from the teachers are used in chapter 4 to help provide additional clarity to comments from students during the focus groups.

3.7.3 Reflexivity and Influence on findings

There was a potential for my position at the school, the positions I held on the use of target grades (and other factors discussed during focus groups) and my professional knowledge relating to the school may have influenced my behaviour during this investigation. By considering my own experiences and how they may have affected my expectations of the findings, I practiced critical reflexivity throughout the investigation in order to acknowledge any potential influence I may have introduced toward any expected results. The use of the reflective field journal helped to achieve this: I was able to consider why a student or teacher participants might have said what they said, and how the fact that I'm the researcher (as opposed to someone else) could have been influencing this. The co-investigators (supervisors) also played a role in helping to account for potential influences I could have had throughout

the research. To start, this meant frequent discussion about the decisions that I made (for example in data analysis, which was discussed in section 3.6). This helped to ensure consistency in use of data. Our regular supervisory meetings provided opportunities for guidance and collaboration, and allowed for explanation and justification of decisions that were made to reduce the effect of my personal opinions or experiences on the interpretation of the data.

3.7.4 Ethical Guidelines

It was imperative that any research considered any ethical issues which may have arisen and ensured that it did not deviate from ethical guidelines. There were a few potential issues concerning ethics in this study. These are outlined in the table below and are based on the ethical guidelines from the University of Strathclyde Code of Practice on Research with Humans, and BERA (2018).

Factor	Consideration	Preventative actions
Consent	All participants, regardless of age, needed to be aware of what the study aimed to find out, and may (or may not) have consented at their will. For underage participants, their adults also could consent through not opting their child or ward out.	Before any participation in the research, the prospective participants were required to consent to participating. In the case of the underage participants, adult consent was gained beforehand as well.
Transparency	For consent to participation to be legitimate, participants (and their adults, where necessary) must have been aware of the study in its entirety, including how data would be analysed.	At the point of consent, participants (or their adults) were made aware of the aims of the research, what data would be collected, and how that data would be analysed and used, before deciding whether to consent.
Right to withdraw	Participants needed to be allowed to withdraw their consent to participation at any point, including withdrawal of consent for the use of any data they have provided.	Participants were made aware beforehand that they maintain the right to withdraw at any stage in the research. Collection of identifying information would allow for the destruction of

		specific items of data from specific participants if required.
Incentives	I needed to consider whether incentivising participation would be reasonable for this study.	To reduce any additional bias by participants in order to earn incentives, there were no incentives used for participants during this research.
Harm arising from participation	Participants needed to be aware of any harm that may come to them during the research.	No harm would come to participants over the course of this research: there were no physical demands for participants, and any responses to other methods were kept confidential to avoid other forms of harm. Additionally, the nature of the research did not include anything that could be considered sensitive, further avoiding potential harm of any nature.

Table 3.7: Details of potential ethical issues, and the preventative actions taken to ensure alignment with ethical guidelines.

3.8 Conclusion

This chapter aimed to detail the specific methods that were used in this study to address the research questions outlined, designed based on the literature review in the previous chapter. The first research question (relating to the extent to which students perceive target grade use by teachers as motivational), was addressed through the use of the SRQ-A psychometric test questionnaire, to determine the type of motivation experienced by each student in relation to their target grades, and the focus groups helped to contextualise the students' responses to the SRQ-A. The second research question (relating to the motivation type students experienced and how this related to their perceptions of target grade use) was also addressed through the use of the SRQ-A, based on the extent to which students' relative autonomy indices (RAI) correlated with their target grade affinity indices (TGAI). Finally, the third and final research question, relating to whether these perspectives changed through the year, were addressed by considering how the responses to the SRQ-A and focus groups changed through the year; the Stuart-Maxwell test and *t*-tests for dependent means were the statistics chosen to demonstrate any potential differences.

In the following two chapters, the quantitative and qualitative findings (named Target Grade Affinity and Autonomous Motivation Levels, and Pupil Perspectives on Target Grade Use, respectively) are outlined in detail, following the analysis process described earlier in this chapter. The findings outlined in Chapters 4 and 5 are triangulated and discussed in relation to the literature in chapter 6 Discussion.

4 Target Grade Affinity and Autonomous Motivation Levels

4.1 *Introduction*

4.1.1 Introduction

In this chapter, the analysis from the quantitative data collection is presented. These data are organised by the measure calculated, including all of the statistics calculated in relation to that measure.

The findings relating to the TGAi measure in section 4.2 indicates the extent to which students are intrinsically academically motivated by their target grades, where a value of 0 indicates that there is no effect on academic motivation, a value < 0 indicates the induction of extrinsic forms of motivation, and a value > 0 indicates intrinsic forms of motivation induced from target grade use. This chapter will detail the findings that, on average, students are roughly ambivalent to target grade use with mean TGAi values for the participating students close to 0 at all data collection points. Subsequently, the RAI measure calculated indicates the extent to which students are intrinsically academically motivated in general; section 4.3 shows that students' academic motivation is well-spread along the scale given by Gagné and Deci (2005), with a mean RAI value less than but close to 0 at all data collection points. In section 4.4, the linear regression models used to describe the relationships between TGAi and both RAI and students' mean target grades, both independently and together, are described. Finally, before concluding the chapter, section 4.5 gives the findings relating to students' motivation types and their spread, aligning with the RAI values described in section 4.3. In relation to the third research question, each section describing the findings for each measure also describes the change in that measure over the course of the year.

4.1.2 Internal Consistency and Normality of Data

As described in the Methods chapter, Cronbach's alpha was used to determine the internal consistency of the data collected. The alpha values calculated related to each motivation type at each data collection point for each year group. Taking a mean of all of

these values led to a value of 0.812. This is close to 1.0, so can be described as a good degree of internal consistency (Kamis & Lynch, 2020). The table of all of the values calculated can be found in Appendix D: Statistics Summary Tables, in Table 12.1.

Further, a number of the measures calculated, and statistical tests used, depend on the data being normally distributed. As such, the values for skew and excess kurtosis are provided in the table below, as is the Shapiro-Wilk statistic and associated p -value (Montor-Pozos & González-Estrada, 2024; Shapiro & Wilk, 1965), indicating that there is a statistically significant deviation from a normal distribution.

	Year 10 <i>N</i> =247				Year 11 <i>N</i> =241			
	Skew	Exc. Kurt	<i>W</i>	<i>p</i>	Skew	Exc. Kurt	<i>W</i>	<i>p</i>
RAI mean	.431	.976	.979	<.001***	.411	1.04	.982	<.001***
TGAI mean	.184	.986	.973	<.001***	.726	2.30	.946	<.001***

Table 4.1 - Table of skew, excess kurtosis, Shapiro-Wilk statistic and associated p -value for mean RAI and mean TGAI values for both year groups

Examining the normality for year 10, the Shapiro-Wilk test statistic, despite not being normally distributed (according to the $p < 0.05$) returned a W value very close to 1.0 which indicates that the distribution can be considered very close to normal. This is supported by the values for skew and excess kurtosis indicating that these data are approximately normally distributed. The positive value for excess kurtosis indicates that all four distributions are leptokurtic (i.e. they are highly peaked and have heavier tails), which is likely influencing the result from the Shapiro-Wilk tests. This means that there is a higher concentration of students with TGAI or RAI values close to the mean, and there is a higher proportion of outliers. One could conclude therefore that these distributions are mildly non-normally distributed, affected primarily by the leptokurtosis.

For the year 11 students, the distribution of RAI mean values could arguably follow the same arguments as for year 10 above, whereby the data is close enough to a normal distribution for the inferential statistical tests to still hold true; the values for skew are relatively low, and the leptokurtosis is not large enough to warrant the non-use of the parametric statistical tests used. However, for the mean TGAI values, the larger leptokurtosis

and $p \ll 0.05$ suggests that these data for this specific measure are further from being normally distributed. According to Cohen, Manion and Morrison (2018), the leptokurtosis in all of these data is “not such a problem” (p. 736) given the acceptable values for skew (i.e. $-1 < skew < 1$), as well as all four $0.9 < W < 1.0$. When considering all of these statistics in context, as well as the Q-Q plots and histograms that can be found in Appendix E: Visualisations of Data Collected, we can consider all of these data approximately normally distributed. Given that t -tests for dependent means and linear regression are both robust to mild non-normality (Cohen, Manion & Morrison, 2018), the parametric tests chosen (see chapter 3 Methods) and subsequently used can still be considered trustworthy.

4.2 Target Grade Affinity Index (TGAI)

In this section, the statistics related to the TGAI measure are described. This includes the measure of TGAI values, how the TGAI values changed over time and the relationship between the TGAI measure and students' mean target grades. How students' TGAI scores associate with their relative autonomy index (RAI) scores is outlined after, in section 4.3, covering the data related to RAI scores in more detail.

4.2.1 Measurements of TGAI

In this section, the quantitative findings and analysis is presented regarding the motivational impact of target grades from the perspective of students. As discussed in chapter 3 Methods, this section presents the distribution of Target Grade Affinity Index (TGAI) scores for students in both year groups at each data collection point in the year, as well as the mean distribution for the year as a histogram. The TGAI indicates the extent to which students are motivated to make their own choice to work towards (or perhaps exceed) their target grades. As a TGAI score for a student increases, the greater the extent to which they are motivated by their target grades.

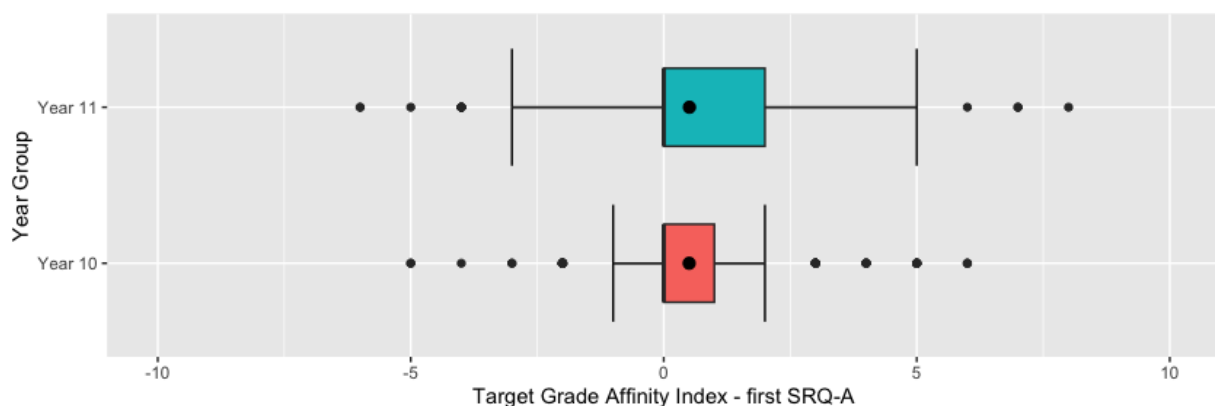


Figure 4.1 - Boxplot showing the distribution of TGAI values for year 10 students following the first SRQ-A

The TGAI values boxplot for year 11 above had a mean value of 0.51 and a standard deviation of 2.09, and for students in year 10 the TGAI values had a mean value of 0.50 and a standard deviation of 1.89. The high prevalence of students in both year groups with a TGAI value of 0 meant the first quartile value was equal to the median value. Despite the outliers shown for both year groups, most students fell into the [0 : 2] range for year 11, primarily indicating ambivalence toward target grade use. The wider spread of values (including the

outliers) supports the higher value of leptokurtosis described in subsection 4.1.2, compared to year 10. Year 10 students had a smaller spread of TGAi values, with most students falling into the $[0 : 1]$ range, again showing a mildly positive affinity toward target grade use. The maximum and minimum values for TGAi also had a lower magnitude for students in year 10. Given that for year 10, both the range and the range including the outliers were smaller than for year 11, this would indicate a lower spread of perspectives on the use of target grades. Additionally, for both year groups, the outliers are evenly spread either side of the majority of the TGAi values; that is that the students' perspective of the use of target grades as a motivational tool, despite a mean value above 0, is ambivalent.

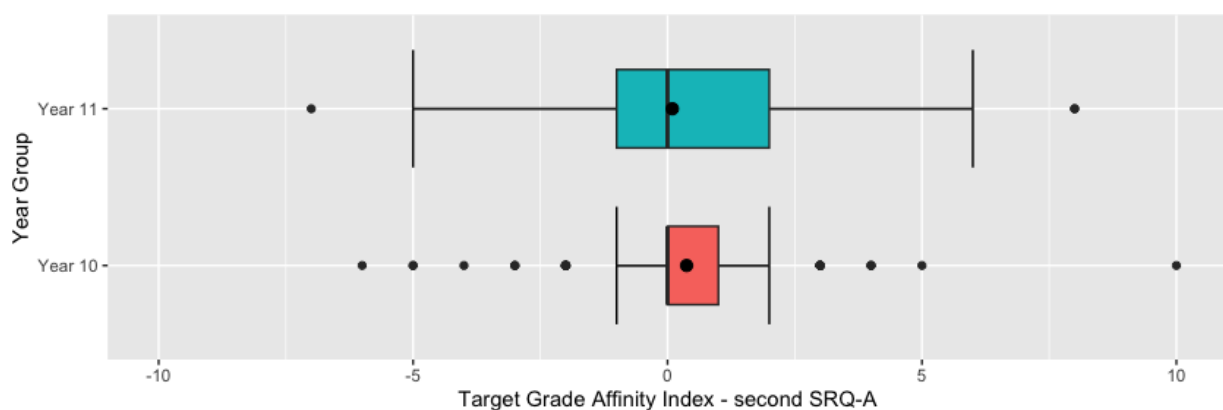


Figure 4.2 - Boxplot showing the distribution of TGAi values for year 10 students following the second SRQ-A

The second TGAi values boxplot for year 11 students above had a mean value of 0.09 and a standard deviation of 2.30, and for students in year 10 the TGAi values had a mean value of 0.38 and a standard deviation of 1.81. Despite the outliers, most year 11 students fell into the $[-1 : 2]$ range, still indicating ambivalence toward target grade use, but less so than from the first SRQ-A, with a similar leptokurtic distribution as before. For year 10 students, most fell into the $[0 : 1]$ range, once again demonstrating smaller range of values (except for the outlier with a TGAi value of 10), and holding the same range of values as in the first round of data collection indicating a similar strength of feeling, or rather a lack thereof, toward target grade use for this year group.

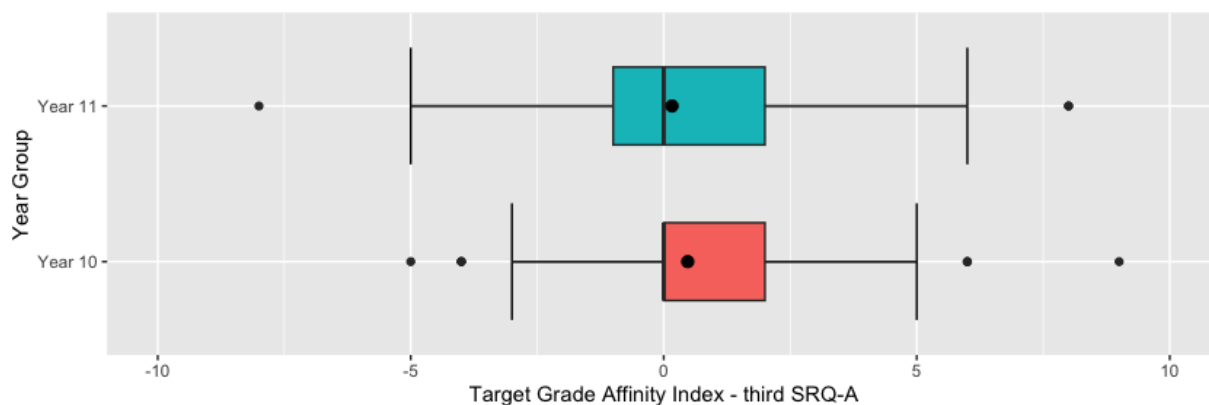


Figure 4.3 - Boxplot showing the distribution of TGAI values for year 10 students following the third SRQ-A

The third and final TGAI values boxplot for year 11 students above had a mean value of 0.28 and a standard deviation of 2.65, and for students in year 10 the TGAI values had a mean value of 0.59 and a standard deviation of 2.25. The year 11 boxplot also shows only two outliers, with most students still falling into the $[-1 : 2]$ range. Whilst the range of values aligns more closely with the second round of data collection, the increase in mean value suggests that the reduced motivation students experienced based on their target grades reversed. Additionally, the larger standard deviation and the more-than-doubled excess kurtosis value (again indicating leptokurtic distribution) supports that the perspectives of year 11 students are still considerably varied. Again, the year 10 students returned a smaller range of values than year 11, with most students falling into the $[0 : 2]$ range. These values indicate a mildly more positive affinity toward target grade use for year 10 students compared to previous rounds of data collection, though both year groups were still primarily ambivalent to target grade use. Despite still having a smaller range than for year 11, the spread for year 10 students increased and suggests a wider range of perspectives on the use of target grades as a motivational tool in both directions, though with more students moving towards a positive perspective. At all three points of data collection, the measures of central tendency indicate ambivalence toward target grade use, though the spread of data, along with the outliers visible in Figure 4.1, Figure 4.2 and Figure 4.3, also support that there is likely some nuance to this average ambivalence. The range of perspectives represented by this quantitative data is considered in section 5.1, and discussed in the Discussion chapter (primarily sections 6.2 and 6.3).

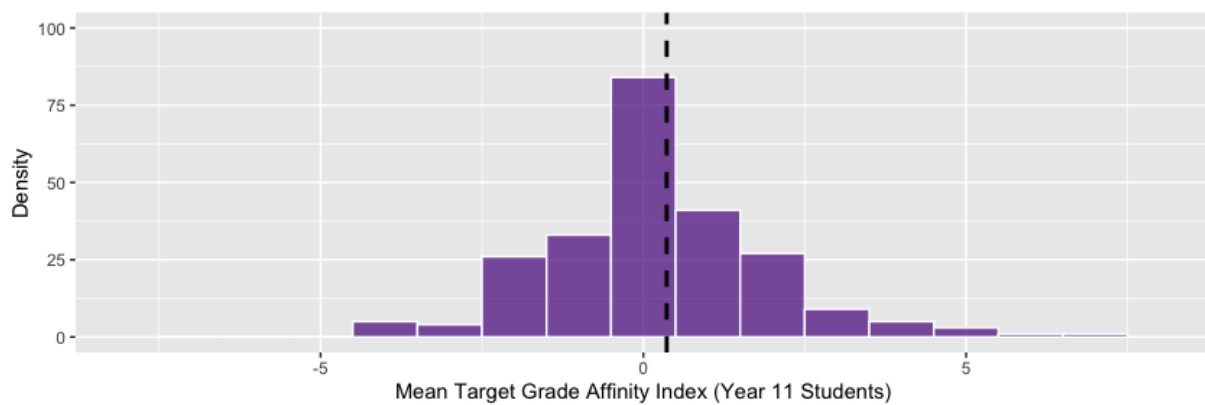


Figure 4.4 - Histogram of the mean Target Grade Affinity Index for Year 11 students over the year

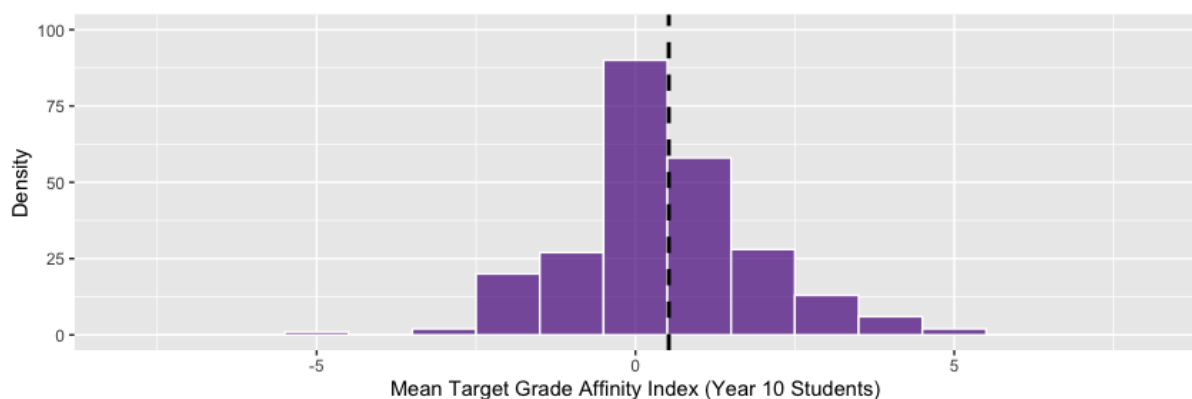


Figure 4.5 - Histogram of the mean Target Grade Affinity Index for Year 10 students over the year

The histograms in Figure 4.4 and Figure 4.5 above demonstrate the distribution density of mean TGAi values for students in each year group throughout the year. For year 11 participants, despite the leptokurtosis and mild positive skew, these data can be considered approximately normally distributed based on the low skew. The year 11 values returned a mean value of 0.362 (shown by the black dashed line), the median value at 0.000 and a standard deviation of 1.77. For students in year 10, the mean TGAi value for each student these data can also be considered approximately normally distributed (in accordance with the values for skew and excess kurtosis shown in subsection 4.1.2, and the high W value). The distribution of mean TGAi values for year 10 indicates a marginally higher degree of affinity (though still primarily ambivalence) toward target grade use and supports the reduced spread seen in the data from the individual data collection points, similarly to year 11. The median of the mean TGAi values for year 10 was 0.333, the mean was 0.522 and the standard deviation was 1.45. These visualisations help to demonstrate the mean spread of data, showing a lower spread for year 10 and a higher spread for year 11, supporting the greater range of perspectives provided by students in year 11. Measuring by either median or mean,

the students in year 10 felt more positively about target grade use as a motivator compared to year 11 students, though the measures of central tendency still being close to 0 supports the point above that students are largely ambivalent about target grade use. Both sets of data show a mild positive skew, showing that there are more students with outlying high values of mean TGAI.

4.2.2 Change in TGAI over time

The third research question related to the extent to which TGAI, RAI and motivation type changed over time. Despite the leptokurtosis shown in subsection 4.1.2, the t -test being robust to mild non-normality means these tests were still appropriate for these data.

For the TGAI values over the course of the year, boxplots showing the distribution of these values can be found in the previous subsection. After conducting a paired t -test for dependent means for the TGAI between the first and last SRQ-A tests conducted using data from year 11 students that had completed both questionnaires, $t = 0.45$ was returned, indicating a small change over time. This test also returned $p = .327$, which is greater than the α significance level of 0.05, indicating a non-statistically significant finding and that the null hypothesis could not be rejected (Cohen, Manion & Morrison, 2018). This means that target grade affinity does not meaningfully change over the course of the year, suggesting that students have a relatively steady perspective on the use of target grades throughout a given year. However, when conducting t -tests for dependent means between the TGAI values at the first point in the year and at the second point in the year, year 11 demonstrated a statistically significant change ($t = 2.351, p = .010$). This supports the point in the above subsection that there was a decrease in the proportion of students that found the use of target grades academically motivating; this represents the largest change in TGAI values in the study. Despite this, conducting a t -test for TGAI values between the second and third points in the year, despite showing a change in the opposite direction, this result was found not to be statistically significant ($t = -1.02, p = .845$). Given that there was no (statistically) significant change in TGAI values for year 11 across the year as a whole (i.e. from the first data collection point to the last), this t -test result showing the change between the second and third point could be described as *important*. The t -value being negative indicates a change in

the opposite direction (i.e. a worsened view of the extent to which target grades act as a motivator).

Similarly, when *t*-tests were conducted in the same way for TGAi values for year 10 showing the change in values from the beginning to the end of the year, the values $t = -0.399$ and $p = .655$ were returned, showing a smaller change over the year than for year 11, and in the opposite direction. Again, since $p > 0.05$, this value fails to reject the null hypothesis that TGAi values remain the same over the course of the year, and again suggests that students held a steady perspective on target grade use through the year. The *t*-tests conducted using data from the mid-point in the year (i.e. between the first and second data collection rounds, and between the second and third data collection rounds) returned $t = 0.397, p = .346$ and $t = -0.272, p = .607$ respectively, again supporting that there was no (statistical or otherwise) significant change in students' perspectives on target grade use during the year.

4.2.3 Summary

In line with the first research question, TGAi values were calculated using students' responses to the SRQ-A questionnaire at three points in the year, for each year group. For year 10, there were no statistically significant changes in their perspectives on the extent to which the use of target grades through the year was academically motivating, though at all three points in the year, the TGAi values calculated were very mildly positive. This held true between the first and second data collection rounds, between the second and third data collection rounds, and across the whole year. For students in year 11, there was a statistically significant reduction in the extent to which they found target grades academically motivating, reducing the mean value to much closer to 0. However, a change in the opposite direction (not found to be statistically significant), as well as the overall change in TGAi values through the year, suggest that year 11 too found target grade use very mildly motivating but that these perspectives did not change overall through the year.

The leptokurtic nature of the TGAi values for both year groups indicates that there are a larger proportion of outliers in the data from year 11. Despite this leptokurtosis, the relatively low values for (positive) skew, combined with the robustness of the inferential statistical tests used in this (and subsequent) sections, means these findings hold despite the

Shapiro-Wilk statistic's suggestion that the data is not normally distributed. However, the data can be considered close enough to the normal distribution that this is not considered a problem (Cohen, Manion & Morrison, 2018). In the next section, the statistics relating to the relative autonomy index (RAI) are detailed, followed by the extent to which RAI and TGAI are related.

4.3 Relative Autonomy Index

Relative Autonomy Index (RAI) indicates the extent to which a student is autonomously motivated. The higher the RAI value, the more autonomous the student's academic motivation. Conversely, the lower the RAI value, the more controlled their academic motivation. This section outlines the values measured for RAI for each year group at each point in the year. This is followed by how the RAI scores changed over the year. Following this section is consideration of how the RAI values are related to the TGAI values, building on section 4.2. For both year groups, the data was found to be mildly positively skewed, and mildly leptokurtic, but is still approximately normally distributed.

4.3.1 Measurements of RAI

In this subsection, the extent to which each student is autonomously motivated is addressed. Each table of summary statistics relating to the distribution of RAI values is paired with two boxplots of the same data (one for each year group), to assist with visualising the distribution. In the boxplots, the coloured region indicates the interquartile range, and the tails at each end indicate the total range. The smaller points outside the range represent individual outliers, and the slightly larger points inside the coloured regions indicate where the mean value lies.

Year group	First SRQ-A data collection round						
	Min	Q1	Mdn	M	Q3	Max	SD
10	-7.75	-3.25	-1.25	-1.40	0.25	7.25	2.69
11	-10.5	-3.25	-1.75	-1.43	0.25	9.00	2.98

Table 4.2 - Table of summary statistics relating to students' Relative Autonomy Indices from the first SRQ-A round for their respective Year Groups

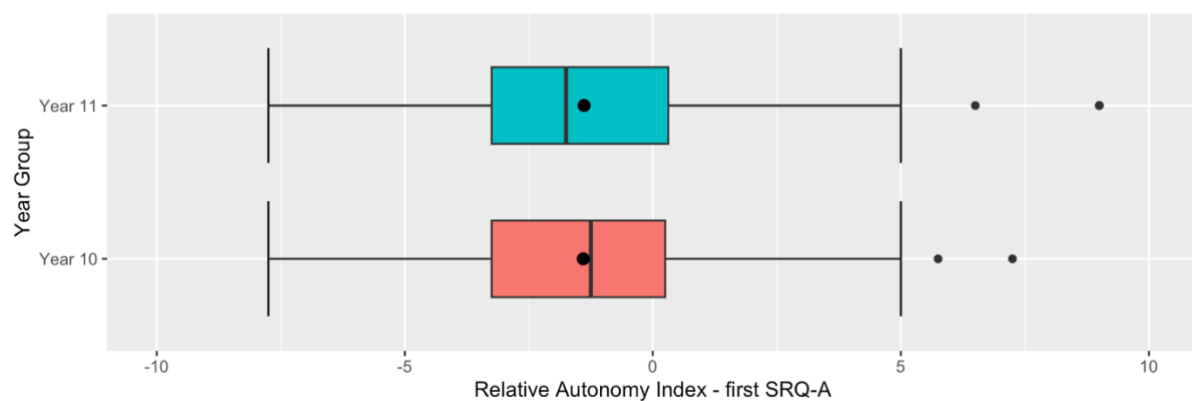


Figure 4.6 - Boxplot of summary statistics for Relative Autonomy Indices from the first SRQ-A round of data collection

The data above provides visualisations of the distributions of the RAI values for students in years 10 and 11. Students' RAI values suggested controlled motivation to a slightly larger extent than autonomous motivation for both year groups. The outliers above the fourth quartile have skewed the mean RAI value upward. The interquartile range of values for year 10 was the same as for year 11, though the smaller total range and smaller standard deviation are also worth noting. The year 10 data also produced a higher median value, and fewer outliers. For both year groups, given that the median value, mean value and the majority of the interquartile range is below 0, the motivation type results above indicate that more students identify more closely with controlled motivation types (i.e. introjected or external motivation) – this is true for students in both year groups.

Year group	Second SRQ-A data collection round						
	Min	Q1	Mdn	M	Q3	Max	SD
10	-7.75	-3.75	-1.75	-1.84	0.00	7.00	2.61
11	-7.75	-3.50	-1.75	-1.69	-0.25	8.25	2.78

Table 4.3 - Table of summary statistics relating to students' Relative Autonomy Indices from the second SRQ-A round for their respective Year Groups

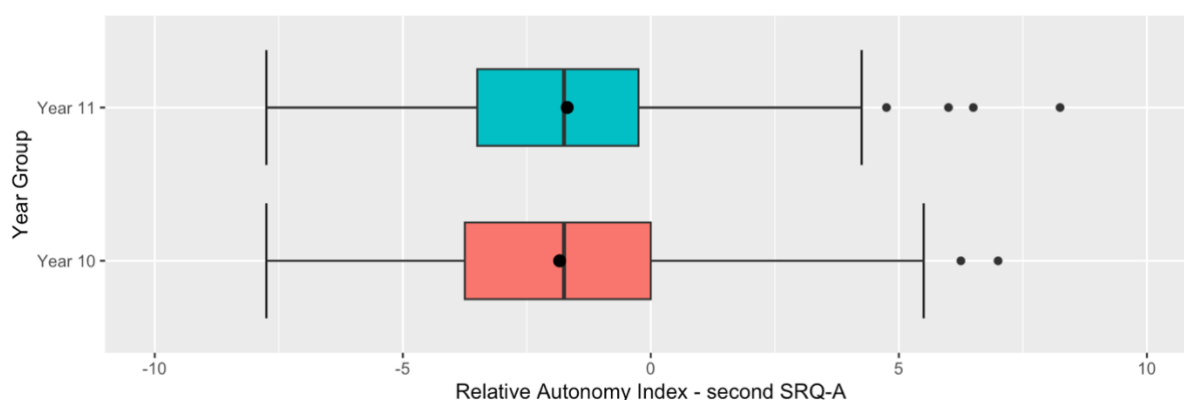


Figure 4.7 - Boxplot of summary statistics for Relative Autonomy Indices from the second SRQ-A round of data collection

These data and visualisations demonstrate the distribution of the RAI values for students in years 10 and 11 at the second SRQ-A during the year of the study. For year 11, students' RAI values similarly suggested controlled motivation to a slightly larger extent than autonomous motivation, given the median value of -1.75 , as with the first SRQ-A. For year 10 students, the summary statistics produced a similar picture as with year 11, although the interquartile range of students is slightly larger. Additionally, the year 10 boxplot, especially the portion inside the interquartile range, supports that the students felt notably less

autonomously motivated than they did earlier in the year. How these values compare with the first round of data collection will be considered in the next subsection.

Year group	Third SRQ-A data collection round						
	Min	Q1	Mdn	M	Q3	Max	SD
10	-8.25	-3.00	-1.25	-1.55	-0.25	7.50	2.29
11	-8.50	-3.75	-1.75	-1.81	0.00	6.75	3.12

Table 4.4 - Table of summary statistics relating to students' Relative Autonomy Indices from the third SRQ-A round for their respective Year Groups

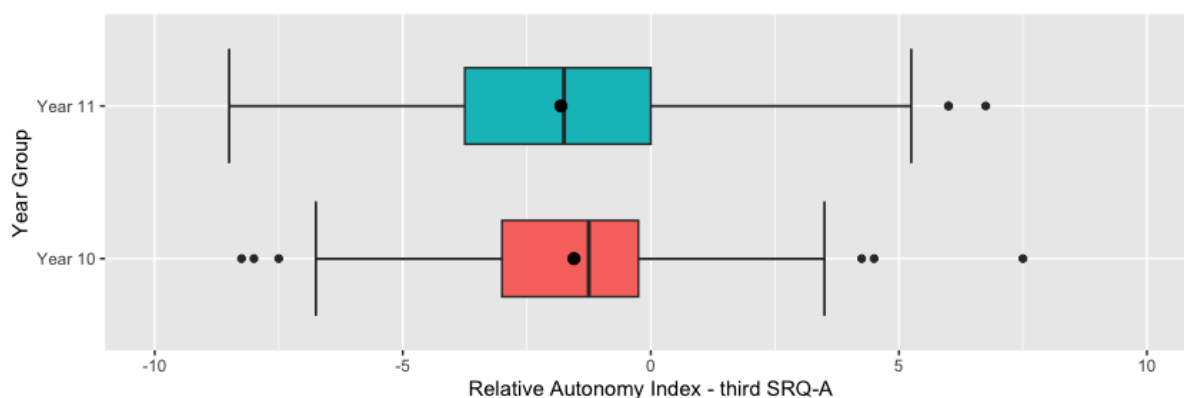


Figure 4.8 - Boxplot of summary statistics for Relative Autonomy Indices from the third SRQ-A round of data collection

Finally, these last boxplots and table demonstrate the distribution of the RAI values for students in Years 10 and 11 at the third SRQ-A. For year 11, students' RAI values suggested students primarily experienced controlled motivation given that only 25% of students' RAI values (i.e. above the third quartile) from this SRQ-A were above 0, despite the repeated median value of -1.75 , as with the first and second SRQ-As. The (arguably mild) increase in standard deviation supports the larger inter-quartile range, demonstrating a greater spread of results. The greater spread may indicate different students' responses to the pressure of the upcoming examinations (which were starting within two weeks for the year 11 students at the time of the last round of data collection), where some felt more autonomously motivated to work harder, whereas some felt more pressure from external sources to study. For the year 10 students, once again a similar pattern holds, though with a smaller interquartile range and a negative RAI value at the third quartile, the students demonstrated controlled motivation to a larger extent compared with year 11; removal of the single outlier at 7.5 would have reduced the mean RAI value further. Finally, again, the majority of students in year 10 also experienced primarily controlled motivation types given that over 75% of the students returned RAI values below 0.

4.3.2 RAI dependence on mean target grades

In addition to the linear regression discerning the dependence of TGAI on students' mean target grades, a single linear regression was also run to determine the dependence of mean RAI on mean target grades to determine the extent to which a student's autonomous motivation related to their expected outcomes, since these may correlate with their academic

ability. This test was conducted independently for each year group. For students in year 10, mean RAI was found not to be dependent on their mean target grades, returning $m = -0.102, p = .492$ where m is the gradient of the linear regression model. For students in year 11, $m = -0.042, p = .781$, again showing non-dependence of RAI on students' mean target grades. Both tests returning $p > 0.05$, along with gradient values so close to 0, suggests therefore that a student's autonomous motivation and their mean target grade are unrelated and independent of each other.

4.3.3 Change in RAI over time

Despite the p -value for the Shapiro-Wilk test (see subsection 4.1.2) indicating non-normality, the individual values for skew and excess kurtosis as well as W being close to 1.0 mean that the data for both year groups can be considered to be approximately normally distributed, so the statistical tests used with RAI values to can be considered valid.

When the t -test was conducted using the RAI values at the first and last points in the year for year 11, the values $t = 1.08, p = .142$ were returned, and the t -test for the RAI values for year 10 returned $t = 0.909, p = .183$ indicating a slightly smaller change compared to year 11. Since for both year groups $p > .05$, the null hypothesis fails to be rejected, so one can conclude that RAI did not meaningfully change through the year for either year group. When examining the results from the t -tests conducted using data within the year, the year 10 students did return a statistically significant reduction in RAI scores between the first and second data collection points, returning $t = 2.862, p = .00245^{**}$. The subsequent change in the opposite direction between the second and third points in the year were not found to be statistically significant (though can still be described as important), returning $t = -1.962$ and $p = .974$. This change in the opposite direction supports the lack of significant change across the entire year. However, the students in year 11 exhibited no (statistical or otherwise) significant change in RAI values through the year, returning $p > .05$ for both in-year t -tests.

4.3.4 Summary

For both year groups, throughout the year, students mostly returned negative mean RAI values, indicating a larger element of controlled motivation (as opposed to autonomous

motivation). In addition, for both year groups, despite the single statistically significant change early in the year for year 10 students, and subsequent non-statistically significant reversal, there were no overall statistically significant changes in the extent to which students were autonomously motivated through the year for either year group, by measure of their RAI scores. Additionally, RAI was found not to be statistically significantly dependent on students' mean target grades.

Whilst the RAI on its own does not directly contribute to any particular research question, this measure will help to support the discussion of students' motivation types (per research questions two and three), and allows for consideration of whether there is a relationship between the extent to which students are autonomously motivated (according to their RAI values) and the extent to which those students are motivated by the use of target grades; this relationship is considered in the next section of this chapter.

4.4 *TGAI relationships with other measures*

Following consideration of the measures relating the extent to which students are motivated by their target grades (TGAI) and their academic motivation (RAI), this section examines the extent to which the TGAI measure relates to other measures. Initially, the relationship between TGAI and students' mean target grades are outlined. Following this is the relationship between TGAI and RAI, and finally a multiple linear regression for TGAI and its (partial) dependence on RAI and mean target grade together. As mentioned earlier in this chapter, the statistical tests used can be considered robust to mild non-normal distribution. The distribution of TGAI values is considered close enough to normal, considering the large Shapiro-Wilk statistic (see subsection 4.1.2) due to the low values for skew, and low values for excess kurtosis.

4.4.1 Relationship between mean target grade and TGAI

Initially, the Spearman Rank Correlation Coefficient (SRCC) was calculated for the relationships between mean target grade (μ_T) and TGAI. The coefficient for the correlation between μ_T and TGAI for students in year 11 was $-.092$, indicating no correlation. For students in year 10, the coefficient for μ_T and TGAI was $.0076$, again indicating no correlation between the two values. Whilst the scatter plots below relate primarily to the linear regression models (the results for which are described following the plots), they also help to visualise the correlation values for each year group. For context, the GCSE grades available range from grade 9 (the highest grade) down to grade 1 (the lowest grade), and the target grades assigned to students ranged from grade 4 up to grade 9. This was because a grade 4 is largely seen as a 'pass' when considering entry requirements to future courses of study, apprenticeships, or other routes in further education nationwide. Additionally, grade 4 is described as a 'standard pass' by the Department of Education in England (Department for Education, 2019).

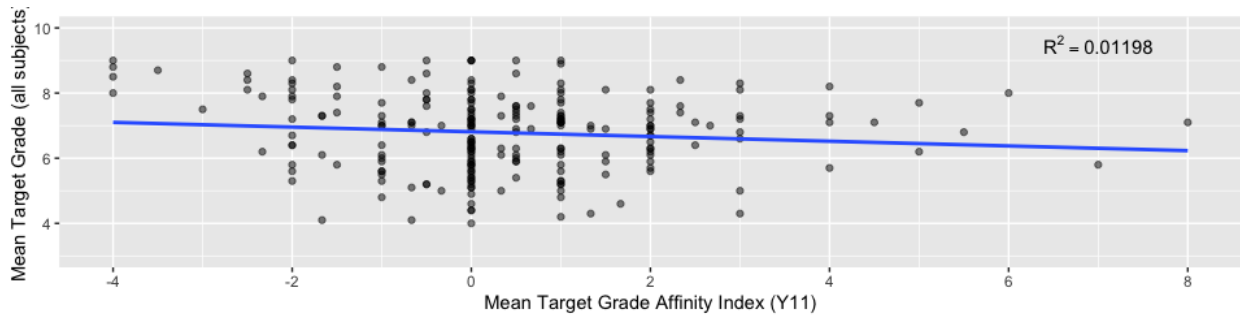


Figure 4.9 - Scatter plot showing the distribution of mean target grade across all subjects compared to the mean TGAi value for students in year 11

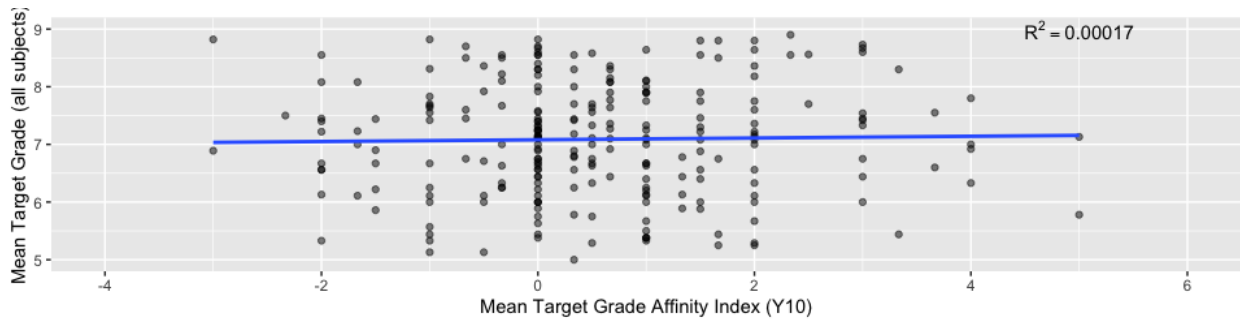


Figure 4.10 - Scatter plot showing the distribution of mean target grade across all subjects compared to the mean TGAi value for students in year 10

From the single linear regression model run on the relationship between year 11 students' mean target grades across all of their subjects, and their TGAi, the formula returned was

$$TGAi = 1.5124 - 0.1656 \times \mu_T$$

where μ_T represents the mean target grade, indicating a weak negative relationship (as supported by the Spearman Rank Correlation Coefficient above). This linear regression returned $p = 0.097$, which is higher than the significance level $\alpha = 0.05$ thus this result cannot be considered statistically significant, and therefore the null hypothesis fails to be rejected; that is to say that students' affinity towards target grade use is unaffected by their actual target grades. For students in Year 10, the linear regression model run between μ_T and TGAi returned the formula

$$TGAi = 0.65572 - 0.01886 \times \mu_T$$

which again supported the almost non-existent dependence of TGAi on μ_T . This linear regression returned $p = .840$, which is considerably higher than the significance level $\alpha = .05$ and therefore the null hypothesis also fails to be rejected here due to the non-statistically significant result, drawing the same conclusion as above. When considering the shape of each

graph, the spread on the TGAI axis (x-axis) also shows the smaller spread of TGAI values described earlier, and the darker points on each graph also indicate there were multiple points overlapping and therefore supports the density of TGAI values around value 0.

4.4.2 Relationship between RAI and TGAI

The linear regression model run using the year 11 students' RAI and TGAI values (considering the RAI as the independent variable, and the TGAI as the dependent variable) produced the formula

$$TGAI = 0.1163 \times RAI + 0.5516$$

indicating a very weakly predictive relationship between RAI and TGAI. This linear regression produced $p = .00529^{**}$, which is less than the significance level $\alpha = .05$, making this relationship statistically significant. Thus, the null hypothesis can be rejected, which is to say that the more autonomously motivated a student is, the higher their affinity towards target grade use. The y-intercept value (0.551) also supports the very mildly positive affinity for target grade use before considering the effect of the RAI on TGAI, given that the mean TGAI value for students in year 11 was consistently above 0.

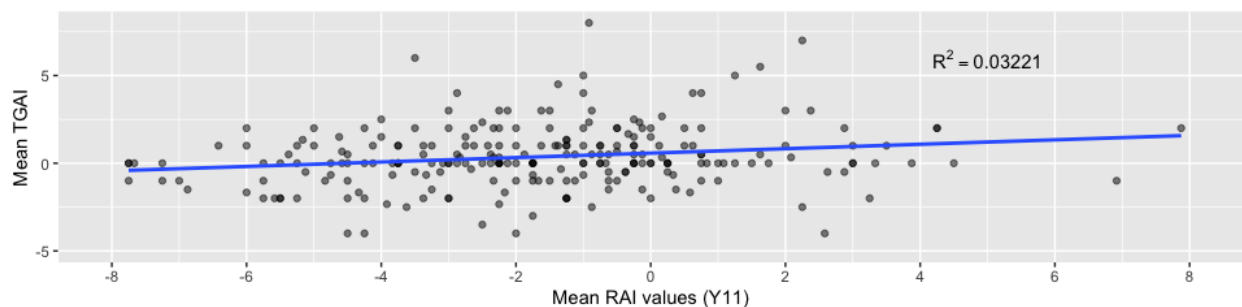


Figure 4.11 - Scatterplot showing the relationship between mean TGAI against mean RAI values for each year 11 student through the year

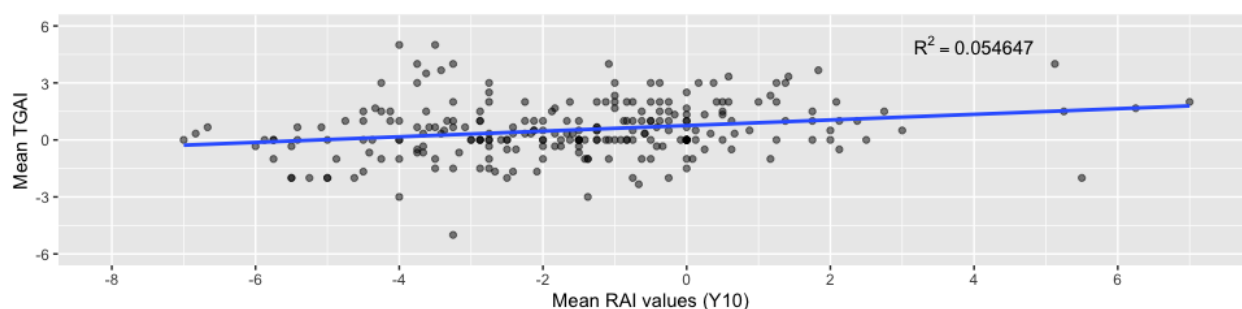


Figure 4.12 - Scatterplot showing the relationship between mean TGAI against mean RAI values for each year 10 student through the year

When a single linear regression of the TGAI and RAI values for year 10 was conducted, the formula produced this time was

$$TGAI = 0.1476 \times RAI + 0.7566$$

indicating that TGAI increases more depending on RAI with Year 10 students than with year 11 students. This linear regression model returned $p < .001^{***}$, which is below the threshold $\alpha = 0.05$ and therefore the null hypothesis here again can be rejected suggesting that for year 10 students, indicating that increased autonomous motivation predicts an increased affinity toward target grade use. Additionally, the y-intercept (0.756) being positive also supports the mildly positive position of students regarding the TGAI before consideration of the effect of the RAI, given that the mean TGAI value for students across year 10 was, like year 11, consistently above 0. The y-intercept being higher for year 10 also aligns with the higher TGAI means returned by students in year 10 throughout the year.

When the Spearman Rank Correlation Coefficient (SRCC) between the RAI and TGAI values for students in year 11 was calculated, .180 was returned indicating a weak positive correlation between the two measures. This weak positive correlation supports the positive and statistically significant weak dependence of TGAI on RAI from the linear regression described earlier. For year 10, the SRCC returned .256 showing a stronger, but still weak, positive correlation between RAI and TGAI, and again supported the statistically significant result from the linear regression and supports that RAI is weakly predictive of TGAI. Whilst both values are relatively close to 0, there is alignment between the weak correlation coefficient and significant but weak dependence from the linear regression, indicating that the correlation is important.

4.4.3 Multiple Linear Regression for TGAI, RAI and mean target grade

In addition to the linear regression model shown above, a multiple linear regression considering the effects of both mean target grade and RAI on students' TGAI simultaneously was conducted. The multiple linear regression model conducted for year 11 students produced the formula

$$TGAI = 1.653 + 0.1109 \times RAI - 0.1610 \times \mu_T$$

aligning with the weakly positive relationship between RAI and TGAI and weakly negative relationship between mean target grade (μ_T) and TGAI. The multiple linear regression model returned $p = .00942^{**}$, which is less than the significance level $\alpha = 0.05$, thus indicating a statistically significant relationship whereby at least one variable of RAI and μ_T is predictive of the TGAI. Since the relationship between TGAI and RAI was found to be statistically significant, and the relationship between TGAI and μ_T was not, one can infer that RAI is the predictive variable here. The p values returned per dependence (i.e. one for RAI and one for μ_T) showed that, like with year 11, the RAI dependence was significant, and the μ_T dependence was not.

For students in year 10, the multiple linear regression model produced the formula

$$TGAI = 0.7838 + 0.1475 \times RAI - 0.003849 \times \mu_T$$

and this again supports the weakly positive dependence of TGAI on RAI, and almost null dependence of TGAI on μ_T . This model returned $p = .00105^{**}$ overall, again indicating a statistically significant relationship. The p values returned per dependence (i.e. one for RAI and one for μ_T) showed that, like with year 11, the RAI dependence was significant, and the μ_T dependence was not. The individual p values returned per dependence, as for year 11, supported that RAI dependence was significant and the μ_T dependence was not.

4.4.4 Summary

Based on the Spearman's Rank Correlation Coefficients (SRCCs) calculated between the students' mean TGAI values and their mean target grades, the correlations for both year groups were found to be close enough to 0 that they demonstrate no correlation. The linear regression models showing very small gradients and not being statistically significant suggest that there is no dependence of TGAI on students' mean target grades. However, TGAI was shown to be weakly dependent on the RAI values. There was a larger, but still weak, correlation according to the SRCCs calculated between TGAI and RAI. When single linear regression models were calculated for these two variables, TGAI was confirmed to be weakly dependent on RAI, whereby the higher a student's RAI value, the higher their TGAI on average: for both year groups, the dependence was found to be statistically significant.

These results were supported by the multiple linear regression model examining the dependence of TGAI on both RAI and mean target grade, where the RAI dependence was again found to be statistically significant, and dependence on mean target grades was not. This was the case for both year groups. Since a student's target grade affinity is (partially) dependent on the extent to which they are autonomously motivated, it will be helpful to see the motivation types that students aligned with and so the findings related to students' motivation types will be considered in the next section.

4.5 Motivation Types

In this section, in line with the second and third research questions (found in the Literature Review), the motivation type that students were associated with is considered. Initially, the proportion of each cohort of respondents associated with each motivation type is shown. This is followed by consideration of how each cohort changed over the course of the year.

4.5.1 Measurements of Motivation Types

As described in chapter 3 Methods, the motivation type that each student most closely aligned with at each data collection point was calculated using the students' responses to the SRQ-A. The remaining students (i.e. those with ties between more than one motivation type) were distributed randomly between the motivation types they most aligned with using three different random seeds, and these were combined with the students who primarily aligned with a single motivation type. The majority of students at all three points in the year aligned with a single motivation type, making up 85%, 77% and 79% of students at each point in the year respectively. Where the mean number of students for each motivation type was not an integer, the value was rounded to an integer.

Data Collection Point 1	Motivation Type Distribution	
	Count (N=398)	%
Intrinsic	9	2.3
Identified	157	39.4
Introjected	75	18.8
External	113	28.3
Amotivated	45	11.2

Table 4.5 - Motivation type distribution at the first data collection point

At the first data collection point in the year, only 2.3% of students were associated with intrinsic motivation, representing the smallest group of students, followed by students that identified as primarily amotivated with only 11.2% of participating students. The modal motivation type was identified motivation, representing almost 40% of the student participants, whereby students recognised that the work they were completing would be helpful for their academic outcomes despite the motivation coming from an external source, thus accepting the external motivators as their own, in line with established definitions of identified motivation (such as deCharms, 1968; Gagné & Deci, 2005, for example). When

grouping the motivation types into ‘autonomous’, ‘controlled’ and ‘amotivated’, students primarily aligned with controlled motivation types (i.e. introjected and external motivation, representing 47.1% of the students). This occurred despite identified motivation (as an example of an autonomous form of motivation) being the modal individual motivation type. The higher proportion of students aligning with controlled motivation types corresponds to the negative (albeit close to 0) mean values for RAI, indicating a lower level of autonomous motivation.

Data Collection Point 2	Motivation Type Distribution	
	Count (N=237)	%
Intrinsic	5	2.1
Identified	79	33.4
Introjected	49	20.5
External	64	27.0
Amotivated	40	17.0

Table 4.6 - Motivation type distribution at the second data collection point

At the second data collection point in the year, only 2.1% of students aligned most closely with intrinsic motivation, and identified motivation again was the second-most represented motivation type with 33.4% of the students. In a similar way to the first data collection point, once again despite identified motivation being the most common motivation type, the combination of students experiencing controlled motivation types represented almost half of all of the student participants, with 47.5% of students aligning with controlled motivation types. Again, this aligned with the mildly negative mean values for RAI, again supporting that the students on average experienced slightly more controlled motivation, rather than autonomous motivation.

Data Collection Point 3	Motivation Type Distribution	
	Count (N=223)	%
Intrinsic	4	1.9
Identified	84	37.7
Introjected	52	23.5
External	50	22.4
Amotivated	32	14.5

Table 4.7 - Motivation type distribution at the third data collection point

Finally, at the third data collection point, once again intrinsic motivation represented the least common motivation type, representing only 1.9% of students who participated in the study at this point. Aligning with the first two rounds of data collection, identified motivation was once again the most common motivation type, representing 37.7% of

students, despite 45.9% of students aligning with controlled motivation types in total; this once again aligns with the mildly negative mean RAI values for each point in the year.

At all three points in the year, it is clear that students in general primarily experienced controlled motivation types. However, the proportion of students at each point that experienced autonomous motivation types (i.e. intrinsic or identified motivation) trailed with approximately 10% less of the participating students. The methods employed to motivate students by the school (and perhaps other schools too) therefore likely induced primarily controlled motivation types, though the notable proportion of students demonstrating autonomous motivation (primarily identified motivation) showed that there were students who recognised the importance of their academic work at school for their future and accepted the (external) motivators as their own.

4.5.2 Change in Motivation Type Over Time

As described in subsection 3.6.2, to identify the extent to which there was a statistically significant change in students' motivation types through and across the year, Stuart-Maxwell tests were conducted between each data collection point in the year and for across the whole year. A visualisation of the proportions of students associated with each motivation type at each point in the year can be seen in Figure 4.13 below.

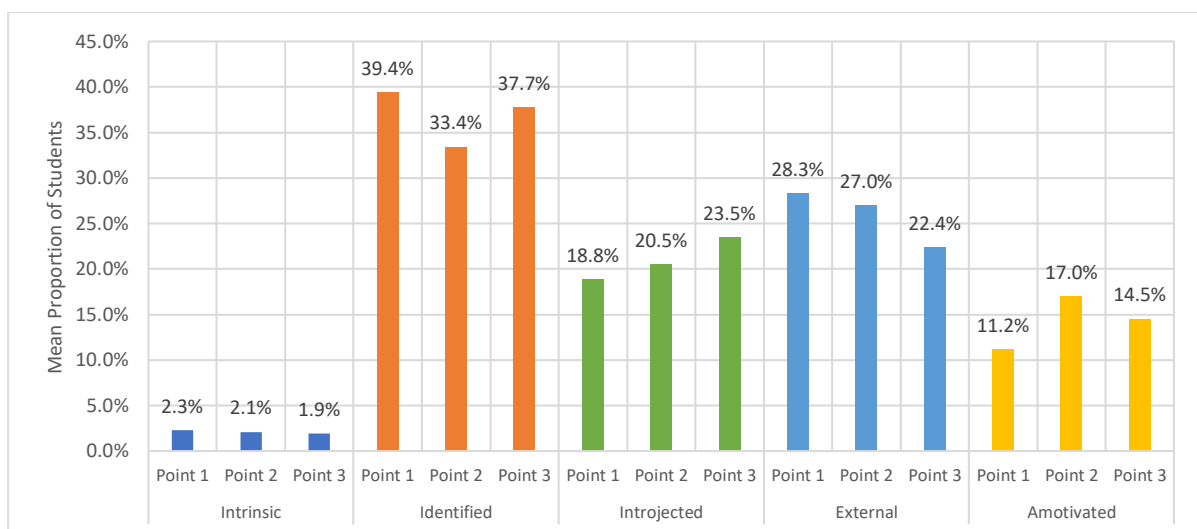


Figure 4.13 - Grouped bar chart showing the proportion of student aligning with each motivation type at each data collection point in the year

Firstly, it is notable that the proportion of students aligning with each motivation type remained approximately consistent through the year, as described in the previous subsection. However, there were a few changes through the year worth noting. The figure shows a mild decrease in the proportion of students aligning with identified motivation from the beginning to end of the year, and a more notable decrease in students experiencing external motivation across the same time. This was mitigated by an increase in students experiencing introjected motivation, and to a lesser extent, amotivation. These changes were quantified through the use of Stuart-Maxwell tests (Maxwell, 1970), as described in subsection 3.6.2.

Given that combining the results from the Stuart-Maxwell tests using each of the random seed distributions of students with motivation type ties, in the same way as calculating a mean proportion of students associated with each motivation type, is not feasible, the results from the Stuart-Maxwell tests using all three random seeds are shown in Table 4.8 below. It is important to note that these tests also included all the students that aligned with exactly one motivation type in the original calculation; the students aligning with a single motivation type made up the majority of each sample of participating students.

		set.seed(1)		set.seed(28)		set.seed(10)	
		χ^2	p	χ^2	p	χ^2	p
Point 1 to Point 2	Year 10	10.776	.029*	5.048	.282	7.967	.093
	Year 11	2.894	.576	2.103	.717	1.922	.750
Point 2 to Point 3	Year 10	13.256	.010*	9.864	.043*	9.126	.059
	Year 11	3.028	.553	1.752	.781	0.728	.948
Point 1 to Point 3	Year 10	0.543	.969	1.953	.745	1.100	.894
	Year 11	8.558	.073	5.523	.238	6.967	.138

Table 4.8 - Results from Stuart-Maxwell tests conducted per year group at each point in the year, for each random seed test for distributing students with ties

Three statistically significant (with $p < .05$) differences were found: each is indicated with an asterisk. The first of these was for students in year 10 between the first and second points in the year, though this only occurred in one of the three distributions of students with ties. Of the other two tests, the second suggests that one could be confident of no statistically significant change, and the same can be said of the third, though the p -value is still small. The statistically non-significant change in year 10 students' motivation types between the first and second points in the year using the other two random seeds may lead one to conclude that the changes that did occur can be overall described as non-significant, though perhaps still important.

The second and third statistically significant changes in the year were both found between the second and third points in the year, and both for students in year 10, with the third test for year 10 at this point yielding p close to, but still larger than, .05. One may be more likely to consider the change in year 10 students' motivation types to be statistically significant here given that two of the three p -tests returned a significant value. The visualisation shown in Figure 4.13 suggests that for some students, this change was in the opposite direction compared to the change between the first two points in the year. For example, see the changes in identified motivation and amotivation. When considering the change across the whole year (i.e. between points 1 to 3 of data collection), no statistically significant changes were found for the students in year 10, and the changes in proportions as shown by Figure 4.13 can largely be attributed to students in year 10. Given that the changes between points 1 and 2 and points 2 and 3 seem to be in opposite directions, and the lack of statistically significant changes across the whole year with $p > .74$ for all three random seed tests, one can surmise that there was no meaningful change in students' motivation types across the year for students in year 10. Further, no statistically significant changes in

motivation types were found for year 11 at any point, neither between specific points in the year nor across the whole year, and so the same conclusion vis-à-vis a lack of statistically significant change in motivation types, can be drawn for students in year 11.

Since the Stuart-Maxwell test works pairwise, i.e. depends on students taking part in the first and last round of data collection, a contingency table showing the initial and final motivation types of students is shown in the table below.

Initial motivation type	Final motivation type				
	Amotivation	External	Introjected	Identified	Intrinsic
Amotivation	20	1	2	3	1
External	9	24	16	12	1
Introjected	2	14	24	8	0
Identified	1	11	12	56	2
Intrinsic	0	0	0	3	1

Table 4.9 - Contingency table showing the initial and final motivation type for students that took part at both data collection points, N=223.

The table shows that most students associated with each motivation type initially were aligned with the same motivation type at the end, shown by the diagonal. Most students were associated with the same motivation type at the beginning and end. The table does show the number of students that changed motivation types too, though as shown by Table 4.8, with $p > .05$ for any change between the beginning and end of the year, these changes were not statistically significant.

4.5.3 Summary

The findings in this section highlight that the majority of students did not experience a tie between more than one motivation type when this was calculated for each student, making up over three quarters of students at each point in the year. Despite these ties, patterns were clear for the student participants in both year groups. Consistently, identified motivation was the most common, and intrinsic motivation was the least common. Contrastingly, in sum, more students aligned with controlled motivation types, compared to autonomous motivation types, representing almost half of the students at each point in the

year. At all three points in the year, the distributions of students' motivation types aligned with the mild negative RAI values, indicating mildly more controlled motivation. The visualisation of these distributions shown by Figure 4.13 demonstrate the prevalence of identified motivation, and the notable extent to which students experienced one of the two controlled motivation types. The figure also highlights a slight increase in amotivation and introjected motivation, and a decrease in the proportion of students experiencing identified, intrinsic and external motivation. Though there were no statistically significant changes found across the whole year, there was some fluctuation in motivation type distribution for students in year 10.

4.6 Conclusion

The target grade affinity index (TGAI) values calculated, while positive, were consistently close to 0 indicating ambivalence toward target grade use from students on average. This measure however does not account for the students with particularly high or low TGAI values, representing students that felt strongly academically motivated by, or academically demoralised by their target grades respectively. The lack of change in TGAI values over the course of the year as a whole show that findings held true and were consistent. A small in-year change for year 11 students and subsequent statistically non-significant reversal later in the year also supports the lack of change overall. Despite the weak dependence of TGAI on students' autonomous motivation according to their RAI values) neither of these measures depended on the students' mean target grades. Where students were more autonomously academically motivated, they were mildly more motivated by their target grades (and the converse argument is also true). That is to say that students' motivation resulting from their target grades did not depend on what the target grade's value was, but more so on the fact it was present.

The mildly negative RAI values indicated that, despite an overall approximate balance between students experiencing autonomous or controlled motivation, a slightly larger proportion of students identified more closely with controlled motivation types. Of those who experienced autonomous motivation, they were still primarily extrinsically motivated (through identified motivation), recognising the importance of their academic work for their future, including further academic study as well as potential careers (Howard et al., 2021). Despite the early change and then statistically non-significant change in the opposite direction of RAI values for students in year 10, there was no overall change across the wider year, and no changes were identified for students in year 11 at any point. These data aligned with the motivation type distribution for students across both year groups through the study year.

Although the vast majority of students aligned primarily with a single motivation type, there were likely elements of other motivation types present for all students, as implied by the small but important proportion of students who tied between more than one motivation type. During the data collection, students were asked to consider all subjects. While the findings here can be considered trustworthy given the relative consistency of distribution

between motivation types at each point in the year, as well as the alignment with other measures outlined in this chapter, it is possible that students may have been considering different subjects while responding to the SRQ-A, and that their motivation types could vary slightly depending on the subject they were thinking about at the time. The findings relating to motivation types can be considered trustworthy because the Chi Square values found for the different random distributions of students with tied motivation types showed that the distributions did not, overall, change in a meaningful way. This, combined with the similarity of the proportions of students aligned with each motivation type at each point in the year provides confidence in the findings.

5 Pupil Perspectives on Target Grade Use

This chapter details the qualitative findings from the four focus groups run with student participants in the study. Where appropriate, brief statements collected from the teacher interviews are also given where they add additional context to findings from the students' contributions.

Writing inside boxes such as this throughout this chapter provide my professional knowledge, and provide additional understanding to the reader with further explanation of the perspectives put forward by students (and occasionally the teachers). Comments inside this box do not compare the findings they follow to existing literature, since that is covered in the Discussion.

Box 5.1 - Explanation of chapter 5 context boxes

The data collected from the focus groups covered a range of topics, with a focus on the use (or lack thereof) of target grades by both teachers and students. Given that the focus groups were designed and conducted with self-determination theory (SDT) in mind, there are elements of this evidenced throughout the findings in this chapter, in addition to other potential theoretical explanations throughout.

Sections 5.1 and 5.2 outline the perspectives of students firstly regarding target grades specifically, and this is then followed by students' identification of alternative targets they had set themselves in lieu of target grades. Some students indicated that their target grades were helpful for providing a minimum benchmark that they wanted to attain by the end of their GCSEs. However, the majority of the comments provided by students indicated that they found setting their own targets based on a range of factors as more helpful than the target grades issued by the school.

There were a number of other themes that related to students' academic motivation. The first section of these (section 5.3) describes the students' perspectives on pressure and control, whereby the extent to which they experience extrinsic forms of motivation through pressure from their parents/guardians or their teachers, and in some cases from themselves. Additionally, students outlined some of their experiences relating to the elements of control they experience such as sanctions for homework incompleteness or for performing poorly in assessments.

During the focus groups, students also described ways in which they experienced collaboration and competition, and how these affected their academic motivation. The points made by students relating to ability-based grouping, working with peers, motivating (or being motivated by) peers, and competing with peers for higher scores on in-year assessments, are all detailed in section 5.4. Building on this section and the one before, students' perspectives and experiences of life beyond the classroom are detailed in section **Error! Reference source not found..** This section focuses on students' experiences of homework setting by teachers and their parents' or guardians' values on education and the effect this had on their own views of the importance of education.

Unsurprisingly, the students provided a range of perspectives and experiences during the focus groups. Section 5.6 describes the differences of experience that students discussed throughout the focus groups, and how their different experiences both in and outside the classroom had affected their motivation. Beyond just difference of experience, section 5.7 considers factors that students brought up that may hinder or support their academic success. This section focuses less so on academic motivation, though the factors described such as workload (via homework), students (in)ability to manage their own time effectively, and the Covid-19 pandemic, were likely to affect students' academic motivation (and to a lesser extent, academic outcomes).

The final two sections in this chapter (sections 5.8 and 5.9) show how students' perspectives changed through the year in relation to all of the themes described in the preceding sections of the chapter, and finally several other notable themes that were identified from the focus groups. These other themes included the extent to which students perceived themselves to be academically competent, their enjoyment of learning, and how their health may affect their academic motivation or outcomes. The chapter will end with a summary of the findings and a brief conclusion, to be followed by chapter 6 Discussion.

The findings outlined in this chapter will be triangulated with the quantitative findings in chapter 4, and related to the literature in chapter 2 following this chapter, in the Discussion.

5.1 *Students' perspectives on target grades*

During the focus groups, a wide range of perspectives on the use of target grades were provided by the students, beyond whether they approved of the practice or not. This section describes the students' perspectives on the use of target grades. There was evidence of students experiencing pressure from their teachers based on their target grades, ideas about whether the target grades were too high or too low for the students' own aspirations, and ways in which the target grades may have aided their motivation, even when the students did not explicitly state that their motivation had benefited.

All five participants in year 11 highlighted the link between a lack of autonomy and experiencing external pressure rooted in use of their target grades by others. For example, Wendy said "I feel like some teachers ... if you don't get near your target grade, they make you re-sit or stay after school" with a tone of frustration. If students know there is the prospect of extending their school day to complete additional lessons or assessments, they are necessarily experiencing pressure to perform to the academic standard required to achieve their own target grade. This offers almost an exclusively external motivator for students. Eight months later, Wendy then said she had been moved into a different PE class to focus more on the academic assessment preparation rather than practical activities, and explained that this was a result of missing her target grade in a practice assessment. During both year 11 focus groups, Kyle described a similar experience of attending additional sessions after school having missed his target grades. Despite describing a positive experience of after-school intervention in PE in advance of re-sitting assessments (indicating introjected motivation), Stan, Wendy and Eric all argued that the same experience in English had been more negative (indicating external motivation). They all had experienced being asked to re-sit mid-year assessments based on having missed their target grades, despite not having had guidance on how to improve on their prior performance; this is associated with external motivation and is unlikely to be helpful for students' perceptions of their competence. These experiences indicate an outcomes-focused culture at the school, though this contrasts with the experiences outlined in the section below (5.2) of this chapter whereby some teachers seem to want to more actively support students' *learning* and perhaps enjoyment of learning.

Intervention sessions taking place after school were less common for students in year 10, though not unheard of, but became more frequent as students entered Year 11. Some teachers may start optional 'drop-in' sessions early in the academic year, but there was a central timetable for each subject for students to start attending extra lessons during 'period 7' (an additional lesson period after the normal school end time) enacted from around February of the academic year. These would more likely be focused on revision. Most curricular departments would target these sessions to particular students, though some would be open to all students of that subject.

In terms of re-sitting assessments, there may well have been some teachers that did not provide additional guidance for re-sitting assessments. However, it is unlikely that the students did not receive *any* feedback at all in advance of these re-sits.

Box 5.2 - Compulsory intervention and re-sitting assessments

There were also a number of comments by students that seeing target grades that were lower than they might expect leading to feeling demoralised, again indicating examples of reduced perceptions of their own competence. This sentiment was argued by Lois suggesting that her targets were not as high as she expected. In the same focus group, Chris suggested that the target grades he had been issued limited his teachers' expectations of his ability, and Wendy said that the tasks her teachers in one subject set also suggested that they underestimated her ability, from her perspective. Eric said:

"You've also [seen] the numbers [target grades] kind of like a 5 or a 6, ... it seems quite low and when you get like 8 or 9 and that's really high and that's ... what the majority of us aim for as well. Not like seeing 5 or 6 'cause it, like it kind of brings us down in a way".

(Eric, Year 11 Focus Group 1)

Another example of students suggesting that target grades were too low was Peter pointing out that his target grades were also lower than expected. Peter grew up primarily in a non-English speaking country, and asked the question of whether speaking English as an additional language had led to reduced expectations of him too, or if he was expected to not close his 'language gap'. Finally, students in year 11 also described feeling that their target grades were too low. Eric said that in some subjects his target grades were grade 6s, which

he felt was lower than his ability would suggest. He asked, “what’s the point when they think I’m still going to get 6 at the end of like our test[s]?”, and described this as feeling “underrated” by his teachers. Here, Eric may be confusing his target grades, generated using prior attainment and edited by the school’s leadership, and his predicted grades, which *are* produced by his teachers based on their contextual knowledge of his work. Regardless, these experiences by students again provide examples of interactions with teachers based on their target grades that may damage their perceptions of their own competence, likely hurting their academic motivation in general.

Regarding Peter’s comments in the previous paragraph, in my years teaching year 11 students, I taught several students who had an English as an Additional Language marker, though they were usually fluent English-speakers. These students often had lower target grades, either because they had not sat the year 6 SATs exams, or because they had arrived in England shortly beforehand, and were not yet proficient English-speakers and scored poorly in those exams. Often, these students significantly outperformed their target grades.

Box 5.3 - Students with English as an additional language and their target grades

In both year 11 focus groups there were suggestions that their target grades were too high given their struggle to meet the target grades in assessments, and did not reflect their ability. For example, Kyle described receiving a grade four grades below his target grade, and felt he would not be able to make up that difference before his GCSE exams. Kyle and Wendy both said that some teachers would highlight if a student had missed their target grade but then did not explain how to improve their work to reach that grade, negatively affecting that student’s ability to reach that grade. While some students may have benefited from some level of relatedness with others in a similar position, this additional pressure was not likely to support students’ need for some degree of autonomy. Similarly, Stewie explained that he was pushed by his teachers to be aiming for grades 8-9, which he felt was too high, but he did not explain, and perhaps did not know, why the teachers chose those grades. This could have been related to the target grades he had been issued in those subjects. The ideas students presented relating to target grades being too high or too low suggest that they may be experiencing what they perceive to be unfairness, feeling that they were being held to a different standard from their peers. Alternatively, students may have struggled to accept their target grades (whether they were perceived as too high or too low) because there was a

disparity between the target grade and the student's perception of their own competence, creating the negative feelings described in this section.

In the year after the data had been collected, Stewie was assigned to one of the classes I taught, and showed evidence that even small increments in increased effort led to significantly more thorough and accurate responses to examination-style and low-stakes questions. Whilst the teachers he described may not have explained their insistence he should be aiming for the highest grades, it is likely that these were related both to his target grades *and* the academic potential Stewie was deemed to have by those teachers.

Box 5.4 - Teachers' knowledge of students and their aptitude

Further, in the same focus group as Stewie's comment above, Meg made the argument that she felt pressure to demonstrate a certain (undefined) level of competence by her teachers, but it was unclear what her teachers' expectations were based on. Several students indicated that their target grades felt unachievable, for example Heidi expressed that she felt she worked hard to reach her target grades but felt demoralised when she did not meet them in assessments, or Kyle suggesting that his target grades were demotivating since "if you know you're struggling to get a grade 6, you can't get a grade 8", implying that his target grade was a grade 8 in this scenario. Bonnie described thinking that her target grades being set at the highest available grade demoralised her too when she missed them. Later, Bonnie and Stewie agreed that this disparity between target grades and assessment grades led to the belief that a significant portion of students believed their target grades to be "unachievable" or too high. Similarly, Meg described feeling "a bit incompetent" in situations where she did not meet the target grades she had been set, or her own personally set target grades. Meg and Bonnie in particular suggested through these statements (among others) that they felt a need to conform to the expectations that the school, and potentially others, had of them, and that they had internalised others' values on the importance of education.

Peter described experiencing pressure to improve performance as motivating, and Brian explained that the use of target grades by his teachers to push him for improvement was encouraging, despite the necessary lack of autonomy. However, Stewie suggested that this pressure "takes away the curiosity and motivation" (Year 10 Focus Group 2), indicating that, unlike Meg and Bonnie, he did not feel the need to conform to others' expectations and

was happy to resist them, potentially setting his own expectations. Further, there is the possibility that this extends to Stewie feeling compelled to resist against the wider power structure between himself as an individual student and the school as a whole. Students in both year groups described a scenario in which their target grades seemed too high and therefore were demoralising. In year 10, Bonnie said that her target grades being as high as 9s meant that in some tests where she achieved grades 6 or 7, the target grade was not “actually reachable”. Peter had had a similar experience. In year 11, Eric and Kyle said they “hate” target grades. Kyle said

“I feel like if they’re [target grades] so high, like if you’re currently getting grade 5s and your target grade is a grade 9, oh I can’t make up four grades so what’s the point so then you sort of limit yourself in what you can do”

(Kyle, Year 11, Focus Group 1)

which helps to emphasise this point. Eric then agreed with this, and Stan continued by saying that while he wanted to push himself to meet the high targets, he didn’t feel as motivated as possible given that the target grades were so high.

There were a number of other perspectives provided by students relating to their experience of target grade use beyond whether they thought they were accurate to their ability. Stewie agreed that the data their target grades were based on was too old to be reasonably considered accurate.

Students were generally aware that their target grades were generated primarily using data from their Key Stage 2 (KS2) SATs data. The SATs exams are sat at the end of Year 6 (age 10-11), and then target grades were generated at the start of Year 10, just over three years later, and nearly two years before they sat their exams. It is true that this is a large amount of time to pass between KS2 SATs and final GCSE exams (five years), however there were (and are) no other public exams that have taken place where students could be consistently compared to the national cohort of students.

Box 5.5 - Students' awareness of target grades' origins

Peter supported Stewie in this, making the argument that target grades may be an inappropriate motivator given the time that lapsed between their generation and the final exams students sat since an array of personal issues could take place in that time, distracting

students from accurately demonstrating their competence. Further, Bonnie and Chris explained that teachers knew their students, and so their predictions of final grades (and therefore, demonstrations of competence) felt more valuable than target grades as motivators and this is described in further detail in the next section of this chapter. Additionally, students commented that the pressure they felt to build their competence was also more motivating, or felt it was more important, when compared to needing to meet their target grades. For example, Brian, Meg and Bonnie all indicated that they were more motivated by the idea of academic improvement. These views show pragmatism in the students, in an attempt to identify the best way to motivate themselves to achieve as highly as possible in their GCSEs, or what worked best for them. In this way, students seem to have aimed for the most efficient method of motivating themselves, rather than ideals around the purpose of education.

There were also examples of students using their autonomy, seeing target grade use in a positive way. Despite the arguments described above about whether target grades were too high or too low, Glenn did suggest that his target grades could be used as a minimum benchmark that he wanted to achieve or succeed by the end of the GCSE course. Using a similar argument, Chris describing his target grades as a minimum benchmark to meet highlighted that target grades did affect his motivation to work, indicating an affinity to conformity with regard to the school's expectations. Additionally, there was a series of comments where students implied that target grades did act as a motivating tool, even if indirectly through their teachers. Eric said that his target being too low encouraged him to work harder so that he could 'beat' his target, suggesting a resistance to conformity in a similar way to Stewie, seeing the use of his target grade as a challenge to meet. Kyle and Heidi described their teachers referring to their target grades to suggest they were capable of the improvement that they wanted to see in assessments through the year.

Students in both year groups also discussed the ways in which their teachers used target grades to 'push' them. For example, Stewie acknowledged (in conflict with his suggestion that his teachers did not use target grades) that one teacher had suggested he needed to work harder based on the disparity between current and target grades, which he described as "helpful, informative". Bonnie said she had had a similar experience, having been encouraged to push beyond the target grades if she felt able, and Meg explained that her

teachers' expectations of her had stemmed from her target grades. Further, Stan said that he felt motivated to reach his target grades, despite feeling that some were too high, and Eric said he felt motivated to try and "beat" his target grades. The year 11 students extended on this and said that teachers often encouraged improvement of grades in general, suggesting that this improvement was the main goal. These examples indicate one way in which students may have been encouraged to take encouraging views of their own competence. Despite the points in this paragraph however, students in both year groups stated that most teachers did not use the students' target grades.

It was likely true that many teachers did not use the students' target grades, but it is also possible that students were just *unaware* of how they were used. Both teachers Michael (February 2023) and Jim (March 2023) described in their interviews that they did not think most teachers used the target grades. However, Jim also described using his students' target grades to 'get to know' the ability of his students at the start of the year, before ignoring them progressively more as he became more familiar with his students. Pam (March 2023) and Creed (March 2023) (both teachers in unpromoted posts) supported this, suggesting that they themselves also did not use their students' target grades beyond the first month or so of the school year.

Box 5.6 - Teachers' use of target grades, and students' awareness of their use

For example, Stan named Business Studies as the only subject where he was aware of target grade use by the teacher, and Kyle said that only "one or two" teachers used them; Wendy then said she was only aware of their use in Geography and Maths. Similarly, Peter said he wasn't aware of his teachers using target grades, and Meg said that they were only used by one teacher, but that that teacher was more invested in helping their students to improve on grades generally regardless of whether they missed, matched or exceeded their target grades, perhaps encouraging the pragmatic view that students described earlier relating to ways to most efficiently motivate themselves. This contrasted the points made earlier in this section about students being obliged to re-sit assessments based on how close their 'current grades' were to their target grades. It is likely that these experiences differed according to the subject or teacher that students were describing.

There were further arguments that target grades may have been considered helpful for their motivation such as Cleveland explaining that the target grades that he had been

issued helped support the confidence that he had in himself, though this contradicts the point he made earlier in the year that he felt he had exceeded his target grades already. Students in both year groups also highlighted that they felt it a positive that teachers were using their target grades to hold them to higher standards and encourage them to achieve their best, likely supporting students' perceptions of their competence. The target grades also helped as a motivator; Chris said that he sometimes worked to avoid missing a certain grade more so than trying to achieve a certain grade, with an unconfirmed implication that the grade he wanted to avoid missing was the target grade, demonstrating introjected motivation. This idea was supported by the year 11 participants' discussions in both focus groups that they were introduced to compulsory intervention should they miss their target grade in an assessment by two grades or more, described at the beginning of this section. Meg also said, "I think when you feel expected to get good grades as well, you put pressure on yourself to study so you do get those good grades that people are expecting" (Year 10, Focus Group 2) in response to a focus group prompt about use of target grades. Whilst excessive pressure could arguably be a negative motivator, Chris argued earlier in the focus group that pressure was an effective motivator for him. Finally, Kyle said that while he felt his targets were high, they were reasonable, and that with enough work they were achievable.

An explanation for how target grades were generated was presented in the Introduction and is not repeated here, however it is important to note that both Michael (February 2023) and Jim (March 2023) described the target grades as 'aspirational'.

Box 5.7 - Target grades as aspiration

In summary, this section outlined the various perspectives that students across both year groups held in relation to the use or non-use of their target grades. Some students considered their target grades too high, and others too low, perhaps suggesting that on average the target grades are pitched approximately where they should be. Additionally, students described feeling additional pressure to achieve their target grades from some teachers through the use of compulsory after-school intervention, though other teachers were not known to use the students' target grades at all. There were a range of experiences and perspectives shared, though students had in common that target grades may associate most closely with controlled forms of motivation. Finally, students' responses to either the target grades they were issued or the ways that teachers used them showed a variety of

desire to meet the expectations of others, or to resist conforming to the benchmark provided by a target grade, which was commonly seen as arbitrary.

5.2 *Alternatives to target grades*

Further to the perspectives that students had on the use of target grades described in the previous section, there were several alternative motivators or benchmarks to aim for suggested by students across the four focus groups. These included the use of teachers' predicted grades of their students, improving on previous assessment grades, and the minimum requirements for entry onto courses of further study ('entry requirements'), among others. This section details the comments made by students about these alternatives to the use of target grades.

Rather than aiming to meet (or exceed) target grades, there was a popular view that students should simply aim to exceed their own previous 'current' grades (as defined in the introductory chapter). This was suggested by Wendy, Heidi and Eric (year 11), and also by Chris, Cleveland, Meg and Bonnie (year 10). The idea that students should simply strive for improvement was suggested to these students by their teachers, indicating a focus by these teachers on the process of learning and emphasising making progress (i.e. building competence) over outcomes in general. This idea contrasts the experience of some students' statements described in the above section relating to teachers who were more focused on *outcomes* rather than *progress*.

At multiple points, year 10 students described choosing grades to aim for themselves as part of their own aspirations for the future. In the first focus group, Cleveland, Lois and Joe all agreed that their prospects were the most important motivator for working hard at that point in their education. Potential consequences for underperforming that they mentioned included the lifestyle they wanted to lead when older, their earning potential, and missing entry requirements for Key Stage 5 (KS5) or universities. These examples show students with autonomy in choosing what to aim for, as well as some introjection through wanting to avoid missing their goal(s). Prospects were mentioned again later by Meg, Glenn and Stewie. For example, Stewie highlighted that exam results would be important to "get a good job" and "do well in life". These comments indicated students' desire to choose their own academic goals, and the grades that those goals required. Chris described feeling additionally motivated to work toward a target when "it's something you've chosen yourself", indicating his autonomy acted as a motivator. Further, Meg suggested she had chosen to ignore her target grades in favour of her own benchmarks (grades 8-9), and Stewie explained that since he

knew his own strengths and weaknesses that he was better placed to decide his own target grades. Both this paragraph and the last echo the pragmatic views that students indicated through the statements described in the above section of this chapter through identifying the goal that is best for themselves, or what would advantage the student most. To extend the pragmatism, this perspective also supports the arguments students made that ignoring the target grades they were issued is a helpful practice; this is most likely to be beneficial for students who find their target grades demoralising.

In both year groups, students referred to using entry requirements for further study as benchmarks to reach rather than the target grades that they had been assigned by the school, likely leading to some of the self-set targets described in the previous paragraph. In several cases, these were related to students' aspirations for the future. Whether the target grades they were issued influenced the future plans students believed accessible to them or the grades they decided to aim for themselves was unclear. For example, Chris said "you know when you are in school, you're trying the hardest and then you're making it easier for your future self to like start revising for a test" (Chris, Year 10 Focus Group 1). Eric, after the group was asked whether they felt motivated to study and why, said "and just ... that bigger picture as well like when you want to like achieve that degree or job that you want to get in the future." (Eric, Year 11 Focus Group 1). Giving a more specific example of his future prospects, Cleveland also described feeling that he was not as competent as he could be in using computers, but that since he thought computing would continue to play an ever-increasing role in the workplace, he felt compelled to work to improve his competence in this area, presumably such that he is not excluded from jobs that depend on this kind of skill later. He also explained that he did not choose to continue studying Computing since, despite recognising its potential importance, he did not enjoy the subject. These examples further demonstrate examples of autonomy from students to varying degrees. Where students acknowledged that meeting entry requirements was helpful for their own goals, they showed identified motivation. Conversely, where the potential embarrassment of missing entry requirements was key, students indicate more introjected motivation.

The knowledge so many students in these focus groups had that their academic work would have an impact on their prospects was promising, even if their teachers (and I) may not always have felt they acted on that knowledge. It seemed that students often struggled to understand that their work in *all* subjects may relate to their future. Michael (teacher interview, February 2023) discussed that he believed that as a high-performing school, there were many students who believed they would achieve good grades just by being enrolled at this school rather than another local school (indicating an element of academic entitlement), perhaps supporting why students may not always have worked as hard as they could have despite knowing their grades were important.

Box 5.8 - Aspiration provided for students

In addition to ignoring school-issued target grades, Kyle also stated that the target grade “should be whatever you want”, echoing quotes in previous sections about students having their own aspirations. In year 10, the same argument was made by Stewie, Peter and Meg. For example, Meg said that she was aiming for grades 8-9 in all subjects regardless of what her target grades were, and this comment along with her point described in section 5.1 above (about wanting to conform to the expectations of others) indicate that Meg sees achieving high grades as a part of her identity. Additionally, Stewie said, “having your goal is good, but I feel like it’s better if you just decide it for yourself”, and Peter agreed. This supports Kyle’s point, demonstrating an effort by the students to introduce more autonomy into their own education. In all cases, students had matched the target grades they had set themselves to their personal aspirations for the future, again indicating a pragmatic view.

There were other examples of students referring to their own self-set target grades too. For example, Chris said he had his own target grades to aim for in each subject, and then Cleveland, Lois and Joe referred to their prospects as their main reason to build competence in any given subject. In some cases, it was unclear whether the targets they set themselves were based on entry requirements to future courses or something else. Bonnie suggested that she wanted to achieve certain grades to “get into the right university”, Stewie said he wanted “good grades” and Meg said she had her own aspirations that were higher than the calculated target grades. Glenn described target grades as a “minimum” to aim for, but that these were not (and likely lower than) the grades he wanted to reach. Earlier in the year however, students ranked ‘competence’ as one of the least important factors for their

motivation, despite the statements given by these students throughout that focus group indicated that a feeling of competence did positively influence their academic motivation. These points not only demonstrate the pragmatism described several times throughout this chapter so far, but also again the attempt to introduce more autonomy for themselves as well as now efforts to support their perceptions of their own competence.

All the students who took part in a focus group indicated some lack of approval of target grades. For example, Eric suggested that attainment depends on the work that a student put into a task rather than the target they aim for. He then later said “most people are just focused on the stuff they need to get into Sixth Form”, referring to the entry requirements needed to study a particular course. Additionally, Chris said he had chosen to aim for grades 6-7 in most subjects, since this would ensure he achieved the grades to continue at the KS5 portion of the study school, and these comments were echoed by Brian and Lois elsewhere in that focus group, again supporting efforts to introduce their own autonomy and pragmatic view of their futures.

The school where the study took place is a split-site school, with Years 12-13 (Key Stage 5 (KS5)) being based about one mile from the ‘main site’. Previously referred to as ‘the Sixth Form’, the KS5 provision consisted primarily of A-level courses, and there were entry requirements to be admitted on to each course. To be admitted to KS5, students were told they needed to achieve at least five grade 5s including Mathematics and at least one of English Literature or English Language. Specific courses included additional requirements on top of these. It might be helpful to note that KS5 providers with fewer restrictions were available in the local area too, and students were usually not excluded if they narrowly missed the *general* entry requirements.

Box 5.9 - Entry requirements for continued education at the separate-site KS5 at the study school

Glenn put forward a different argument, saying not only that he ignored his target grades, but that the ‘predicted grades’ (as defined in the introductory chapter) were more helpful. His justification was that they gave an indication of what grade the student could finish the course with, based on the teacher’s knowledge of a student, and that the data the teacher based their prediction on would have been far more recent than the ‘old’ data used to generate the target grade in the first place. Glenn said that he thought target grades were unhelpful since he had exceeded all of them half-way through year 10, and Peter said “they

are better to be ignored” because he was concerned that external factors may influence the final grade a student achieved and implied that comparison to their targets may be unproductive, again indicating a pragmatic perspective on his attainment. It is also worth noting that for the year 10 students, the difference between target grades and predicted grades needed to be explained when the two terms were both brought up, as with the teacher interview with Kevin, so the extent to which students were cognisant of the difference could be questionable, even if the explanation provided primarily a reminder of the difference.

When parents received a progress report about their child’s progress at each of the three points in the academic year, the target grades a student had been issued were shown next to predicted grades. The predictions were decided by the teacher of the specific student in that subject. There was seldom central guidance issued for deciding what a predicted grade could be; this was usually left to Heads of Department to cover with their departments (if they wanted to). The boxes containing the predicted grades were then colour-coded depending on whether it met or exceeded the target grade, was one grade below the target grade, or two-or-more grades below the target grade. Since these progress reports usually were shortly after assessment points in the year, teachers almost certainly used the assessment grades to inform their predictions.

Box 5.10 - Context for target vs predicted grades on student progress reports

The arguments put forward by students detailed in this section demonstrated the various benchmarks students use as motivators over the use of target grades. These included focusing on improvement on prior current grades, meeting or exceeding predicted grades based on their teachers’ knowledge of their work, or attempting to meet or exceed the entry requirements based on their individual future aspirations. In all of these cases, students demonstrated pragmatism through consideration of what benefits them the most. In addition, in the case of students focusing on improvement, this demonstrates a recognition that building their own competence in a given subject supports more positive outcomes, and supports increased autonomous motivation in that subject, even if the increased autonomy may represent identified or introjected forms of motivation rather than intrinsic. Finally, these alternative benchmarks represent a way in which students may have been attempting to introduce elements of autonomy into their work.

5.3 Lack of autonomy through pressure and control

Building on the various ways in which teachers use, or do not use, target grades with their students, there were comments in all four focus groups about the pressure that students' experienced from their interactions with others. These comments included discussing pressure from teachers, pressure from parents, and self-pressure as a result of their own expectations of themselves. Some of this pressure may have stemmed from target grade use, while some did not. There were also a number of comments made by students indicating that others had elements of control over their studying. These themes are described in this section, and these themes provide additional reasoning as to why the students may have been identifying ways to introduce autonomy for themselves in their education (as described in the previous sections), given the lack of autonomy demonstrated by the students here.

Two year 10 students described experiencing “overwhelming” pressure to succeed from their teachers. Cleveland explained that teachers “fearmonger” saying “if you don’t try so well, then you won’t do well” and Brian described trying to find a working balance to avoid “panicking”. During his interview, Jim (Teacher Interview, March 2023) described being “steered” by the target grades of his students at the start of the year, which may help to explain where some of the pressure described by Cleveland and Brian came from, despite Michael (Teacher Interview, February 2023) describing teachers using target grades differently from each other. For example, it seemed as though some teachers ignored the target grades entirely, whereas some used them as described by Jim, and some teachers used them to hold students to a given standard, for example through the intervention methods described by students in the first section (5.1) of this chapter. Finally, Meg explained that the pressure she experienced from herself and others (including references to both teachers and her parents) affected her mental health negatively, and that she struggled to handle this pressure.

As one would hope to see in any school, and especially one where pressure on students can be high, there was a member of staff whose full-time job was dedicated to looking after students' mental health and providing counselling services and coordinating with other services where required, separately from the traditional safeguarding team. This remains true at the time of writing. Meg was already in contact with this member of staff at the time of the focus group.

Box 5.11 - Mental health support for students at the study school

Students in both year groups highlighted their experience of expectation to study. These expectations primarily came from teachers but also parents to a lesser extent, and in all cases, it was unclear whether these expectations came, in part, from the target grades the students had been issued. Chris and Cleveland described experiencing teachers having expectation for extra-curricular work, for example Chris said, "teachers obviously expect you to be doing a certain amount of studying" and that he felt that by doing the additional work one teacher expected, another would be let down, indicating an element of perceived injustice. Later in the year, Peter said that his teachers expected him to complete additional work since he "cannot learn everything at school", and this experience of expectation was echoed by Bonnie and Meg too. In year 11, Kyle and Wendy also said they felt their teachers expected them to complete additional work also. This was supported by Wendy, Heidi and Eric describing the compulsory intervention they attended due to missing their target grades. While these comments demonstrate relatedness of experience, there is also a lack of autonomy for these students related to how to organise their own time, nor whether they want to complete the additional work or not. Further, these experiences provide examples of students' introjected motivation, through feeling they need to meet the expectations of others.

Brian argued that students would not complete any work outside the classroom had they not been told to by their teachers, but that this work was necessary for later academic success (indicating elements of both external and identified motivations), and Heidi made the same point, supporting a further lack of autonomy here, as well as a pragmatic focus on their own academic outcomes. Additionally, Lois, Cleveland and Joe supported this by stating that being directed with specific tasks to complete was helpful since students may not know what tasks they could complete instead; the motivation came from an extrinsic source, but the internalisation of this motivation could be described as identified motivation. Elsewhere in

the same focus group, Brian suggested that deadlines for work to complete also provided an additional (controlled) motivation for completing work. Despite this, Glenn and Peter expressed an enjoyment of learning, but suggested they experienced frustration with the lack of autonomy in choosing how to engage in the subjects they enjoyed outside the classroom.

Kenny said:

"I feel like a lot of people in our year [group] revise because [they're] expected to, yeah ... and then some people take in different ways some people expect them to do it, or some people want to do it for the future..."

(Kenny, Year 11 Focus Group 1)

Whilst there is an acknowledgement here of what was mentioned above regarding extrinsic expectation, Kenny also highlighted that some students he had associated with experienced autonomous motivation at least to some extent. This was echoed by Cleveland, Brian, Lois and Joe, suggesting that their individual aspirations meant they felt motivated to complete their academic work, indicating identified motivation (since they were largely still not choosing their own tasks to complete), acknowledging that building competence would be important for their examination success.

Cleveland described the pressure that his teachers applied, perhaps originating from his target grades, as "overwhelming". There were also a series of comments made by students that were associated with extrinsic forms of motivation. Firstly, Chris described working to avoid missing a certain (undefined) grade more so than trying to achieve another certain grade, however, it was unclear whether his target grades played a role in this. Later in the year, Meg said "I think when you feel expected to get good grades as well, you put pressure on yourself to study so you do get those good grades that people are expecting" (Year 10 Focus Group 2) and this led on to describing the pressure she puts on herself for a fear of not meeting others' expectations, demonstrating introjected motivation, and supporting the idea presented earlier that Meg may see her previous strong academic performance as a part of her identity, and therefore was important to maintain this performance. Contrasting the negative perspectives described here about the pressure that students experienced, Peter described the pressure applied to him, likely by teachers, but perhaps also by his parents, as "a good way of motivating yourself" (Year 10 Focus Group 2). He also explained that not being able to learn everything at school emphasised his acknowledgment that working outside the

classroom was important for his goals. Glenn also indicated experiencing the same type of motivation, saying:

“Sometimes I’m just a bit reluctant to do work because I feel like it’s like a lot of effort to do it ... at the end of the day, I feel like it helps me, so I just do still go on and study.”

(Glenn, Year 10 Focus Group 1)

Further, Eric described being encouraged (but not forced) to complete academic work at home too. In a similar way to Glenn, Eric was able to see the importance of completing teacher-set work for competence building and for academic achievement later, indicating identified motivation. Extending beyond Glenn’s perspective, Eric also suggests that he values education to a greater extent. Contrastingly to other students’ statements, Eric indicated greater autonomy and less pressure from his parents, saying:

“[be]cause like for me, my parents recommended it [revision] to me. They don't like force me to do it because like they just told me, it will also benefit you in the future as well, for GCSEs especially. But it's not like a thing where I'm forced to do it. I I sometimes I can choose what I want to do it as well. So most days I'm busy, but then after I try to like maybe 30 minutes from one subject, 30 minutes from another subject”.

(Eric, Year 11 Focus Group 1)

This section outlined the various ways in which students experienced a lack of autonomy in their academic work inside and outside the classroom through pressure and control exerted by those in positions of authority including parents and teachers, as well as pressure students apply to themselves. In some cases, students were unclear about where the (external) pressures come from, though in the case of teachers they may have been related to the target grades that the students were issued. There were a variety of student responses to this pressure, with some students describing it as supportive of their motivation, with others using negative language to describe their experiences.

5.4 Relatedness through collaboration and competition

In addition to the experiences students outlined with respect to their interactions with others and the sense of pressure some students experienced in response, there were also a number of interactions *between* students described. In each focus group, students described

experiences of both collaboration with their peers and working together to solve problems, as well as competition with their peers as a motivator to achieve higher grades, showing experiences of relatedness. These themes are both covered in this section. The comments relating to collaboration highlight the importance of who a student surrounds themselves with for their academic motivation and attainment.

One comment describing an example of peer-to-peer collaboration was Bonnie explaining that her choice of “smart” friends meant that she was exposed to people who chose to spend some of their free time completing additional revision for a subject, highlighting the overlap between Bonnie’s academic autonomy and relatedness experienced with her peers. Bonnie expressed disappointment that she had herself not spent any time completing additional work, but this experience of relatedness may have encouraged her to complete more work in the future. Stewie also described seeing his peers “studying all the time” which he felt added pressure to do the same thing. Additionally, when discussing setting, Kyle said

“I think we have sets [referring to classes of students sorted by ability per subject] though, but I [don’t] think there should be that big of a gap between the lowest and the highest student. I know maybe not for like options like business not like maths and science, they’re both done in sets. I don’t think there should be that big of a... I think they should just put them all together by their grades. So, I think they all have the same potential, so I think they should maybe differ for higher and lower grades, but there’s, we have sets for a reason so they’re all similar.”

(Kyle, Year 11 Focus Group 2)

Though not explicitly stated by Kyle, his argument in favour of ability groupings indicates that there may be opportunities for increased collaboration amongst peers in the same group in an effort to experience increased relatedness; he may perceive collaboration as easier if students with “the same potential” are grouped together. Finally, Heidi also made the argument for surrounding herself with peers that had a more positive attitude towards their academic work:

“...if I see everyone’s like, proper understanding this and revising it, and they’re like my friends, like revising, they’ll kind of make me want to revise because I feel if you’re

in a group that, like, hanging around with a group that does care, then they'll kind of make you follow them".

(Heidi, Year 11 Focus Group 2)

Heidi went on to suggest that being surrounded by peers who did *not* want to work hard meant that at times she did “not take it seriously”. Kyle referenced working with students who are ‘higher ability’ as motivating because this created social pressure to “push yourself to keep up with them”, which three of four peers agreed with in that focus group. Finally, Heidi (independently of the quote above) described feeling motivated to work hard in part from wanting to “fit in” or keep up with her peers. The existence of these social influences, whether in the form of pressure or encouragement, conflict with the indications from students described in previous sections that they were attempting to introduce their own autonomy, or to act on their pragmatism. Instead, students seem more likely to conform not to the expectations of those in positions of power (i.e. teachers or parents), but rather to these social pressures. In both examples of experienced pressure, these provided examples of introjected motivation as a result of social pressure and the associated (lack of) relatedness.

There was very much a social pressure to ‘keep up’ with peers in the classroom. After I would hand out marked assessments, some students would be keen to announce their results to their classmates (often accompanied with checking whether their marks had exceeded those of their friends), whereas there were usually at least a few students that would hide the front of their paper from the view of others for fear of being embarrassed.

Box 5.12 - Social pressure and competition in the classroom

There were however suggestions that competition may be motivational for pupils just as collaboration can be. Peter referred to the competition that often ensued following assessments, where students were likely to compare their scores and wanted to avoid having the lowest scores in their social groups. It was suggested during this focus group that pressure and competition had a larger motivational effect than target grades. This link to competition appeared in the first year 10 focus group too, where Chris also aimed to attain grades to exceed the scores of his peers and to avoid difficult conversations with parents. These points support the notion that students usually felt the need to demonstrate their competence for

the benefit of others, rather than building competence for the sake of their future academic outcomes.

When discussing setting, Eric indicated an element of wanting to satisfy his ego when he described wanting to move 'up' sets, and referred to the idea that different sets learned different things in some subjects, indicating a desire to be able to change the peers he surrounded himself with. When setting was discussed, Cleveland explained that he agreed with the idea of setting students by ability since it would be helpful for his academic performance, and Eric (in year 11) indicated that working with peers was helpful too since it introduced an element of "fun" to tasks they may not otherwise have any enjoyment of. Most of the students in year 11 also described experiencing competition as helpful for providing motivation to work, since they had a desire to "beat" their peers in terms of grades, and this would necessarily have been more competitive in ability-based groups since the students were more likely to get similar grades. In year 10, Chris, Lois, Brian and Joe also made the same argument, though focused more on the desire to keep up with their peers academically. The idea put forward that surrounding oneself with 'smarter' peers, whether that is through choice of friend, or by moving between sets, shows that the students are aware of the social influence their peers can have, and the potential positive and negative consequences on their academic motivation and outcomes. This could be seen as an alternative manifestation of the pragmatic perspective students held described earlier in this chapter, whereby students are utilising the collaborative and competitive nature of their social interactions inside and outside the classroom as instruments to support or improve their academic motivations.

At the beginning of years 10 and 11 respectively, students are sorted into ability-based groups for each subject (with the exception of optional subjects that students chose to continue studying, and Religious Education, for which they are mixed). Eric expressed desire to move up a set in Mathematics since he believed that he would be exposed to more complicated material in the subject and therefore would be able to achieve a higher grade in his final exams. This was contextualised further by Wendy saying she received work that suggested she should be aiming for a grade 7 and not to worry about learning the most complicated material, and by Michael saying in his teacher interview that the Mathematics Department set their own subject-based target grades for pupils. Students were usually aware of which set they were in,

though the school was starting to make it more difficult for students to work this out in an effort to reduce negative interactions between students relating to the sets those students were sorted into (i.e. bullying). In reality, while the experience described by Eric may have been accurate, each subject is expected to cover the entire curriculum with all students and any variation here is likely to focus on methods of challenge or support, or simply just the order the curriculum is taught in.

Box 5.13 - Setting at the study school and how subject departments used target grades

Some of the students in each focus group indicated that competition with their peers as well as working with their peers on tasks outside the classroom aided their competence in each subject. By deliberately experiencing the work together, they were increasing their sense of relatedness which in turn led to an increased sense of motivation.

Despite the arguments that some students made about being in competition with their peers adding to their motivation to improve their attainment, Wendy suggested that she found the inverse to be true. She said

"I don't really... I don't know because when if I try to like compare my skills to like my [twin] sister or something like try and get um, let's say that she she got much higher scores and then I try and revise to get closer to her, but I just don't think I would do that, you know? I don't really like compare mine with other people. I don't really care what they think about it. It wouldn't make me like wanna revise more really."

(Wendy, Year 11 Focus Group 1)

This comment may support the argument made elsewhere (see section 5.2) that improvement of one's own assessment grades is more important, although the perspective put forward by Wendy here is unusual, and more likely is associated with her overall amotivation, since she was the student randomly selected with this motivation type. Some of the comments Wendy made elsewhere in the focus group also highlighted that she believed that she and her sister had strengths in different academic subjects. It is possible therefore that she exhibited such indifference to being outperformed by peers since she felt her strengths lay in a different academic subject, or outside school entirely.

The experiences of students shared in this section show the ways in which they experience various types of motivation (and in some cases, pressure) through their

collaboration or competition with their peers. Students identified that collaboration with peers was important for their own accountability and supporting each other's academic progress. Additionally, some students explained that through being in competition with each other, there was additional extrinsic motivation to attempt to perform as well as possible. Unsurprisingly, students responded with varying degrees of positivity toward competition, with some students focusing on their own work, but with more students suggesting affinity toward some form of collaboration, supporting their need for relatedness to support motivation.

5.5 *Reduced autonomy beyond the classroom*

Several statements by students addressed the issue of homework and how they spent their time outside the classroom. The comments focused on the unpredictability of homework setting by some teachers and the difficulty this created for their own time management, and how able the students were to engage in extra-curricular activities, their autonomy as it related to revision activities and their mental or physical health. This section describes how these factors affected students' motivation and ability to be effective learners in the classroom.

While discussing issues around homework-setting by teachers, several students expressed again that the unpredictability of not knowing when homework may be set nor how long it would take, students described a distinct lack of autonomy over their own time-management. One of two students who regularly engaged in extra-curricular sport said

"[I would] come home, and all the homework would be cramped [crammed into a short period of time] and I, I would go to my sports, come back, and then I would only actually have ... you would have no time for yourself"

(Heidi, Year 11 Focus Group 1)

This sentiment was repeated in both year 11 focus groups, particularly by Eric and Kyle in relation to sport, and Stan in relation to music. Stewie explained that the time he spent playing sport meant that he chose to prioritise that over completing homework, which he tended to leave until the morning it was due, meaning he rushed the work. However, it was not clear from this explanation whether he would choose to spend more time on the work if he had more free time. In a similar way to statements in previous sections of this chapter, this may be one way in which students were trying to introduce autonomy into their academics, though it is also possible that Stewie's primarily controlled motivation means he was simply trying to avoid sanctions.

There was consistently a push from the pastoral team to engage students in extra-curricular activities each year, with this becoming a more central priority later. This included rebranding extra-curricular activities as 'co-curricular activities' such that the importance that they run alongside the academic curriculum be emphasised. There were also pushes on maintaining a high volume of homework setting for students as they got older too. Whilst some students managed extra-curricular activities and high homework loads well, the responses made by students in these focus groups indicated that sometimes it was difficult to manage and added stress.

Box 5.14 - Emphasis on extra-curricular for a well-rounded education, versus workload and time pressure

On the theme of how students spent their time outside the classroom, Cleveland suggested that in a subject he found interesting he was likely to think about it more, or choose to engage in the subject outside of school, indicating an element of intrinsic motivation. He gave the example of watching a historical documentary on a topic he found interesting, but he “wouldn’t go and watch something on maths”, and described that he would not have “take[n] anything from it” (Cleveland, Year 10 Focus Group 1).

There were also comments students made about the expectations they experienced to complete homework without relating to extracurricular activities and a lack of time, for example when Stewie said, “other people want me to [study] more than I do”. These examples indicate at least external motivation of the students to complete the homework or revision tasks set by teachers, in no small part since it was suggested further that homework completion depended primarily on avoiding sanctions. This was partially supported by Cleveland, Lois and Brian all agreeing that just over half of students generally study due to others’ expectations of them, demonstrating introjected motivation, and was described in further detail in section 5.3. This provides evidence of relatedness in terms of similarity of experience, as well as a lack of autonomy through pressure from others.

Peter spoke extensively about the lack of choice in revision activities that he was allowed to complete. Students had explained that some teachers would set specific tasks for students to complete to form part of their homework or revision, whereas some would leave the student more choice and insist only on seeing evidence of some revision the student had completed in any format. His justification for this was that allowing more autonomy in deciding what type of work to complete, or whether to complete any work at all, where

evidence of homework or revision would be through test scores, was related to preparing for life beyond school. Peter further gave the example of a student at university being expected to complete their own work without (much) guidance, or an employee may be expected to complete their work independently. Peter did however acknowledge that being asked for evidence of some work, whether it is chosen by the student or the teacher “does give you more motivation”, even if that motivation is of an extrinsic and controlled nature. Stewie then said that he tends to prefer methods of revision that do not stereotypically produce evidence of work, for example reading. There is of course debate around the extent to which reading textbooks (or something similar) could be effective for the purpose of remembering key knowledge or ability to answer examination questions in the way a marking scheme requires, even if such reading aids *understanding*. The contradictory points made by students here show that some autonomy is helpful since students may have felt they knew best what they wanted to improve, though other students’ arguments that being given specific tasks, despite the loss of some autonomy, reduced cognitive load through deciding what to work on was perhaps a more efficient way to build their competence outside the classroom thereby accepting the autonomy reduction.

Finally, several students agreed with Cleveland when he said that the “pressure in class to be alert all the time... obviously it’s useful but it’s hard sometimes if you’re tired from doing homework and stuff like that”. Despite not being explicitly stated, there is an implication here that the students may want to work harder during lessons but struggle to maintain their concentration all day, likely due to the intensity of the school day and the volume of homework they were sometimes set. This may also be compounded with the issues in the first paragraph of this section relating to issues around time-management.

In sum, the arguments made by students in this section echo the arguments made earlier about experiencing pressure and a lack of autonomy, though some students indicated agreement with the lack of autonomy in the case of revision activity choice since this could reduce their cognitive load. The loss of autonomy was described as less positively by students when it came to their time management however, with students expressing frustration on this front. It may be interesting that students did not argue against homework as a whole, but only its impact on their ability to plan their time. One could conclude here that in both of

these scenarios, increased student autonomy would support their academic motivation, even if teachers were to provide *options* for tasks, rather than a fixed single task.

5.6 *Reduced relatedness through difference of experience*

This section describes the extent to which students commented on their experiences and perspectives where they were not necessarily shared by their peers. These differences of experience related to workload, autonomy around revision tasks or homework, the way their teachers pushed them academically, and socioeconomic background, amongst other factors.

Joe, in describing his effort to improve at school and perceived recognition of competence-based shortcomings, described himself as “pretty bad at English”. When probed, he stated that he “always gets shouted at”. He did not elaborate to explain whether this was due to behaviour issues or attainment, though it is unlikely he was shouted at for attainment or ability. Regardless, these regular interactions with his English teacher(s) have led Joe to the belief that he is not as competent in English as in other subjects. This experience was not described by any other students who took part in any focus groups.

Joe was not known as a well-behaved student, and frequently would be told off for not following teacher instructions, incompleteness of work, or disrupting the flow of lessons.

Box 5.15 - Context around participant behaviour in the classroom

In addition to the students’ own benchmarks for competence, three students also referred to benchmarks that they had experienced from their teachers. Stewie said his English teacher(s) “say I should be getting 8s and 9s in English”, but that he was perceived as underperforming for not reaching those grades in English, which he found frustrating. Later, Bonnie explained that she tends to feel extremely stressed “when people [perceive] you as the smart kid” due to the chance that she won’t meet the expectations that others have of her. Meg agreed with this, stating that if she doesn’t do well in a test that her teachers won’t consider her as good a student as previously. These comments from Bonnie and Meg helped to justify why they had ranked ‘competence’ so highly in the sorting task at the end of the focus group, and supports the point made in previous sections that they see their academic ability and others’ perceptions of that ability as a key part of their identities, and emphasises their fear of feeling that they had let others down. Further, while these students may have experienced identified motivation, the ego-focused aim (or pressure) to meet the expectations of others relates to introjected motivation for these three students. This differed

with the other three focus groups where competence had consistently been ranked in the bottom three factors affecting motivation.

In addition to the comments from Stewie in the **Error! Reference source not found.** section relating to being compelled to complete tasks for his revision that he did not believe helpful for him; there were further comments relating to the types of tasks students wanted to complete. There was a debate in the second year 10 focus group about the extent to which students should have autonomy in their revision. For example, Peter demonstrated frustration at not being able to choose his own revision tasks, like Stewie, whereas Meg and Bonnie, as mentioned in the previous section, argued that the lack of autonomy shown in being given specific tasks by a teacher removed the difficulty in deciding what to do, with Meg arguing that specific tasks being set gave her a helpful starting point to work from. In all these cases, students indicate an element of struggle with the lack of autonomy they were afforded.

Stewie explained that the result of being sorted into a “very able” class in English, his teacher expects the students to “all be really clever”, and that this reduces the time spent by this teacher “actually teaching”, rather than asking the students to work independently to the same extent.

One of the professional development foci of the school related to increasing the time spent on individual practice of answering questions or improving a skill; a class that could be considered higher ability may be more likely to have spent extra time on the practice in order to gain more feedback, rather than time with a teacher stood at the front of a classroom explaining a concept, as Stewie described.

Box 5.16 - Study school professional development on feedback

In addition, Kyle described being aware that one’s ability varied by subject and so students would necessarily have different experiences to each other in each of their subjects. For example, a student that excels in Mathematics may struggle in English, while another experiences the opposite, and this sentiment was described by Wendy (see section 5.4), despite this contrasting with comments students made about being around the ‘right’ peers to support their academic progress. Here, Kyle has commented on not only his own perceived competence, but those of his peers too, and the extent to which they may experience (a lack of) relatedness with each other.

When the students were asked about the extent to which they think they had similar experiences to each other, Stewie and Bonnie made the argument that differing work ethics between students meaning that they necessarily could not have had similar experiences, thereby indicating that they would not be able to experience relatedness with each other. Both Stewie and Bonnie described similar experiences of associating themselves with “smarter people” and finding out that others are deliberately committing time to their homework or revision, which both participating students said they did not usually do. This supports the comments in section 5.4 from Heidi about who she associated herself with too. Peter and Stewie made the argument that the prior experiences of a student influenced the extent to which those students can experience relatedness. For example, Peter explained that because he speaks another European (Latin-based) language fluently, he found studying far easier than most of the peers in his Modern Foreign Language (MFL) class (in a third but still Latin-based language), and he and Stewie agreed that factors outside a student’s control affect the extent to which two students can have the same experience.

Finally, there were several comments made by students that indicated that they were aware that they and their peers had had differing experiences in general, for example Stan said:

“With people, and the people in the same class as us, obviously learning at the, learning the same thing at the same time there's people who are like, they pick up things easier than other people in the same class, and that's not including the sets, so the sets could also learn at different paces.”

(Stan, Year 11 Focus Group 1)

This statement by Stan emphasises the extent to which students learn differently. Wendy built on this, saying:

“It's not like everyone is learning at the same time and stuff so... It's... it is different, but also it's kind of the same, especially when like you revise after school. Some people like have like a good household to go home to ... and some people don't. So then they also like they're behind 'cause they can't like go home, and revise.”

(Wendy, Year 11 Focus Group 1)

This comment from Wendy helped to emphasise that students’ differing socioeconomic backgrounds had an impact on the ease with which they could complete work outside the

classroom, which will necessarily have differed between students across the focus groups and across the year group as a whole, again suggesting an inability to experience relatedness with each other.

The students, through this section, demonstrated a notable knowledge of the extent to which their experiences were necessarily different for several reasons, including preferences for how they learn, socioeconomic position, and therefore the ability students have to be able to focus effectively on their academic work, and how their previous experiences and therefore personality may affect the extent to which they experience academic motivation. Despite indicating awareness of the advantages of experiencing relatedness through collaboration as explained in an earlier section of this chapter, the points raised by students outlined in this section identify the various ways in which that relatedness may be hindered.

5.7 Factors hindering progress and success

Throughout all four focus groups, students referred to factors that may have hindered their academic progress or success, and their academic motivation too. These included ‘bad lessons’, difficulty balancing workload and time-management (where different elements of each of these were described in section **Error! Reference source not found.**), and difficulty in starting tasks they had been set.

Both Meg and Bonnie referred to the Covid-19 pandemic when discussing missing target grades. They highlighted that their teachers had expectations of prior knowledge, despite the content having usually been taught during academic years that fell during the pandemic. Bonnie described years 7-8 as “foundational”, where “you learn the building blocks of everything”, and suggested that despite the remote options for education during this time, many students had knowledge gaps that made reaching target grades more difficult. It was unclear whether the pandemic and this missed learning was factored into target grade calculations from the teacher interviews. These comments show frustration with the hinderance of their ability to build competence in each subject, and that it makes it more difficult for them to meet the expectations of others, as described earlier.

The provision from the school during the pandemic when schools were closed included opening for a few select students who were socioeconomically disadvantaged, or whose parents were referred to as ‘key workers’ so these students were not consistently left at home alone. In these cases, students were not forced to attend but were given the option. There were also classes taught online by teachers, consisting of one lesson per subject per week. For example, a year 9 science class would normally average three lessons per week, but would be taught one lesson online. Additional lesson time was made up of independent work set for students, which they should have completed and uploaded evidence of to the online learning management system that had previously only been used for homework. Participation in the online lessons was usually low, even if students did log in to the lesson, and work completion was generally also low. This may have been partially students struggling to motivate themselves independently, or due to the lack of sanctions available, or both.

Box 5.17 - Education provision during the pandemic at the study school

Chris and Joe both made the argument that feeling compelled to work hard in one subject in order to improve competence necessarily meant that they could not work as hard in another subject. This demonstrates students' introjected motivation through attempting to meet the expectations of others, as well as a lack of autonomy in their time management. Beyond this, Bonnie stated that her high workload and the large volume of content to learn made her stressed, which then impacted her perception of her competence in a range of subjects that she may have struggled to fit all the work in for.

When considering the pressure that students may have found themselves under, Cleveland, after arguing that a single missed homework would not affect his GCSE results, perhaps demonstrating experience of teachers using fear appeals, made the point that confidence and ability were more important for final results than the effort spent on homework, supporting comments made by Heidi earlier in this chapter. He also made the point that the target grades that students were issued helped to support the confidence (and perceived competence) that students should have had in their own abilities. One could infer that this assumed target grades align with the students' own views of their competence, and are not too low, conflicting with claims from Chris and Cleveland at another point in the focus group.

In terms of the frustration of progress, Chris described seeing his peers understanding concepts more easily than he did, since he found it demotivating to experience "trying his hardest" and still finding it more challenging than others had. He accredits this to his peers being "naturally smarter" than he was, though comments made elsewhere in this chapter would refute this given that the competence a student had in any given subject would vary depending on which subject was in question at the time. Separately, Chris gave an account of a recurring scenario he finds himself in, where when he has a "bad lesson", meaning he did not understand the concepts covered fully, he described finding this demoralising and so would find himself lost both in that lesson as well as later during the same topic, or even in unrelated lessons later in a given day.

The setting of large amounts of homework by one subject may also have negatively affected the time available to spend on other subjects, as highlighted by Kenny saying

"You may personally want to like spread out like 30 minutes over three days of all the subjects then if you have to do three hours of one subject, [...], you're maybe having

to cut down revision on one subject, because you need to do more of this one because the teachers have set more so you don't have too much control."

(Kenny, Year 11 Focus Group 1)

Stan supported this by adding, when referring to inconsistent amounts of homework being set "it could be 3 hours, it could be 10 minutes, and I don't really know how to manage that" (Year 11 Focus Group 1). This distinct lack of autonomy meant that students may have felt they did not have the sufficient time to complete all the work that they wanted to; one could argue it is unreasonable to expect students in KS4 to be improving their time-management for later in life when they are given unrealistically high workloads with insufficient warning to manage their time effectively.

Homework was another focus for improvement in the school during the time around when the study took place (and was one of my foci in my leadership role within my subject department). Whilst there were some guidelines provided centrally regarding the amount of homework that teachers should be setting per week, this seemed to have manifested itself with extreme inconsistency between different subjects, and between different teachers within the same curricular department. It may be important to note that, especially in the first year 11 focus group, students commented on how helpful they found the use of homework timetables and knowing roughly the quantity and regularity of homework setting for planning their own time. Homework timetables dictated when a given subject would set homework, and when that homework would be due. In my own classes, I found that by having a specific day to set and check homework each week, students reported being more able to plan their time and complete the homework in time.

Box 5.18 - Homework policies at the study school

Brian expressed that he felt guilty when he did not revise, showing introjected motivation. He explained that he felt that a lack of work is what led to the results he was achieving, and that they were often seen as disappointing since he believed they were not reflective of his true ability, perhaps damaging his perception of his own competence. When asked for a perspective on the same prompt during this focus group, Lois indicated agreement with Brian. Brian later, supported by multiple other students, explained that he found "the hardest part of studying at home in your own time is actually getting started", but that once

he had already started, working independently was “not that bad”. There were no other comments made about this, though it may be linked to the point made by Wendy, described at the end of section 5.6 about socioeconomic disadvantage and the workspace that may (or may not) be available at home. These comments also demonstrate a desire from these students to conform to expectations from teachers or parents, and indicate elements of controlled (i.e. introjected) motivation in the students.

As demonstrated by this section, students are aware of multiple factors that may hinder their academic success, in some cases through hindering autonomous motivation. In addition to students’ reference to the loss of learning during the Covid-19 pandemic and the impact this had on students’ confidence and perceived competence, there was again reference to a lack of autonomy in their ability to manage their own time because of homework tasks being set inconsistently between teachers. It is important to note however that some teachers *were* consistent and regular with their homework setting and students showed an appreciation for this.

5.8 *Changes over the year*

Most of the themes uncovered during the process of analysis did not indicate a change in perspective, while the four focus groups did help to describe the *difference* in perspectives of students as expected according to the research design (see chapter 3 Methods). However, the lack of mention of a theme in the first or second focus group where it was mentioned in the other does not necessarily indicate a change. Given that, as discussed in chapter 4, there were no statistically significant changes in the quantitative data, it is believable that there were no notable changes through the year. However, this section will briefly discuss a few points that were raised at the beginning of the year but not at the end, and vice versa.

The only point that was raised in the second focus group for both year groups that was not mentioned in the first was the long-lasting effects of the Covid-19 pandemic on students' prior learning before beginning their GCSE courses. Further detail on the extent to which this hindered students' progress was described in the previous section. The reason this was the case was unclear, though students may have identified progressively more missing knowledge (as described by Bonnie) as the year went on, meaning students were more cognisant of those gaps by the second focus group for each year group, representing a changing perception of one's competence.

There were more points raised in the first focus group for each year group that were not raised in the second. There were only four sub-themes that arose in the first focus group for *both* year groups (and not in the second). The first of these was the introjected motivation shown by students wanting to avoid missing their target grades, and this was described further earlier in this chapter. Next, the description of one way in which students experienced relatedness with one another through the comments that students made about competition with their peers, primarily peers in the same class as them in a given subject, being motivational also only appeared in the first focus group for each year group; further detail was given on this in section 5.4. Third, the reference to working to improve and build competence in one subject necessarily meaning there was less time available to work in other subjects also only came up in the first focus groups, and this was covered early in the previous section. Finally, students in both year groups suggested that they enjoyed learning new concepts more so than they enjoyed revision. For example, Joe said he would "rather learn something new and improve [his] knowledge on something than keep repeating the same

thing” (Year 10 Focus Group 1). One could make the argument that improving on existing knowledge would necessitate some repetition of a previously covered topic, but he, along with Brian and Chris, were clear that new concepts are more interesting to learn about than revising other topics.

In summary, the changes in focus through the year, based on statements from students, included increased reference to learning loss due to the pandemic and to mental health issues students may have been facing. Additionally, there was a reduction in reference to competition between students. Finally, there was a lack of reference to enjoying learning more than revision. While it is true that the mention of these themes by students changed through the year, again it is worth considering that non-mention of a theme does not necessarily mean that the theme is not a factor in students’ motivation or academic outcomes.

5.9 *Other notable comments*

In addition to the themes described in the sections above (and a description of how little had changed from the beginning to the end of the year), there were a few points raised by students that do not align with the discussed themes but may still represent an important factor in their academic motivation and outcomes. Firstly, students presented conflicting arguments about the extent to which they perceived their own competence as a motivator, and the extent to which they enjoyed their learning. There is also additional consideration for mental health issues students may have faced, and some comments teachers made during their interviews that support or refute statements by students. These are discussed in this section.

5.9.1 Perceived Competence as a Motivator

Chris suggested he was more likely to work to improve his grades in subjects that he initially struggled more in. However, this contradicted a comment he made elsewhere in the same focus group, making it unclear whether he worked to improve in subjects he was less confident (or competent) in, or whether he gave up on those subjects more easily in favour of focusing on subjects where he felt more confident. One could interpret this as Chris knowing he needed to do well in his exams, even if he didn't always follow through on that knowledge.

During three of the four sorting tasks, competence was ranked as one of the least important or significant factors in students' academic motivation. The exception to this was the second year 10 focus group, where students ranked competence far higher. Whilst students suggested they did not value the effect that their perceived competence might have had on their motivation, there were a range of comments in all four focus groups to suggest that it was more significant than the ranking suggested. Examples of this opposite argument included Chris describing his desire to work primarily on subjects where he had achieved lower grades, Chris and Cleveland describing feeling motivated by a fear of failure, or Heidi working with her peers to improve her performance in a given subject. Further, both Meg and Bonnie indicated that they wanted to maintain a perception in others of being intelligent. Finally, students in both year groups described completing tasks to avoid feelings of guilt.

Bonnie specifically described being actively de-motivated having experienced missing her target grades regularly, providing an example of 'feeling like a failure'. These comments together suggest, in spite of the low ranking of competence in the task at the end of each focus group, that students' perceptions of competence as well as their desire to conform to the expectations of themselves are important for their academic motivation.

5.9.2 Enjoyment of learning and subject choice

There were some elements of intrinsic motivation displayed by several students. Glenn described an inherent interest in learning some subjects and so chose to spend some of his time working further on these (as did Lois) and Stewie described enjoying learning new things, describing humans as "naturally curious" (Year 10 Focus Group 2), and Bonnie described learning new things as "fun" (Year 10 Focus Group 2). Separately, Meg described taking advice on how to improve assessment grades since she saw this as more important than meeting a target grade, and this point echoed what students had described in the first year 11 focus group. Chris feeling more motivated to try harder in his work due to feelings of competence, for example after assessments. Finally, Heidi explained that she believed effort and attitude to learning was more important than competence, saying "at least you know you tried" (Heidi, Year 11 Focus Group 1). In the first year 11 focus group, all five students agreed that they enjoyed learning about new concepts at some point in the focus group. Eric also implied that he believed all students would be intrinsically motivated by something, though whether he was referring to different academic subjects or non-academic activities could be inferred differently. In year 10, Brian and Lois suggested they also enjoyed learning new things. These comments support that students, at least to some extent, enjoy their learning, supports the development of (some) intrinsic motivation in most students. In addition, these comments may somewhat reflect the autonomy students experienced when choosing which optional subjects to continue studying to GCSE level, including several options that would be new to them (for example, Business Studies). This conflicts with the pragmatism some students demonstrated as described earlier in this chapter, since the natural curiosity may relate more to a student's values or ideals compared to efficiency for achieving better outcomes. Joe, Brian and Chris however all indicated that they enjoyed learning new concepts more than revising concepts previously learned, acknowledging the importance of revision

for academic outcomes, supporting the more pragmatic perspective explained earlier in this chapter.

5.9.3 Mental and physical health

Meg explained that the pressure she experienced from others affected her mental health, even if some of that pressure was applied internally. The pressure experienced may contribute to feeling a lack of autonomy in the decisions that she made, but perhaps the mental health issues she experienced, including primarily anxiety, meant there were fewer choices available to her, though she did not describe what she meant by this in further detail. Finally, Lois made a point that a student who is suffering from a mental or physical illness may not be able to perform as well academically. Whilst she did not explain this in further detail, one could consider the implications of being unwell including potential issues such as time available to study, ability to sustain revision or concentration levels, absence from school, or other potential impacts.

5.9.4 Teacher comments

During the teacher interviews, when asked about teachers' use of target grades, Jim described how he used, and did not use, target grades in detail. He said:

So I view target grades as kind of slightly abstractedly I don't kind of... I mean. I know where to find them. I I would know... or I wouldn't be able to rattle off the hundreds of the students who I teach exactly what the target grade is from memory, but I would know where to find it and I would kind of be steered by it. But I take the view that... It's kind of... It's fairly arbitrarily applied based on data that can be quite out of date or it's produced from KS2 data you might end up with. You know, you might have a student who's EAL [English as an Additional Language]. And particularly when they're there might be new to the country in primary school, have extremely low target grade but be incredibly bright and be just as capable of getting the top grades and then you might get some students who will have a target grade of a 7 or 8 and in my own professional view, will have very little prospects of getting even particularly close to that, so I'm a bit nervous about using them... really explicitly with the students.

(Jim, Teacher Interview, March 2023)

This contribution helps to emphasise and validate several comments made throughout the four focus groups. The first notable comment made here is that Jim agreed with students who commented that the data used to generate target grades was ‘out of date’, and therefore makes it clear why teachers take the target grades ‘with a pinch of salt’ and perhaps do not use them so much, at least beyond the first month or two of each new academic year. Additionally, he commented on the grades assigned to students who are categorised as EAL, reflecting the experience that Peter described about having lower than expected target grades. Finally, he commented on students that perhaps had target grades that were too high, again supporting some of the perspectives put forward by students discussed early in this chapter.

Whilst the target grades being aspirational may aim to push students to work hard and achieve their maximum, hearing the comments students made about their target grades being too high and not feeling they could achieve them (to the point of demoralisation) was difficult, and I imagine that some students would be reassured to know that those perspectives were shared by other teachers too.

Box 5.19 - Target grades as demoralising?

5.10 Summary and Conclusion

This chapter aimed to describe and theorise the students' perspectives on the use (or non-use) of target grades, and ways in which this may be affected by other factors that affect their academic motivation. Initially, students described a vast range of experiences of how their teachers used, or did not use, target grades. For example, some teachers supporting students' choice of alternative benchmarks to aim for provided a strong contrast to teachers that use target grades as a minimum benchmark for students to reach, with sanctions for students not meeting the target grades. Students' descriptions of alternative benchmarks to aim for to support their own motivation, including focusing on consistent improvement or use of entry requirements for future study, which were the two most popular alternative benchmarks, demonstrated maturity and pragmatism from the students. These statements indicated that students were cognisant of the impact of the work they were completing for their futures, both academically and otherwise.

Beyond this, students made several arguments that indicated a low level of 'built-in autonomy' to their school experience. This was demonstrated through their experiences relating to pressure and control from parents and teachers or perhaps other authority figures, and through their discussion of life beyond the classroom and in particular their ability to effectively manage their time at home. By extension, some students described ways in which they were attempting to introduce autonomy for themselves, partly through the use of their own benchmarks to aim for (in lieu of target grades). However, students demonstrated varied responses to others' expectations of them, such as pressure due to the impulse to meet those expectations to maintain identity (like Meg or Bonnie), but also through attempting to resist the need to meet others' expectations (like Stewie or Kyle). Finally, despite the students' realistic awareness of each others' differences in circumstances (including socioeconomic position, interest in different subjects, 'natural ability', and more), they were also aware of the benefits of relatedness through collaboration *and* low-stakes competition with each other.

There was also evidence provided by students that they were attempting to be pragmatic about their aspirations for the future, both in education and beyond. The students' descriptions of identifying the grades they needed to be admitted to specific further education courses demonstrate this, as well as being an example of introducing more

autonomy for themselves. The students who were of the opinion that target grades were based on attainment data that was too old to be fit for purpose, and those who explained that they were simply aiming to improve on their previous grade in an in-class test or mock exam, provided further examples of pragmatism. The pragmatism demonstrated by some of the participating students highlighted that students were able to identify the best way to motivate themselves.

Although they were arguably less prevalent, there were other themes identified in the students' responses, spanning the various factors affecting motivation in this chapter. These included students giving examples of perceived injustices such as their target grades being too high or too low, or a demonstration of a conformist nature of some students, wanting to meet others' expectations of them and internalising those expectations, creating pressure. Additionally, there were some contributions from students indicating that their academic performance forms part of their identity and hence are motivated to maintain that performance. Finally, there were also ideas put forward indicating the effect of social influence, such as competition with or pressure from their peers, including a desire to demonstrate their competence.

The perspectives provided by students (and context provision supported by teacher interviews) were helpful for providing explanation for the various motivation types that students experienced and the extent to which students experience multiple motivation types simultaneously. These, in line with the themes identified that have been outlined here, help to further explain the students' varying perspectives on target grades, and their interaction with academic motivation in general. In the Discussion in the next chapter, the findings here are further synthesised, and triangulated with the quantitative data outlined in chapter 4. This synthesis is then discussed in relation to the literature outlined in the Literature Review, such that conclusions can be drawn to answer the research questions.

6 Discussion

6.1 *Introduction*

Following the justification for the study based on the Literature Review, and the findings from the quantitative and qualitative data (in chapters 4 and 5), this chapter will discuss how the data relate to said literature. The themes outlined in chapter 5 as discerned from patterns in the qualitative data are loosely replicated here, with consideration of the relevant quantitative data in each section. These triangulated data reveal both common and differing viewpoints of students, and their varied motivational positions on the autonomous-controlled scale (Gagné & Deci, 2005).

This chapter first discusses students' perspectives on the use of target grades, provided both qualitatively and quantitatively, and how this aligns with the literature. The first section highlights the alignment between those perspectives and how they are related to self-determination theory (SDT), for example by examining students' perspectives on their own competence in each subject, and how optimism here can support improved academic outcomes (Perry, Davies & Qiu, 2018). Additionally, there is consideration of how students' pragmatism relates to their autonomy, both through students' recognition of the importance of their education and the values students held relating to their education. There is also further theorisation of the varying motivation types experienced by students.

Subsequently, there is discussion of students' lack of autonomy demonstrated both through their focus group contributions and the SRQ-A data analysed. A lack of autonomy was a common theme identified through this study, though there were indications that sometimes the pressure and control experienced could be helpful. Following this, in section **Error! Reference source not found.**, is discussion of the ways in which students experienced relatedness through collaboration and competition with their peers. This will include students supporting each other to build academic competence, as well as usually friendly competition to encourage harder work in order to score higher than their peers on low-stakes assessment. There were a number of factors described by students in the focus groups that may have hindered their academic motivation and progress. These will be largely discussed elsewhere throughout this chapter as they arise, however the penultimate section of this chapter

includes consideration of the Covid-19 pandemic and students' experiences of feeling guilty when they don't work, among some other factors. Finally, the change in each of these themes over the course of the year in which the study took place is discussed; there was found to be relatively little change over the year.

The discussion of each of these themes will allow the next and final chapter to directly address the research questions posed in section 2.7 in the Literature Review to draw final conclusions.

6.2 *Student Perspectives on Target Grades*

In chapter 5, the students' perspectives on the use, or perceived non-use, of target grades by their teachers was outlined, with students expressing both positive and negative experiences. The first such perspective was Wendy's description, with similar experiences described by her peers, of receiving sanctions for not meeting her target grades in assessments, such as compulsory re-sits of assessments and being obliged to spend additional time in a classroom completing revision. This emphasis of an outcomes-focused culture at the school, rather than focusing primarily on building a learning climate and students' enjoyment of learning conflicts with the conclusions of MacNeil, Prater and Busch (2009). They indicated that by aiming to build a positive and encouraging school-wide culture that concentrates on improving students' learning is what leads to the positive student outcomes. One could infer that, contrastingly, excessive focus on the students' *outcomes*, rather than the process of learning, may not be so helpful; this may be especially true where teachers are coupling their focus on outcomes with the use of fear appeals and if the students perceive such as threatening (Putwain & Symes, 2011a; Putwain & Symes, 2011b; Putwain, Remedios & Symes, 2015), including the sharing of negative expectations of students' outcomes, potentially leading to self-fulfilling prophecies of underperformance by students (de Boer, Bosker & van der Werf, 2010; Jussim & Harber, 2005; Rosenthal & Jacobson, 1968). Further, the use of sanctions or re-sitting assessments without supporting students to improve their work first is unlikely to support students' perceptions of their own competence (Ryan & Connell, 1989; Gagné & Deci, 2005), concluded to be the most important of the three tenets of SDT by Bureau et al. (2022) in their meta-analysis.

Another negative perspective on target grade use that Peter described, aligning with my own anecdotal experience, was that his target grades were too low, most likely because of his English as an Additional Language (EAL) status, despite being a fluent English-speaker. This leads one to wonder whether the use of target grades without use of additional testing beyond the assessments and tests described in the Introduction chapter is helpful, especially for EAL students; this provides an additional example of where some students may experience damage to their perception of their competence, though in cases like that of Peter, if he takes 'beating' the target grade as a challenge, this may still be helpful to him for his academic motivation (Putwain, Remedios and Symes, 2015). Where the target grades provided for

students are then perceived as too low by the students, the teacher may find it challenging to share positive expectations of a student's outcomes if this conflicts with a target grade, again introducing the possibility of a negative self-fulfilling prophecy for the student whereby they perceive low expectations, and then fall to those expectations, and so on. The argument that target grades may not be appropriate for use stems from the age of the data with which target grades are calculated. Where data are often at least three years old by the time of calculation, Peter again (with agreement from peers, and reiteration in different focus groups) argued that these grades were not appropriate. The pragmatic justification for this from students consistently aligned around the idea that the data are too old and there is too much time for changes in circumstances for a given student, for example mental health issues or changes in values, which may in turn affect students' outcomes more than their academic motivation would. While it may be reasonable to suggest that data used to generate target grades is older, this refutes the argument from Leckie and Prior (2022) that this prior attainment data is the "most important" (p. 441) predictor of the grades students finish their GCSEs with, even if there is still a degree of unexplained variance when modelling students' likely outcomes.

The case that students' target grades were too low came up elsewhere in the focus groups too. Eric described this as demoralising, and said that he felt "underrated" by his teachers (see section 5.1). However, elsewhere students argued that their target grades were too high, for example Kyle arguing that he was unable to 'catch up' to the target grade from the current grades he was receiving early in year 11 (section 5.1). Kyle, with others, extended this argument by highlighting that on occasion, teachers did not provide enough feedback or time for improvement, linking to the experiences shared by Wendy earlier. In these cases, Eric indicated a resistance to these expectations with the belief that he would finish his GCSEs with grades higher than his target grades, supporting the indication by Perry, Davies and Qiu (2018) that optimism about one's competence is associated with improved outcomes as well as supporting the argument by Putwain, Remedios and Symes (2015) that interpretation of fear appeals as a challenge may support improved perceived competence. Where Eric had been encouraged by his teachers through sharing positive expectations of his outcomes, whether he believed it or not, this seemed to support his motivation to meet those expectations (Gregory & Huang, 2013). There is also an argument that Eric, and perhaps

others in the wider sample of students with a similar view, may have been exhibiting an element of academic entitlement (Fromuth et al., 2019; Greenberger et al., 2008), believing that they would achieve 'good' grades just by virtue of being at this specific school given its strong prior academic performance on average, as described by Michael (February, 2023) in his interview. Conversely, Kyle (along with Meg and Bonnie) demonstrated that they felt a need to conform to the expectations of others, introducing an element of external pressure and controlled motivation types due to the internalisation of others' expectations of their academic performance. In both of these cases, again these experiences are not likely to be conducive to support students to build their own competence, nor to improve their perceptions of their own competence (Gagné & Deci, 2005; Bureau et al., 2022) and therefore potentially damaging the extent to which these students were autonomously motivated. Where these external expectations from teachers included the use of fear appeals, Putwain and Symes' (2011a; 2011b) conclusions that lower self-efficacy in students, or reduced perceptions of their own competence, were more likely to be perceived as *threatening* by students therefore increasing students' anxiety about their upcoming exams again would be unlikely to support the students' perceptions of their own competence. Additionally, Gregory and Huang's (2013) findings that students experiencing higher expectations of others increased the likelihood of students meeting those expectations may apply here, but this would still likely not support students' *autonomous* motivation. Given that students showed split views on whether target grades were too high or too low, there is an argument that the target grades are, at least on average, pitched approximately where they should be. Further, it may be worth noting that while the expectations that teachers shared with students, if framed the right way (Smith et al., 2018), may support improved outcomes for students (Gregory & Huang, 2013), these expectations alone would not be enough to notably influence students' academic motivation (Permzadian & Shen, 2024).

Not all perspectives shared relating to target grades were negative. Meg, Bonnie and Stewie all separately described examples of their teachers using their target grades as a justification to 'push' them to work harder to achieve higher grades, and identified this as positive. Additionally, Heidi described experiencing positive encouragement from her teachers, using her target grades as justification for this. The positive framing of target grade use by teachers in these examples support the findings that teachers' use of positive and

encouraging language can support students' academic motivation, perhaps building optimism (Perry, Davies and Qiu, 2018), and in turn, academic outcomes (Smith et al., 2018). Despite the inconsistency of studies to support this, where teachers use target grades as an aspirational benchmark, this may support students' in rising to meet that teacher's positive expectation bias (Gregory & Huang, 2013; de Boer, Bosker & van der Werf, 2010) and their use of the target grade as a justification for it. This may be true even if the effect is only small (Brophy, 1983; de Boer, Timmermans & van der Werf, 2018; Jussim & Harber, 2005). In all of these cases, the students' positive views of these encouraging teachers indicated that their higher quality teacher-student relationships additionally benefited, likely supporting improved engagement from these students, aligning with Quin's (2017) analysis as a result of students' increased perceptions of their own competence, considered the most important of the three SDT strands (Bureau et al., 2022).

The wide range of perspectives provided by students relating to target grade use, including both positive and negative, as well as the idea that target grades were simultaneously too high and too low, support the quantitative data generated by the wider sample of participating students (including those in the focus groups). Given that the median value for target grade affinity index (TGAI; see section 4.2) was consistently 0 at all three data collection points for both year groups, combined with the mean TGAI values being so close to 0, suggests that students across year groups could be described as ambivalent toward target grade use, even with consideration of the wide range of views expressed in focus groups, and the range of TGAI values generated along an approximately normal distribution. The marginally smaller range in TGAI values returned by year 10 participants may be in part due to the fact they had far more limited experience, though not none, with their target grades compared with year 11. Students in year 11 had experienced their teachers' use of target grades more, and therefore were perhaps more likely to have formed opinions about their use. The alignment of the quantitative and qualitative data here supports trustworthiness in these findings.

Finally in this section, the modest dependence of the TGAI on students' autonomous motivation levels (according to their relative autonomy index (RAI)) but lack of dependence on *actual* target grades may support the idea that target grades as an external and controlled motivator provide an excuse for teachers to sanction students with lower autonomous

motivation levels, regardless of actual ability. There is potential that this may lead to issues surrounding a hidden curriculum (Gillborn & Youdell, 2000) having a negative impact on students beyond school, though this is beyond the scope of this thesis.

Overall, this section makes it clear that, largely, students did not value the use of target grades by teachers, though there was evidence of some students finding them mildly helpful. Students demonstrated some pragmatism here, making peace with the controlled motivation associated with target grade use by some of their teachers for the sake of their academic progress.

6.3 Autonomy and Students' Alternative Goals and Motivators

In addition to the general ambivalence students had towards target grades and their use, there were numerous suggestions made by the students about other ways they motivate themselves, or other goals they aimed for in lieu of target grades. These included focusing on the predicted grades generated by teachers, use of entry requirements for courses of study in the future, and aiming to exceed previous current grades. In combination with the quantitative data, these suggestions are discussed here.

Most of the suggestions made by the students for alternative motivators or goals to aim for demonstrated that they were taking a pragmatic view on their academic achievement. Several students had identified that the entry requirements for courses of future study they wanted to enrol in would be a sensible benchmark to aim for, such that they can be admitted onto the course. Students seemed to have identified the courses they wanted to study at A level through either interest in the subject, or based on what they believed would set them up best for the future. In some cases, students had decided to set their own goals, with their future plans in mind. In one case, a student had decided on their own grades to aim for, seemingly arbitrarily and without indicating that their future goals were kept in mind when deciding on these goals, though that is not to say their future was not a factor. Consideration of their own potential for success, likely each having slightly different definitions for what success meant to them (Godfrey-Faussett & Baird, 2025) in each of these cases, taking such a pragmatic view and identifying what would benefit them the most, necessarily required students to make use of their academic autonomy where it was available to them (Ryan & Connell, 1989; Gagné & Deci, 2005; Howard et al., 2021). These perspectives demonstrate examples of identified motivation, and the value that achieving a given grade would have for their future, aligning with Permzadian and Shen (2024), as well as examples of students attempting to introduce more autonomy for themselves. These suggestions align well with the SRQ-A data showing that identified (autonomous) motivation was consistently the most common motivation type across both year groups, despite a larger proportion of students aligning with controlled motivation over autonomous motivation in general. Additionally, students' recognition of the importance of their academic grades for their academic futures and beyond education, implies a positive recognition of the value of education. This may stem from encouragement from teachers (Smith et al., 2018; Guo & Zhou, 2021; Siekmann et al.,

2023; Gregory & Huang, 2013), or it may be rooted in the education level (Froiland & Worrell, 2016) and the positive valuing of education by parents being passed to their children, the students (Baker & Barg, 2019), or both. Alternatively, this may stem from teachers' use of fear appeals with reference to students' future aspirations should they (fail to) meet a given grade (Putwain & Symes, 2011a; Putwain & Symes, 2011b), potentially providing an example of where fear appeals may lead to mastery-approach (i.e. autonomous) goals in the students. Permzadian and Shen's (2024) argument that external expectations may not be enough to notably affect students' motivation, where students placed value in their education already, they experienced improved academic motivation. In any case, students' decisions to identify their own goals (e.g. see comments from Stewie and Peter in section 5.2) and use of their autonomy likely supported their academic outcomes (Howard et al., 2021).

Glenn and Peter's suggestions that predicted grades were a more helpful motivator than target grades were centred around the arguments that target grades were generated from older data (corroborated by Michael (February 2023) and Jim (March 2023)). Additionally, Glenn made the point that any number of external factors may have affected a student's final outcomes, regardless of their academic motivation, target grade or 'natural ability'. Additionally, they argued that these predictions were based on teachers' knowledge of the students and their work in a given subject. It is true that this continues to demonstrate a pragmatist perspective and demonstrates autonomy, as the last paragraph explained, however these views may be in conflict with the point made in the Introduction that some teachers' predicted grades may indeed have been affected by the target grades students had been issued, introducing bias into the teachers' predictions based (indirectly) on the data used to generate the target grades anyway.

The students' contributions to all four focus groups demonstrated that individuals were capable of exhibiting more than one motivation type, even if students primarily identified with just one motivation type. Across all focus groups, there was almost no evidence of students experiencing intrinsic motivation, corroborating the low proportion of students associated with intrinsic motivation in section 4.5. It may have been expected that more commonly, even if not predominantly, students would have described some form of enjoyment of their learning beyond preferring learning new content to revising previously covered topics. Besides the brief mention by Brian and Lois that they enjoyed learning new

things, the most concrete (and only other) example of intrinsic motivation came from Stewie, invited to the focus group for his amotivation, expressing that humans, and therefore students, are likely to experience some sort of 'natural curiosity' and therefore exhibiting an inherent desire to learn. This single comment from Stewie indicated that he did not experience solely amotivation. Since intrinsic motivation is dependent on the enjoyment of learning or inherent interest in a topic, this comment aligns with suggestions in key literature around SDT (Howard et al., 2021; Ryan & Connell, 1989; Gagné & Deci, 2005).

Finally, several students indicated that rather than aiming for benchmarks, arbitrary or set by their potential future education establishments, they were solely aiming to improve on previous current grades. Some students explained that this was due to encouragement from teachers (Smith et al., 2018; Gregory & Huang, 2013), and others seemed to come to this position themselves through their enjoyment of learning, though this was not explicitly stated. Students' choice of this aim continues and extends the autonomous pragmatic theorisation from previous paragraphs, showing examples of identified motivation and to a limited extent, intrinsic motivation (Gagné & Deci, 2005). This position shows that these students were focused more so on the process of learning and building their competence rather than focusing on their outcomes, with the view that improved outcomes would naturally follow (Smith et al., 2018; Guo & Zhou, 2021; Siekmann et al., 2023). Firstly, this supports the idea that building a school-wide culture around the process of learning and improvement (MacNeil, Prater & Busch, 2009) is helpful for students' engagement, though this conflicts with the outcomes-focused culture that was being fostered in other teachers' classrooms. The positive culture built in *these* classrooms however also may have supported improved peer engagement in the presence of the teachers during lessons. The affinity students showed here for building competence in each subject again supports Bureau et al.'s (2022) findings that competence was the most impactful tenet of SDT, but there may also have been opportunities for students to experience improved relatedness too (Ryan & Connell, 1989; Gagné & Deci, 2005), further supporting students' autonomous motivation and perhaps therefore also supporting their academic outcomes (Howard et al., 2021).

In combination, these students' accounts highlight the various pragmatic ways in which they motivated themselves. This included using a variety of grades as benchmarks to aim for, though some students believed that simply aiming for iterative improvement was

'enough'. These perspectives also demonstrated the importance for students, even if only subconsciously, of experiencing autonomy and competence in their academic work.

6.4 *Students' Lack of Autonomy*

In chapter 5, students explicitly described ways in which they experienced autonomy, and ways in which they experienced a distinct lack of autonomy. During the four focus groups, the students largely centred their points around the pressure they experienced from a range of sources, and in the case of Eric, encouragement he experienced at home, rather than pressure. It may be noted that the general lack of autonomy described in section 5.3 (and elsewhere in chapter 5), despite student efforts to introduce more autonomy for themselves, aligns with the quantitative data returned. When students' relative autonomous motivation levels were calculated, students were most commonly found to experience controlled motivation. Further, the mean and median RAI values for students in both year groups at all three points consistently being negative with no statistically significant change across the year emphasises the extent to which students did not experience autonomy. However, it should also be noted that broken down further, students also most commonly experienced identified (autonomous) motivation, so there were elements of autonomy present.

Several students described (or agreed with a description) of their teachers "fearmongering" (Cleveland, Year 10 Focus Group 1) through explanation that not working in a lesson or completing homework would lead to poor outcomes for students. This was aligned with students' experiences of "overwhelming" (Cleveland & Brian, Year 10 Focus Group 1) pressure to succeed from their teachers. Not only does this align with literature on fear appeals leading to increased anxiety and reduced student self-efficacy (or perceptions of their competence) (Putwain & Symes, 2011a), but also aligns with the school seemingly placing emphasis on controlled, extrinsic motivators such as sanctions or compulsory intervention indicated a lack of autonomy for these students (Ryan & Connell, 1989; Gagné & Deci, 2005), and potentially also a fear of lacking the competence (Bureau et al., 2022) to be able to continue with plans they had for beyond their GCSEs. Some of this pressure from teachers may have stemmed from the target grades students had been issued, though the students did not explicitly suggest this. The ever increasing pressure from government bodies to continue to improve outcomes for students through "demand[ing] accountability from individuals" (Tomlinson, 2001, p. 43), including both students and teachers, may also have contributed toward this pressure. As indicated by Soenens et al. (2012), where teachers experienced more pressure, this may have led to more use of controlling methods used with

students in the classroom, necessarily meaning a reduction in autonomy- or competence-focused need support for students, hindering autonomous motivation in students (Van den Berghe et al., 2012).

Beyond describing pressure from individual teachers, the deadlines students were held to to complete homework for multiple teachers simultaneously made it challenging to manage their own time, with workloads across subjects that competed for their time outside the classroom with the potential for sanctions. In some cases, this was described in the context of students' ability to engage in extracurricular activities, and the time they had available to do this consistently (see comments from Heidi, Stan, Eric and Kyle in section **Error! Reference source not found.**). It is true that the commonality of these experiences does improve relatedness of experience between these students, and likely others who participated in the psychometric testing but not the focus groups, though this negative experience also again demonstrates a lack of autonomy through external and controlled motivation for the students from teachers. Spera's (2005) conclusion that more authoritative parenting styles were associated with better academic outcomes may also be applicable to authoritative *teaching* styles. However, one could consider whether the punitive nature of these experiences may reduce students' perceptions of competence and therefore the expectancy they had of their own outcomes (Permzadian & Shen, 2024). The potential academic benefits for student outcomes of this control conflict with Gillborn and Youdell's (2000) arguments relating to the "authoritarian" (p. 206) methods used by schools to ensure the highest grades possible for their students may have lasting negative impacts on students. The use of sanctions that students did not deem fair likely would not have supported fruitful teacher-student relationships (Roorda & Koomen, 2021). Further, where feedback or support following these prescriptive tasks was not provided, students' motivation may have additionally suffered (Wu et al., 2024).

To contrast these views, Brian and Glenn explained that they found the pressure helpful for their motivation, and appreciated the extrinsic motivators provided to complete their work and exhibited a combination of external and identified motivation. The alternative arguments that a lack of autonomy (Ryan & Connell, 1989) in choosing revision tasks for example (i.e. teachers providing specific tasks), as well as the identified motivation of Brian and Glenn, return to a pragmatic view students took on their education and the most efficient

way to reach improved academic outcomes. This also may provide another potential example of where teachers' use of fear appeals may support students developing goals that focus on the process of learning in order to rise to the 'challenge' of those fear appeals (Putwain, Remedios & Symes, 2015), even if there is an underlying focus on the outcomes, again also indicating an attempt to exercise autonomy and effort to build competence, even if the latter was largely for the sake of exam performance. The point earlier about the potential for authoritative teaching practices to have the potential to support outcomes may, in these examples, have been appreciated by students, contradicting the idea that teacher-student relationships may be harmed but instead may benefit (Alqassab & Léon, 2024; Quin, 2017).

Meg described experiencing pressure, but indicated that this pressure came from within. She may have additionally experienced pressure from her teachers or parents, or perhaps her interactions with these adults *induced* her own feeling of pressure. Regardless, Meg implied that being a 'high performer' was part of how she perceived herself and her identity, and therefore she felt a need to keep intact that identity. This goes to support the findings that competence is an important aspect of motivation (Bureau et al., 2022) and demonstrates an example of students exhibiting introjected motivation (Gagné & Deci, 2005) through a need to perform to a certain standard for the benefit of others. Meg described this pressure as affecting her mental health. It was not clear whether the support she received (as described in chapter 5) was provided solely by the school or whether external services also played a role (Garside et al., 2021) though it is promising that the school's culture for mental health support (MacNeil, Prater & Busch, 2009) was present and likely additionally supported Meg's academic outcomes. One could wonder if the previously mentioned governmental pressure on schools (Tomlinson, 2001; Chitty, 2009; Perry, 2016) may have contributed indirectly to the pressure Meg experienced, especially given their push on students achieving specific benchmark grades and schools' aims to ensure students met these (Gillborn & Youdell, 2000). In this specific case, where Meg had said elsewhere that she was consistently aiming for top grades (as opposed to 'pass' grades), this is unlikely. However, the point may well apply to a number of other students that experienced similar pressure.

Despite explaining their experiences with a lack of autonomy, both Peter and Glenn indicated that they found the lack of autonomy, and therefore the pressure applied to them from their teachers, and perhaps parents, helpful. Demonstrating identified motivation

(Gagné & Deci, 2005), they explained their recognition for the importance of their education and therefore for completing individual tasks set by teachers, while also explaining that the threat of sanctions meant they were more likely to complete tasks. This explanation aligns with what one might expect given Gregory and Huang's (2013) findings that some expectation may lead to improved likelihood of achieving a given goal. Further, these experiences support the pragmatic view students commonly held about the best way to achieve the best grades possible.

The sole account from a student of experiencing autonomy outside of school came from Eric, describing the encouragement (but not pressure) he received from his parents to complete homework and work hard during schooltime. Despite not explicitly describing enjoyment of learning (therefore associating Eric primarily with identified motivation), he was acknowledging recognition of the importance of education and the need to build competence (Bureau et al., 2022) across a range of subjects. This indicates positive values toward education from Eric's parent(s) (Baker & Barg, 2019) that have been passed on, but also may demonstrate the potential applicability of Smith et al.'s (2018) conclusion that encouraging language from teachers may be supportive for students' academic motivation, and this parental involvement may be positive for academic achievement too (Patall, Cooper & Robinson, 2008), especially if that parental involvement relays the parents' expectations of their child (Gregory & Huang, 2013). Parental involvement that is more authoritative may also support outcomes (Spera, 2005) though this does not apply to Eric's experience in particular.

Whilst students may benefit or be happier overall with increased autonomy, a teacher may argue that this would not necessarily be a good idea for students who have minimal autonomous motivation, or are amotivated. In conflict with Gillborn and Youdell's (2000) argument that pragmatism is a weak justification for an authoritative education system, teachers may respond that logistical issues or a lack of time due to workload would make more autonomous education methods too difficult to be practical. This section has demonstrated that students consistently experienced pressure and a lack of autonomy through homework setting and other pressure from teachers, though in a few pragmatic cases this was seen as helpful for students' motivation to achieve better academic outcomes, providing examples of identified motivation. The points made in this section may go some

way to further explaining why students made effort to introduce autonomy for themselves as described in the above section of this chapter.

This section highlighted students' limited autonomy in school, given the students' contributions relating to pressure from their teachers, and in some cases, parents, the sanctions that may come with perceived underperformance, and student workloads. In all cases, students were describing ways in which they motivate themselves in lieu of target grade use. Most students exhibited experiencing controlled motivation, though there was again evidence of pragmatism through acceptance of the elements of control described where they supported the students' own academic goals, demonstrating elements of identified motivation and representing a balance of these motivation types. Though autonomy was often lacking, there was clearly also effort by students to build their own autonomy, for example Eric's description of encouragement from parents leading to more autonomous (though still controlled) motivation.

6.5 Relatedness through collaboration and competition

There was significant discussion of ways in which students experienced (or did not experience) relatedness with their peers, and to a lesser extent, their teachers. This section focuses on the descriptions provided by students about collaboration and competition between peers, and the effects these had on motivation in relation to the literature.

In several ways, students exhibited acknowledgment of the potential effects of social influence inside and outside the classroom. For example, Bonnie described choosing ‘smart’ friends, providing a positive influence on her work ethic, and Stewie described feeling pushed by his peers. In both of these cases, students were using the social pressure they experienced to their academic advantage, again supporting a pragmatic perspective taken by the students, though manifesting in a different way to that described earlier. Heidi explained that when surrounded by others who were less motivated to complete tasks in lessons (or perhaps entirely amotivated), this encouraged her to put less effort in herself, likely in an effort to ‘fit in’ with her peers. Students making use of this social pressure to benefit their academic motivation or outcomes may conflict with the explanations earlier in this chapter that students motivated themselves through an effort to introduce autonomy (and therefore perhaps elements of autonomous motivation), as opposed to the necessarily controlled motivation induced here. These examples do demonstrate differing ways in which students make use of the relatedness they experience with their peers (Gagné & Deci, 2005), though students seeming less impassioned when, and spending less time on, discussing these points during the focus group indicates this forms a less notable method of self-motivation. Bureau et al.’s (2022) finding that relatedness was the least important of SDT’s key strands would support this.

Kyle, Eric and Heidi all discussed the use of grouping students by ability for each subject (‘setting’) at school. In contrast with the evidence against grouping students by ability (Kerckhoff, 1986; Van der gaer et al., 2006; Hallam & Ireson, 2006; Ireson, Hallam & Hurley, 2005), Kyle and Heidi described finding being surrounded by peers of a similar ability, as determined by prior attainment, as helpful for collaboration, supporting the arguments of Lynch, Lerner and Leventhal (2013) that a positive school culture is related to the extent to which students interact with each other in classrooms under supervision. The literature outlined in section 2.4.1 focused on the academic outcomes of students based on the

grouping method they experienced as well as the students' preferences, and while it makes sense that the students participating in this study that were in higher ability groups might feel positively about setting (Ireson, Hallam & Hurley, 2005), I was surprised that Heidi was as positive given that she was, for most subjects, in one of the lower-ability groups herself. Further, the findings by a number of studies that students in lower-ability groups made less (or perhaps negative) progress than their peers in other groups means that their feelings of competence may be damaged (Gagné & Deci, 2005; Ryan & Connell, 1989), reducing their overall academic motivation, even in the face of potentially increased perceived relatedness.

There is still an element of social pressure here despite the positive descriptions of setting provided given that there is an element of competition between students, as described by Chris and Eric, within a given set. Where students were attempting to achieve a given grade for the benefit of others rather than their own outcomes, whether that was their parents, or to 'beat' their peers, this competition (Marsh et al., 2012) provided introjected motivation for those students to complete work inside and outside the classroom.

Students' attempts to compare scores after assessments was described in Box 5.12. The effort by students to compare scores (in my classroom) usually happened immediately as tests were being handed out. Marsh et al. (2012) found that use of primarily verification feedback tended to associate with increased competition between students. The effort students made in my classrooms to engage in this competition occurring so fast meant that it was not usually possible to introduce any feedback or 'feedforward'-focused tasks (Burns, Martin & Evans, 2021) before the competition began.

Box 6.1 - Competition following assessments in my classes

Considering the quantitative statistics, it was found that students' affinity towards target grade use only partially depended on their actual mean target grade, since this came back as statistically significant for year 11 in a single regression model, but not in the multiple regression and nor at any point for year 10. Further, students' relative autonomy indices were also never dependent on students' actual mean target grade. While these statistics do not share much in the way of competition or collaboration directly, these statistics *do* support the examples shared by students in that competition and varying levels of motivation occur across the spectrum of ability, or regardless of the set that students were placed into.

The previous chapter described Meg's and Bonnie's experiences relating to others' expectations of them, and their perceptions of those expectations. Earlier in this chapter, this was described in section 6.2, and again here one could consider that both students internalised the idea that they were seen as intelligent, and therefore experienced fear of letting others down. This introjected form of motivation may stem from strong values toward education (Baker & Barg, 2019) rooted in their discussion of schooling with parents. Perhaps, if Meg and Bonnie experienced pressure, in addition to the seemingly primarily self-imposed stress, this could be rooted in an authoritative parenting style (Spera, 2005), though neither student indicated that this was the case.

Joe's description of being "shouted at" (Year 10 Focus Group 1) or told off was not described by other students, though Stewie did indicate being pushed by his teachers to an extent he did not enjoy. This seemingly unique experience firstly demonstrated a lack of relatedness (Gagné & Deci, 2005), since no other participants related with Joe in this way. It is possible that Joe's case stemmed from boredom and amotivation. However, the behaviour he described, in addition to that described by teachers outside the formal data collection methods used in this study, associates with academic entitlement (Greenberger et al., 2008). Joe's account may imply that the uncivil behaviours he was exhibiting, such as interrupting the wider learning or being rude to teachers, stemmed from a perceived external locus of control. That is to say that Joe seemed to believe that his outcomes were dependent primarily *not* on his own work or effort. It is unclear whether his requests were not being met by teachers (Fromuth et al., 2019), though this would provide a logical explanation, or whether it was implicit *needs* Joe had that were not being met, failing to combat the amotivation he was experiencing.

Lastly, Stewie and Bonnie explained that they believed that students' differing work ethics necessarily meant that students could not experience relatedness with their peers, at least to a notable degree. Separately, Stewie and Peter extended this by including one's wider life experience here as a reason for lack of relatedness. Justifications for this included the sets students found themselves placed in due to a difference in in-class experience, as well as the socioeconomic position of different students. Kuhfield et al. (2020) described potential socioeconomic class gaps in the context of the pandemic, considering the disparity in technology availability; it is likely that in the same way, socioeconomic class affected the

wider resources that students had available, and affecting students' educational experiences. Given the potentially varied experiences and socioeconomic capital students brought to their education, it is possible that students engaging in competition with their peers may be starting at a disadvantage, though collaboration between peers is still likely to be supportive (Bureau et al., 2022) for those students.

This section discussed their experiences of collaboration and competition within peer groups and within class groups (sets) and the ways in which this affected their motivation. Some students benefited from the comparison of scores or grades with peers whereas some benefited from working with others to provide each other academic support. Other students described feeling pressure to conform or disengage, based on external pressures or wanting to fit in with peers, reflecting introjected motivation. In all these examples, students were describing their experiences, or lack of experiences, of relatedness. This strand of SDT was mentioned less frequently throughout the focus groups compared to autonomy or competence, appearing less important to students for their motivation. Having said that, the discussions of relatedness in the focus groups did highlight that social dynamics contributed to students' motivation in in varying, often complex, ways.

6.6 Factors hindering progress and success

Considering factors that may hinder a student's progress or later academic success depends on their experiences and practices both inside and outside the classroom, in addition to the teaching methods used. The topics discussed in this section come from both section **Error! Reference source not found.** and section 5.7, considering students' lives beyond the classroom too. Some factors that fall into this category have been discussed previously in this chapter, such as students' workload and their time management. The potential impacts of the Covid-19 pandemic are also discussed in more detail here.

In addition to the discussion earlier about students' experiences of lacking autonomy through both an inability to plan and manage their time efficiently such that they can complete all of the work set by their teachers (as described by Heidi, Eric, Kyle and Stan), as well as the high workload also described by Stan, students demonstrated their lack of autonomy and a preference to introduce autonomy. In addition to this was a description that students were keen to avoid sanctions (e.g. Stewie), exhibiting external motivation. This was extended by Brian's admission that he felt guilty when he did not do more work, an example of introjected motivation, whether that was homework effort or revision. These examples again demonstrated that students felt a desire at some level to meet the expectations of their teachers, and this guilt acted as an additional controlled motivator. The idea of students building more autonomy where possible (Ryan & Connell, 1989; Gagné & Deci, 2005) has been well-covered at this point, but the effort to avoid sanctions associates with Koenka et al.'s (2021) findings that students in this scenario tended to put in effort primarily as a "means to an end" (p. 935) and not for the interest, supporting the extrinsic and controlled motivation described here. Additionally, students' guilt indicates a desire to conform to and attempt to meet teachers' expectations. It is possible that this additional control and higher expectations from teachers may lead to the lower effort described by Wu et al. (2024), and again aligns with Koenka et al.'s (2021) description of controlled motivation. Conversely, this may demonstrate an example of interpreting an appeal to fear as a challenge to be met (Putwain, Remedios & Symes, 2015), somewhat supporting students' *autonomous* motivation.

On a similar line of thought, Peter and Stewie's descriptions of a lack of autonomy in revision method choice indicated that they believed they know their own competence levels and academic needs in more detail (for example, the specifics of what aspects of a curriculum

they needed to improve their knowledge in) than their teachers. These arguments again indicated that the autonomy they had was important, but that their ability to focus on their own competence in a given topic or subject was perhaps *more* important, aligning with Bureau et al. (2022).

The primary factor students discussed when considering hindrances to their academic progress or outcomes was the Covid-19 pandemic. Meg and Bonnie described the gaps in knowledge created by virtue of not having been in school for months, missing “foundational” knowledge (Bonnie, Year 10 Focus Group 2). This time out of school proved a hindrance to competence building (Schwartz et al., 2021), which as discussed was far more important than students acknowledged at the end of each focus group in the sorting tasks (Bureau et al., 2022). These gaps may reasonably have been exacerbated by the reductions in concentration and effects on general health described by Reuter, Forster and Kruger (2021). Additionally, the reduction in student ability to socialise (Van Lancker & Parolin, 2020) likely hindered students’ relatedness through their reduced time working collaboratively. Additionally, in line with Wendy’s comments, issues around resource availability for students may additionally have been exacerbated (Kuhfield et al., 2020) further hindering students. These factors together help to explain the frustration that Meg and Bonnie expressed when describing their efforts to attempt to ‘catch up’ and plug their own knowledge gaps. Given that Meg and Bonnie both exhibited elements of identified motivation, the gaps in their knowledge may have been smaller than that of others (Combette et al., 2021) given they likely engaged in their work more consistently than those experiencing primarily controlled motivation types, or amotivation.

There may also be other factors that, while not hindering a student’s progress or outcomes, are unlikely to be helping either. One such example may be the culture that is fostered inside a classroom and around a school as a whole. Where schools may lack features of a strong culture such as primary focus on learning environment (MacNeil, Prater & Busch, 2009) or building relatedness through collaboration (Lynch, Lerner & Leventhal, 2013), academic outcomes of students may not be able to improve as much as the school may want for their students, or for their league table positions (Dearden & Vignoles, 2011; Chitty, 2009).

The various foci of the school including improvement of homework provision, consistent focus on 'learning and teaching' (i.e. pedagogy) and the regular opportunities taken to reinforce the norms and values of the school means that this school is not lacking features of a strong culture. Comments from students throughout the focus groups support this, though there are odd examples where individual teachers may not be reinforcing or supporting the culture to the same extent as others. For an example of this, see Stan's comment relating to inconsistent homework setting by teachers.

Box 6.2 - Professional development and school culture at the study school

Additionally, it is possible that the use of target grades does not support students' outcomes, even if they are usually unlikely to *hinder* motivation or outcomes. Students' autonomous motivation levels (according to the RAI values) did not depend on their mean target grades. This, combined with the lack of correlation between these two variables, indicate that the use of target grades does not predict or associate with autonomous motivation. Given that autonomous motivation does associate with academic outcomes (Howard et al., 2021), one could infer, albeit perhaps loosely, that target grade use here has no effect on student outcomes. The meta-analysis by de Boer, Timmermans and van der Werf (2018) examining teacher expectation interventions and students' academic outcomes concluded, in part, that the effect size of teacher expectations on outcomes was small and inconsistent. Where target grades are used by teachers as a justification for the high or low expectations they have of students, this would suggest there is a small chance that students meet those expectations, and develop a self-fulfilling prophecy (Rosenthal & Jacobson, 1968; Jussim & Harber, 2005). As a result, the way that teachers frame target grade use may be of some importance here given the potential to support or hinder a student's academic success.

In the case where teachers may have been using target grades as a justification for sanctions or re-sitting assessments rather than as a method of encouragement, this may have reduced the effectiveness of students' relationships with their teachers (Smith et al., 2018), which could in turn have damaged students' engagement, and autonomous motivation, in lessons (Xiang et al., 2017; Martin & Collie, 2019) therefore potentially hindering academic progress. Experiences such as these where students may not have had as productive relationships with their teachers were described by students across all four focus groups. Where a student's mental health was then consequently also damaged from stress or

pressure (for example, see comments from Meg in subsection 5.9.3) due to the potential for additional work (through re-sitting assessments), this may have introduced the effects described by Garside et al. (2021) whereby students perform less academically well, which leads to further mental health suffering, introducing a cycle.

In all, it is clear that the students' various descriptions of their experiences inside and outside the classroom highlight several ways in which their progress or outcomes may be hindered. Considering the aforementioned lack of autonomy in their academic decisions regarding both homework and revision, and to a larger degree, the Covid-19 pandemic, have all created hindrances to students' abilities to make the academic progress and build competence across subject as they would like, again reiterating the importance of competence building in the view of the students. Through this, students showed several examples of introjected motivation (Ryan & Connell, 1989; Koenka et al., 2021), though their awareness of these issues and in some cases, their attempts to combat these, also demonstrate identified motivation too.

6.7 Change Over Time

As discussed in both chapters 4 and 5, there were very few changes that became evident through the year, regardless of the specific topic or statistic being examined within the study. This largely applies to both the qualitative and quantitative data collected. In the case of the data collected from the focus groups, some topics were highlighted as appearing only at the beginning or the end of the year, though this does not necessarily represent *change*, but rather *difference* in perspectives.

The lack of statistically significant change in any quantitative variable from the beginning to the end of the year would support that there was a steadiness in perspective on average. The single change in RAI values in-year for year 10, and the single change in-year in TGAi for year 11, were found to be the only statistically significant changes here. The subsequent change in the opposite direction, represented by negative *t*-values, and lack of change overall again supports relative consistency through the year. The same conclusion largely holds for the students' motivation types, since the beginning-to-end changes were consistently found not to be statistically significant. Given that *t*-tests and Stuart Maxwell tests are both calculated pairwise, one can be additionally confident that there was relatively little change through the year in the measures these tests were applied to, including the TGAi. The lack of statistically significant change in TGAi may perhaps be the most important; the consistency of these values mean that the use of target grades did not become more or less important for students through the year, but rather the alternative methods of self-motivation discussed in section 6.3 were likely distinctly more important in students' minds. The pair-wise calculation of this statistic means that each individual student necessarily did not experience a significant change in their motivation due to target grades as opposed to only the *mean* TGAi value staying constant across the sample of students. During the sorting tasks in the focus group, target grades were consistently ranked as one of the two least important factors affecting students' academic motivation.

Earlier in the year, more students described wanting to avoid missing their target grades. This may relate to either identified or introjected motivation (Gagné & Deci, 2005), depending on the student. Where a student recognised that their target grade may be a helpful benchmark to aim for, even if it was not their primary goal, would indicate identified motivation, representing a student's own (higher) expectations for themselves (Perry, Davies

& Qiu, 2018). However, the reference some students made to ‘fear’ of missing target grades, or the potential for embarrassment would associate more closely with introjected motivation, given that the student may be attempting more so to preserve their own identity and ego (deCharms, 1968; Gagné & Deci, 2005), again with a view to focus more so on others’ perceptions of their academic ability.

Conversely, the only topic mentioned at the end of the year by both year groups that was the effects of the Covid-19 pandemic. Reference to the pandemic exclusively in the second focus group for each year group suggests that students had an increased awareness of this, and this theme was discussed in more detail in the previous section. However, this does not align well with the near consistency of students’ motivation types (i.e. their identified motivation), since one may have expected students’ identified motivation to increase as they became more aware of, and motivated to, address the knowledge gaps described here.

To summarise, there were very few notable changes through the year from any of the data collected. Whilst none of the literature explicitly referred to changes over time, one could infer that the conclusions that much of the literature cited in this section (and this chapter) likely hold true regardless of which point of the academic year their data were collected at. The relatively consistent arguments put forward by students (with the few exceptions referred to in this section, and in section 5.8), and the steadiness of the statistics calculated, therefore also likely support that the perspectives of all of the student participants can be considered trustworthy.

6.8 Triangulation & Summary

6.8.1 Summary of triangulation

This chapter has not only allowed an opportunity to examine the ways in which the findings of this study relate to the existing literature, but also to highlight the ways in which the quantitative and qualitative findings relate to each other. This short section provides a summary of the triangulation that took place.

The measurement of students' TGAi (see section 4.2) through the year showed a general ambivalence toward the use of target grades. In the focus groups, students shared a range of both positive and negative perspectives on their use. The students' references to target grades as a helpful minimum benchmark to meet supports those who, when completing the SRQ-A, indicated some element of the identified motivation type. Others, however, with lower TGAi values may align with focus group contributions such as the attempts to avoid missing target grades for fear of embarrassment, or so that they meet their teachers' expectations of them. The latter introjected motivator, where it has been made known to students, may be related to the likelihood of students *meeting* those expectations, even if the increase in likelihood is small (Gregory & Huang, 2013; de Boer, Timmermans & van der Werf, 2018). In a few rare cases, students described finding enjoyment (and therefore intrinsic motivation) from interpreting their teachers' reference to target grades as a challenge, supporting the findings of Putwain, Remedios and Symes (2015) whereby perhaps students work to learn the material for the enjoyment of being challenged. Where target grades may stem from a statistically expected progression (i.e. by generating an *estimated* final grade) through key stages 3 and 4 (Leckie & Prior, 2022), it appears as though using those estimates as targets is not as helpful for students' academic autonomous motivation.

The mean RAI values found for students through the year being, on average, close to 0, as outlined in section 4.3, is also supportive of and supported by the qualitative findings. The few highly autonomously motivated students (according to the few high RAI scores) were represented by the uncommon references that students made to their enjoyment of learning about new concepts. Where the approximately normal distribution of the RAI scores meant that there was a concentration of students in the middle, these students' RAI values can be explained by focus group contributions that referred to controlling methods used by teachers mixed with those referring to ways in which students attempted to introduce their own

autonomy, make the most of relationships with others in various ways, or, most commonly, a desire to improve their own perceived competence. This ambivalence further supports the roughly even spread of students between identified motivation, and the more controlled motivation types (i.e. external and introjected motivation).

Finally, the largest proportion of students aligning with identified motivation consistently through the year aligns with the focus group contributions from students whereby they acknowledged, in a few cases, that target grades may be a useful minimum benchmark, and more commonly that other metrics for measuring the improvement of their perceived competence would be beneficial for meeting their own academic goals, such as further or higher education. The references by several students to sanctions for incomplete work or for missing their target grades explain why there was also a notable portion of students aligned primarily with external motivation. Finally, the third-most common motivation type being introjected aligns with the frequency with which students in focus groups mentioned attempts to meet the expectations of their teachers, avoid embarrassment or ‘keep up’ with their peers, all implying an effort to maintain their ego to some extent.

6.8.2 Summary

In all, the themes discussed in this chapter, based on the findings from the RAI and TGAI measures and their qualitative contributions, can all in some way be attributed to students’ psychological needs for academic motivation (i.e. autonomy, competence and relatedness), and those contributions help to contextualise the differing motivation types students aligned with given the characteristics of those motivation types. The students’ responses in the focus groups in combination with the quantitative data collected, it became clear that students experienced a lack of autonomy in their academic decision-making, though one could find it reassuring to notice the various ways in which students attempted to build in their own autonomy. In the two early focus groups, students ranked competence as unimportant for their academic motivation, however the later year 10 focus group identified that competence was more important than previously thought, aligning more closely with the frequent, and often indirect, reference to the concept throughout the focus groups. Finally, the less common references to shared or opposing experiences supported other findings (e.g. Bureau et al., 2021) that relatedness is the least important of the three factors of SDT, though this is not to say that relatedness is *unimportant*. There were some examples of relatedness

evident through students' descriptions of the experiences of setting, peer collaboration and in-class competition.

Aligning with the quantitative data, the focus group responses from students made clear the prevalence of identified motivation among students. There was of course also evidence of introjected and external motivation, and amotivation too. Beyond Stewie's comment relating to natural curiosity, there was little evidence of intrinsic motivation, again aligning with the quantitative data. Despite a small number of students aligning equally with more than one motivation type, the majority of participating students aligned with one motivation type each time, and the motivation type of these students did not (statistically) significantly change through the year. Further, where there were ties, these were usually between two motivation types adjacent to each other on the motivation type scale by Gagné and Deci (2005) shown in the Literature Review. The most common exception to this, the identified-external tie, was discussed in more detail earlier.

Several themes became clear through analysis. The most prevalent of these was the pragmatic perspective students exhibited in line with multiple concepts discussed in this chapter. These included students' efforts to determine their own practical goals as motivation, looking for efficiency of outcomes and, to a lesser extent, making use of teachers' feedback, aligning with Koenka et al.'s (2021) idea that students see work primarily as a means to an end. Further, there was evidence of pragmatism through a desire to balance workload and build an ability to manage time effectively with the goal to complete all work set as well as protect mental health. Finally, students acknowledged that in some cases, authoritative teaching methods are helpful for their academic progress, and so in some scenarios therefore indicated that their lack of autonomy was acceptable since it would be helpful for them in the longer term. The ways in which teachers interacted with students regarding the use of target grades varied; where teachers framed this in an encouraging way (Perry, Davis & Qiu, 2018), students may have built a more positive view of target grade use. Where these are generated using prior attainment, these are helpful for giving a statistical expectancy for what students could achieve in their GCSEs (Leckie & Prior, 2022), all else being equal, given that prior attainment is widely considered an important predictor of outcomes.

In contrast to the pragmatic balance students attempted to find in their academic work, there was some tension between the structure students appreciated and the efficiency

with which they could build their competence against the autonomy they experienced inside and outside the classroom. This was shown through the pressure experienced potentially related to the marketisation of education (Tomlinson, 2001; Chitty, 2009) and controlled motivation methods used in school (Gillborn & Youdell, 2000) against the relationships teachers and students built with each other (Quin, 2017), and the other efforts students went to to introduce their own autonomy. This pressure may have been applied in part by the use of fear appeals (Putwain & Symes, 2011a; Putwain, Remedios & Symes, 2015) and damaging students' perceptions of their competence, though in some cases may have encouraged students to build their own mastery-focused goals for their achievement at GCSE.

With these data largely in agreement with the existing literature surrounding motivation theory and students' experiences in school in general, and the knowledge of the overarching themes and perspectives provided by students across the focus groups and the psychometric testing questionnaire, brief conclusions are drawn in the next and final section of this chapter, before overall conclusions in the next chapter.

6.9 Conclusion

Before addressing the research questions from the Literature Review directly in the next chapter, some key conclusions from this chapter are drawn here, considering the triangulation and consistency of data, including where there is strength and nuance in the findings. This chapter has addressed various themes, including students perspectives on target grade use, the alternative benchmarks students used to motivate themselves, and how their autonomy, perceptions of their own competence and their relatedness to others aligned with themes such as introducing more autonomy, pragmatic decisions about their future and how best to motivate themselves, among others. The alignment of the data collected with the literature has demonstrated the little impact that target grades had on students on average, with some nuance when considering those with stronger views on target grade use, both positive and negative.

When considering the extent to which the data triangulate together, the range of perspectives put forward by students regarding the use of target grades by their teachers, and the general sentiment that they were not worth putting significant mental stock into aligned with the very small TGA1 values throughout the study, indicate a relatively consistent ambivalence toward target grades on average. Despite this, early in the year there was an indication that they may be helpful as a minimum expectation to avoid missing, and this aligned with the controlled motivation that students experienced most commonly, further associating with the negative (albeit very small) RAI values throughout the year. In all these examples, consistency of data here supports the trustworthiness that was aimed for through the methods used for the study during the design phase. The range (and to an extent, the proportions) of each motivation type that the students described during the focus groups corroborated the proportions of each motivation type for the wider samples in each year group discerned from the SRQ-A data, again supporting trustworthiness.

While the data do triangulate and generally align well, there is some nuance to be found here too. For example, the ties in motivation type for some students aligns with the examples in the focus groups of individual students exhibiting examples of more than one motivation type. Despite not being the most common tie combination, perhaps the most surprising combination of motivation types was the identified-external tie. A potential explanation for this could be found from comments from Peter and Glenn, and to a lesser

extent Stewie, describing that they completed work set by their teachers primarily to avoid sanctions (of any form discussed previously), while also recognising that completion of that work would be beneficial for their academic progress and competence.

Further nuance may be appropriate when considering the ambivalence toward target grades explained earlier. The very small mean TGAI values and spread of perspectives from the focus groups does support this, though it is important not to lose the fact that there was still a notable range of TGAI values collected from all of the participating students. Additionally, while the qualitative perspectives provided could 'average' to ambivalence, they also demonstrated some strength of (primarily negative) feeling toward target grade use, conflicting with the rare suggestion that targets may be effective as a minimum benchmark. It may be important for teachers to consider how target grades are framed to students, as to encourage a positive self-fulfilling prophecy (Rosenthal & Jacobson, 1968) improvement loop, even if the likelihood of this loop developing is small. Additionally, while the TGAI and RAI values both demonstrated no statistically significant change from the beginning to the end of the year, the *t*-values associated with in-year changes do suggest that there was movement in these perspectives, with a corresponding reverse movement later. Regarding nuance around students' perspectives on target grade use, the more common view that predicted grades may be more helpful conflicts with the potential bias introduced where teachers used target grades as a guide for determining predicted grades, perhaps making them just as unreliable as the target grades themselves (in the view of students, perhaps unbeknownst to them), even if there is a statistical justification for target grade generation for school efficacy measurement (Leckie & Prior, 2022).

The pragmatic view students took to the use of sanctions ought to be reiterated; clearly, students were trying to avoid being sanctioned for not performing to their target grade, but the acceptance some students held towards these sanctions for the sake of pragmatism is important. This reinforces that the context and delivery of these sanctions, as described by Heidi and Wendy (among others to a lesser extent), has a significant effect on the students' perceptions of these. It is important to consider these examples of where nuance is appropriate and necessary in the findings, though this does not take away from the larger consistency of data described earlier in this section, nor the trustworthiness of the findings discussed in this chapter.

Finally, beyond the explicit guidance students in focus groups were presented with to address the issue of target grade use in line with the research questions for this study, a number of the other themes discussed here relate to target grade use. In some cases, the link was made explicitly by students, but this was not always the case. One such example of this was students' discussion around their lack of autonomy whereby the workload assigned by teachers may stem from their efforts to push students to meet their target grades, or guide them toward sanctioning students who missed target grades. Additionally, the students' acceptance of structure and an authoritarian approach to their education was accepted when they could see that the targets applied to them aligned with their own personal goals. Considering the competition between peers in-class briefly mentioned earlier, it may be the case that the stakes for students who compete with their peers are higher where meeting or missing the target plays a role in who 'wins' when receiving marked tests back and comparing scores and grades. Where Meg and Bonnie described their awareness of knowledge gaps resulting from the pandemic, the frustration teachers experienced due to these gaps, as described during the second year 10 focus group, may also be rooted in the teachers' mindfulness that they are looking to ensure as many students as possible meet the target grades that they were issued. Finally, students may also be subconsciously aware of their target grades when feeling guilty for not working as hard as they believed they should have been. In all these examples, the use of target grades and perhaps teachers' and students' awareness of them, symbolise the extrinsic and controlled motivation methods that are employed not only by the study school but far beyond.

Having considered the wide-ranging impacts of target grades beyond their explicit use according to the students receiving the target grades, the next and final chapter makes use of this chapter and its precedents to directly address the three research questions posed in section 2.7 in the Literature Review to draw final conclusions for this thesis. Additionally, some limitations of this study and recommendations for future work in this area are also discussed.

7 Conclusions

This thesis, following a justification for the study and a review of the literature relevant to the motivation of students and the use of self-determination theory as a framework, explained the mixed-methods design used to investigate the extent to which target grades are effective as an extrinsic motivational tool. Based on the findings detailed in chapters 4 and 5, and the subsequent discussion of these in relation to the literature in the Discussion, final conclusions are drawn in this chapter. Following these final conclusions, directly addressing the three research questions, is consideration of the limitations of this study, and recommendations both for future research in this area as well as for schools that may continue to make use of target grades, as described in the Introduction.

7.1 Addressing the Research Questions

The first of the three research questions considered the extent to which students perceived the use of target grades as motivational. Themes around this question were discussed primarily in section 6.2 and section 6.3, though the concept of target grades and their motivational effects did appear in other sections in chapter 6 too. The spread of quantitative data, primarily considering the TGAI measure, combined with the range of perspectives shared by students demonstrating an on-average ambivalence towards target grades, though there were students that had notable negative feelings towards their use. This contrasted with the rare admissions that some students considered these to be more like a minimum expected grade, introducing controlled motivation for some students. Despite the statistical justification for identifying which grades students are estimated to finish their GCSEs with (Leckie & Prior, 2022), the experiences that students shared about the *use* of target grades in the classroom was varied and often not supportive for students' academic motivation.

The second research question considered the motivation type(s) that students experienced and their perceptions of target grades, and so these were investigated. The modal motivation type being identified motivation, though not representing the majority of students, indicates that students largely recognise the benefits of completing academic work. This may align with some perspectives outlined during the focus groups that students viewed

target grades as a helpful minimum benchmark to achieve. However, the majority of students experienced controlled motivation types, primarily external motivation. Alternative perspectives from the focus groups indicated that more students did not find their target grades helpful, opting to choose other benchmarks to aim for, originating from students' varied logic, pragmatism and aspirations for the future. The albeit weak dependence of students' target grade affinity, as per the TGAi measure, on their relative autonomy index (RAi) suggests that as a student's autonomous motivation increases, their target grade affinity increases marginally. The statistically significant linear regression model denoting this dependence, with $p < .001$ for each year group, may be more nuanced given that the students describing target grades as helpful as a minimum benchmark also sometimes indicated other goals they aimed for instead. Overall, a student's motivation types may align loosely with their perspectives on target grade use, though there are scenarios where this is not the case.

The third and final research question considered whether students' motivation types or their perceptions of target grade use changed through the year. This question was addressed by considering differences in points made by students through the focus groups, as well as statistical tests using the quantitative data collected through the year. While two models, incorporating differing random seeds for tie-breaking where motivation type ties occurred, indicated either one or two in-year changes, the third indicated no change. In all three models, there were no statistically significant changes from the beginning to the end of the year, indicating a lack of overall change in student motivation types. Both RAI and TGAi did show a single statistically significant change in-year, however the change in the opposite direction and lack of statistically significant change from the beginning to the end of the year again supported that there were no important changes regarding these measures either. In all, it would be reasonable to conclude that while some individual students may have changed their perspectives marginally, there were no overall changes in any of these measures, supporting that the students' perspectives remained consistent through the academic year.

These conclusions can be considered trustworthy, despite the limitations displayed in the next section below, for a number of reasons. Considering the quantitative data, observing visualisations of distributions of RAI and TGAi values and the small values for skew and excess kurtosis support that the statistical tests conducted are still appropriate. Additionally, the use

of Chi-square tests to examine the statistically significant difference between tie-breaking methods (finding none), increase confidence in the proportions of students associated with each motivation type. Regarding the qualitative data collected, the use of 'critical friends' through the supervision process confirmed that the analysis of these qualitative data was robust, and the representation of students' perspectives were fair and accurate. Triangulation of these data in the Discussion showed that they aligned well, with the qualitative data often providing context and helping to explain the quantitative data. Consideration of where nuance may be appropriate for these conclusions, along with other limitations, are outlined in the next section.

7.2 Limitations

No research can ever be conducted ‘perfectly’, if such a concept exists. As described in the Methods chapter, there were changes made during the analysis and writing stages of this research. The limitations of this project and its conclusions are outlined here. Proposals for addressing the issues discussed here are given in section 7.4 below.

The first limitation relates to the use of the Relative Autonomy Index (RAI). This measure is helpful for assessing how autonomously motivated students are (Howard et al., 2020), and supports building a wider picture about students’ motivation. For example, this is helpful for considering how students’ autonomous motivation levels relate to their affinity for target grade use, calculated through the Target Grade Affinity Index, TGAI. However, the motivation types that students may fall into (de Bilde, Vansteenkiste & Lens, 2011) do not neatly align with given ranges of RAI values. This means that the RAI cannot be accurately used to identify the motivation type a student most closely aligns with. Since this was not attempted, there is no effect on the findings or conclusions drawn, however it may be important to consider that two students with the same RAI values could also associate most closely with two different motivation types.

Another limitation with the quantitative data lies in the values calculated for skew and excess kurtosis. As discussed early in chapter 4, the statistically significant values for skew and excess kurtosis indicate non-normality, showing that distributions of both mean RAI values and mean TGAI values for each year group were mildly leptokurtic, and mildly positively skewed, indicating a smaller number of students with higher scores for RAI or TGAI. Previous seminal methods-focused literature (e.g. see Cohen, Manion & Morrison, 2018) supports that the values found were not enough to warrant the use of non-parametric statistical tests, though it would be remiss to ignore the statistically significant values for both of these measures. Given the approximately normal distribution (visually), and the W value being so close to 1 from the Shapiro-Wilk test, confidence that these findings are still trustworthy is reasonable.

Thirdly, the SRQ-A psychometric test for academic motivation is a self-report test. Students were required to indicate their level of agreement with 25 items (as seen in Appendix B – Data Collection Tools). One could argue that the students know best what

motivates (or does not motivate) them. However, there is the opportunity here for small discrepancies to appear in the data. For example, the 3% of students who resulted in a five-way tie between different motivation types may have not paid enough attention to the statements they responded to (for example by choosing '3' on the Likert scale for all statements). Alternatively, a student's responses may have varied slightly had they completed the assessment on a different day. The first of these issues can be considered mitigated by the large sample of students who participated in earnest being sorted into a single motivation type. The second of these issues is not considered an important limitation since the dates of data collection were chosen deliberately to be as soon as possible after progress reports showing students' attainment and a comparison to their target grades.

Finally, and perhaps most notably, the Methods chapter described the addition of Chi-square tests (Franke, Ho & Christie, 2012) in support of solving the problem faced around students most associating equally with more than one motivation type, and it may have been helpful to have considered this possibility in advance of commencing data collection such that a plan could be put in place beforehand. This issue was mitigated by the use of multiple different tie-breaking methods, including the use of multiple random seeds for the distribution of students between motivation types where they were tied. The Chi Square tests conducted to determine the statistically significant difference between the proportions of students associated with each motivation type after these tie-breaking method tests firstly showed that, at two of the three points in the year, even forcing students toward the most or least autonomous form of motivation did not yield a significant difference in proportions of students in each motivation type. When the same test was conducted with only the three different random seeds, the $p > 0.997$ at all three data collection points supports that the distributions of students can still be considered trustworthy for the sake of drawing conclusions.

7.3 Recommendations for Future Research

Given the limitations of this study described above, there are multiple recommendations for future research in this area. These include adaptations to methodology, as well as to the scale and scope of potential study.

Methodologically, it would have been helpful to have pre-emptively considered the nuance around students' motivation types. Beyond preparing for the potential for ties between motivation types as described in Methods (with results in chapter 4), the various combinations of motivation types students experienced, including non-ties, means that considering generating clusters of students beyond single motivation type categories (i.e. creating student academic motivation profiles) may have been helpful, even if those profiles were based on the motivation types as defined. This would not only show various combinations and thereby account for the nuance students may have demonstrated, but also increases the flexibility of the scale visualised by Gagné and Deci (2005). Further, despite there being no evidence of motivation type ties in other literature where the same methods and data collection tools were used (for example see Vansteenkiste et al., 2009), it is unlikely that no students associated with more than one motivation type; it is unclear whether these other studies used tie-breaking methods that were undisclosed. Additionally, the addition of some tie-breaking statements for students may have further supported the distribution of students between motivation types. These could have taken the form of comparative statements using language from two adjacent motivation types, though this would require further validation and testing before use for drawing conclusions en masse.

Otherwise, a longer lasting study that covered the full two-year GCSE course may have been helpful for assessing whether perspectives changed not only in-year, but within a single sample (i.e. year group) over the course of the whole qualification. Use of appropriate statistical tests here, in addition to the *t*-test, may have shed more light on student perspectives. One could also increase the number of data collection points in each year of the study, though in *this* study, these data collection points were planned to occur shortly after students had received their progress reports.

Inclusion of a larger number of schools that also use target grades with their GCSE students may have been helpful. The advantages of this would include results from a larger

sample therefore potentially covering more demographical groups of students, including socioeconomic or groups with other markers such as English as an Additional Language, Special Educational Needs, or Pupil Premium. Further, this could also include schools with different attainment profiles, for example schools with *negative* Progress 8 scores, or perhaps just *lower* scores. This increase in sample would not only improve the extent to which the data are normally distributed (or perhaps confirm that the data in fact are *not* normally distributed, though this is unlikely), but also indicate the extent to which the findings and conclusions drawn in this thesis can be applied to other schools, or across a range of subjects.

7.4 Recommendations for Schools Using Target Grades

Given the arguments raised in the Discussion, and the final conclusions addressing the research questions in section 7.1, there are several recommendations that schools that engage in target grade use may find helpful when considering *how* to implement their use. These recommendations are given here.

It became clear that students at the study school experienced a lack of autonomy in various ways, and made efforts to introduce their own autonomy where possible. This was largely, though not entirely, focused on benchmarks students chose to aim to meet by the end of their GCSE courses. In this way, schools may see benefits from increasing the level of autonomy that students are afforded when making decisions about benchmarks to achieve. This could include students identifying entry requirements for courses of further study they *may* want to take, and using these as benchmarks, or choosing higher grades than that should they so wish. This may be impractical with some students whose autonomous motivation levels are low, creating the argument that controlling motivators are necessary, though the specifics of this potential debate (e.g. see Gillborn & Youdell, 2000) are beyond the scope of this thesis.

The above recommendation is supported by the discussion from the Discussion about target grades being helpful for a few students, and actively demoralising for others. Firstly, where a supposedly motivational tool is actively demoralising students, one could question whether the practice is ethical at all, especially where teachers are not being as careful as they perhaps should be in their use of fear appeals (Putwain & Symes, 2011a). It may be the

case that target grades should primarily be for teachers' use without students' knowledge, or perhaps they simply be removed from student progress reports that are sent to parents. This leads to the suggestion above regarding the most appropriate benchmarks for students to aim for, and whether they should have a say in those benchmarks at all.

The point made in the previous paragraph can be extended to the arguments in several chapters that the way target grades are framed by teachers with their students, and the encouraging (or not) language teachers use (Smith et al., 2018; Quin, 2017). Where schools choose to continue use of target grades that are calculated using models based on prior attainment, school attended and potentially other socioeconomic factors, one could argue that it is imperative that they are used as a method of encouragement for students to improve their competence, rather than an excuse to introduce sanctions for students not meeting those targets. Where target grades are truly aspirational but still achievable from the perspective of the student, target grades may be useful in helping some students develop positive improvement loops (in line with Rosenthal & Jacobson's (1968) self-fulfilling prophecy theory and study), even if this is seldom a successful motivational method (Brophy, 1983). Conversely, where target grades are perceived as lower by students or teachers, teachers could exercise caution to not introduce a *negative* self-fulfilling prophecy, where a student interprets a low expectation of outcomes from their teacher, leading to worsened academic outcomes, damaging the teacher's expectations, and so on.

Finally, schools having high aspirations for the results they would like their students to earn by the end of their GCSEs would seldom be argued as a negative for students or the school alike, especially when this is incorporated with a culture focused on academic progress and enjoyment of learning (MacNeil, Prater & Busch, 2009). However, as Michael (February 2023) suggested, where aspiration is provided for the students and those students in turn do not build their own autonomous motivation for learning, building on any natural curiosity (Stewie, Year 10 Focus Group 2), students being pushed to reach seemingly arbitrary benchmarks may be damaging to their self-esteem, their mental health, or both.

8 References

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9 Appendix A – Participant Information Sheets

*Note that the following aspects of the Participant Information Sheets have **not** been copied into this appendix: header, footer, formatting*

A1 Student Participant Information Sheet

Participant Information Sheet for Parents of Year 10 & 11 Student Participants

Name of department: School of Education

Title of the study: Students' Experiences of Target Grade Use as an Extrinsic Motivational Tool

Introduction

In this study, the researcher (Alexander Odeneal, a doctoral student at the University of Strathclyde) is investigating the extent to which a Year 10-11 student is motivated by the use of target grades.

If you would like to talk about the study, including for further information or to ask questions, you can get in contact via: alexander.odeneal@strath.ac.uk or aodeneal@salesian.surrey.sch.uk

What is the purpose of this research?

There are two main aims of this study. The first of these is to determine the extent to which students are motivated by their target grades, and whether this motivation is autonomous (i.e. they have chosen to try to meet the target because they feel capable, and are interested in the subjects), or controlled (i.e. they are pushed to meet the target grade, for example, 'because they feel like they have to'). The second aim is to determine whether these perceptions hold over the course of an academic year, or whether they vary.

Do the students have to take part?

The research will be conducted during the school day, simultaneously across each whole year group. Whilst students are encouraged to participate, it is entirely down to you (as parents/guardians) and the student, whether they wish to complete the tasks set. Students who do not wish to participate will not be forced to do so, and will be given a separate task to complete (in lieu of the questionnaire).

Should students decide not to take part, or to withdraw their consent part way through the study, they are able to do so at any point (until all data has finished being collected, on May 31st, 2023). Students who do not participate will not be treated any differently from those who do participate.

What will the students do in the project?

All students (whose consent is not withdrawn) will take part in responding to a questionnaire at three points in the year (in around September, March and June). This will aim to determine the extent to which students are motivated to study, and measure the type of motivation

they experience. It will ask them to rank their level agreement on a scale of 1-4, for 25 statements relating to potential reasons to be motivated, including the use of target grades.

Based on these responses, a few students will be selected to participate in focus groups over the course of the year (each one within two weeks of completing the questionnaire). In these focus groups, the students will be asked to elaborate on the reasons that they chose the rankings that they did, and to openly discuss their academic motivation.

All of these activities will take place on-site, and during the school day. Whilst the study as a whole will occur over the course of the 2022-2023 academic year, each questionnaire will take less than 10 minutes, and each focus group (if selected) will be limited to one school period (i.e. 50 minutes).

Why have these students been invited to take part?

Since the study aims to look at the use of target grades as a motivational tool, it makes sense to consider the perceptions of students throughout Key Stage 4, since this is when they first receive their target grades, and when their teachers (may) use them. All students in Years 10 and 11 are eligible for participation, and will be invited to participate (unless consent is withdrawn). The students selected for the focus groups will be deliberately chosen to represent a variety of views on the use of target grades, and academic motivation.

What information is being collected in the project?

Whilst students complete the questionnaire, their name will be recorded. Following each questionnaire, the data will be anonymised, identified only using a unique code – this will help the researcher to identify any patterns that appear in the data throughout the year.

The focus groups will be audio recorded for the sole purpose of transcription. During the focus groups, students' names will be used so that I can match the views expressed to the responses from the questionnaire. The students' names will be removed during the transcribing process, to be replaced by the same unique code mentioned before. Once transcribed, the audio recording will be destroyed.

At the end of the data collection period, on May 31st, 2023, all remaining identifying information will be destroyed.

Who will have access to the information?

The information that is collected during the study will be accessible only by the researcher, and the two supervisors overseeing the researcher. Immediately following the end of data collection (on May 31st, 2023), any identifying information will be destroyed – all data collected will have been anonymised by this point.

In the event that a student discloses information relating to serious or imminent danger to themselves or others, then this information will be passed on through the relevant safeguarding process, as detailed in the Safeguarding Policy at Salesian School, Chertsey.

Where will the information be stored and how long will it be kept for?

The data will be stored on the secure, password-protected servers at the University of Strathclyde. The document matching identifying information to the unique codes will be stored completely separately.

The identifying information will be destroyed following the end of the data collection phase on May 31st, 2023. The anonymised information will be kept indefinitely so that further analysis may take place beyond the scope of this particular study. This anonymised data will still be stored securely.

Thank you for reading this information – please ask any questions if you are unsure about what is written here.

All personal data will be processed in accordance with data protection legislation. Please read our Privacy Notice for Research Participants for more information about your rights under the legislation.

What happens next?

If you would NOT like your child to participate in this study, please click the link below to the Microsoft Form and enter your child's full name and year group.

[Link to Microsoft Form – please click here to withdraw consent](#)

You may withdraw consent at any point until May 31st, 2023. If the withdrawal of consent happens after the data collection has started, then your child will be excluded from further participation, and any previous data collected for your child will be destroyed.

Once the study is completed, the anonymised data will be analysed and published.

Researcher contact details:

Alexander Odeneal (University: alexander.odeneal@strath.ac.uk; School: aodeneal@salesian.surrey.sch.uk) Chief Investigator details:

Prof David Kirk (david.kirk@strath.ac.uk, 141 St James Road, Glasgow, G4 0LT, 0141 444 8038)
Dr Dillon Landi (dillon.landi@strath.ac.uk, 141 St James Road, Glasgow, G4 0LT, 0141 444 8100)

This research was granted ethical approval by the School of Education Ethics Committee.

If you have any questions/concerns, during or after the research, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:

Secretary to the University Ethics Committee

Research & Knowledge Exchange Services

University of Strathclyde

Graham Hills Building

50 George Street

Glasgow

G1 1QE

Telephone: 0141 548 3707

Email: ethics@strath.ac.uk

[New page]

Consent Form for Student Participants in Years 10 and 11

Name of department: School of Education

Title of the study: Students' Experiences of Target Grade Use as an Extrinsic Motivational Tool

- I confirm that I have read and understood the Participant Information Sheet for the above project and the researcher has answered any queries to my satisfaction.
- I confirm that I have read and understood the Privacy Notice for Participants in Research Projects and understand how my personal information will be used and what will happen to it (i.e. how it will be stored and for how long).
- I understand that my child/ward's participation is voluntary and that I am free to withdraw them from the project at any time, up to the point of completion (on May 31st, 2023), without having to give a reason and without any consequences.
- I understand that I can request the withdrawal from the study of some personal information and that whenever possible researchers will comply with my request. This includes the following personal data:
 - o My child/ward's personal information from transcripts and from the questionnaire (all of which kept only until 31st May, 2023)
- I understand that anonymised data (i.e. data that does not identify my child/ward personally) cannot be withdrawn once they have been included in the study.
- I understand that any information recorded in the research will remain confidential and no information that identifies my child/ward will be made publicly available.
- I consent to my child/ward being a participant in the project.
- I consent to my child/ward being audio recorded as part of the project, if chosen for the focus group phase
- I understand that if I do not want my child/ward to participate in this study, then I must notify Alexander Odeneal (or another named researcher) at any point before May 31st, 2023, using the details given above.

A2 Teacher Participant Information Sheet

Participant Information Sheet for Teaching Staff

Name of department: School of Education

Title of the study: Students' Experiences of Target Grade Use as an Extrinsic Motivational Tool

Introduction

In this study, the researcher (Alexander Odeneal, a doctoral student at the University of Strathclyde) is investigating the extent to which a Year 10-11 student is motivated by the use of target grades.

If you would like to talk about the study, including for further information or to ask questions, you can get in contact via: alexander.odeneal@strath.ac.uk or aodeneal@salesian.surrey.sch.uk

What is the purpose of this research?

There are two main aims of this study. The first of these is to determine the extent to which students are motivated by their target grades, and whether this motivation is autonomous (i.e. they have chosen to try to meet the target because they feel capable, and are interested in the subjects), or controlled (i.e. they are pushed to meet the target grade, for example, 'because they feel like they have to'). The second aim is to determine whether these perceptions hold over the course of an academic year, or whether they vary.

Do you have to take part?

Participation is voluntary. There is no obligation to take part in the study if you do not wish to do so. Refusal to participate, or withdrawing participation during/following the interview, will not affect the way you are treated at all.

What will you do in the project?

Your participation will mean taking part in an informal interview in a one-on-one setting. Whilst I will have some specific questions to ask, the interview will be conversational in nature. These interviews will take part at some point in the 2022/2023 academic year, starting in mid-September 2022, depending on when the new Year 10 cohort is issued target grades. They will take place at school, during normal working hours, and are unlikely to take longer than 20-30 minutes.

Why have you been invited to take part?

All qualified teachers are eligible to take part. The teachers selected to take part will have been selected randomly from a list of teaching staff at Salesian School. This aims to represent a range of teachers' experiences within the school.

What information is being collected in the project?

Information about you as the participant, following anonymisation, will include your general area of experience (for example 'Senior Leader', 'Middle Leader' or 'Classroom Teacher' etc), but will not include your job title (since this could identify you).

The interview will ask you for your perception of the culture of the school in general, the culture of the school relating to academic achievement, what your perceptions are on the

motivation of students to study, your perceptions on the use of target grades in general as well as at the school, and then how you use target grades in your own classroom (if at all).

The interview will be audio recorded. Following the conclusion of the interviews, each one will be transcribed and anonymised, removing any identifying information. Once transcribed, the audio recording will be destroyed.

Who will have access to the information?

The information that is collected during the study will be accessible only by the researcher, and the two supervisors overseeing the researcher. All data will be anonymised during the interview transcription stage.

Should you disclose any information that indicates a reasonable possibility of danger to you or someone else, then this will be passed on through the relevant safeguarding channels.

Where will the information be stored and how long will it be kept for?

The data will be stored on the secure, password-protected servers at the University of Strathclyde.

The data collection phase ends on May 31st, 2023, and this will be the last day that consent for participation can be withdrawn. The anonymised information will be kept indefinitely so that further analysis may take place beyond the scope of this particular study. This anonymised data will still be stored securely.

Thank you for reading this information – please ask any questions if you are unsure about what is written here.

All personal data will be processed in accordance with data protection legislation. Please read our Privacy Notice for Research Participants for more information about your rights under the legislation.

What happens next?

You may withdraw consent at any point until May 31st, 2023. Once all interviews have taken place, transcription and anonymisation will happen. Once the study is completed, the data will be analysed and published.

Researcher contact details:

Alexander Odeneal (University: alexander.odeneal@strath.ac.uk; School: aodeneal@salesian.surrey.sch.uk)

Chief Investigator details:

Prof David Kirk (david.kirk@strath.ac.uk, 141 St James Road, Glasgow, G4 0LT, 0141 444 8038)

Dr Dillon Landi (dillon.landi@strath.ac.uk, 141 St James Road, Glasgow, G4 0LT, 0141 444 8100)

This research was granted ethical approval by the School of Education Ethics Committee.

If you have any questions/concerns, during or after the research, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:

Secretary to the University Ethics Committee

Research & Knowledge Exchange Services

University of Strathclyde

Graham Hills Building

50 George Street

Glasgow

G1 1QE

Telephone: 0141 548 3707 Email: ethics@strath.ac.uk

Consent Form for Qualified Teaching Staff

Name of department: School of Education

Title of the study: Students' Experiences of Target Grade Use as an Extrinsic Motivational Tool

- I confirm that I have read and understood the Participant Information Sheet for the above project and the researcher has answered any queries to my satisfaction.
- I confirm that I have read and understood the Privacy Notice for Participants in Research Projects and understand how my personal information will be used and what will happen to it (i.e. how it will be stored and for how long).
- I understand that my participation is voluntary and that I am free to withdraw from the project at any time, up to the point of completion, without having to give a reason and without any consequences.
- I understand that I can request the withdrawal from the study of some personal information and that whenever possible researchers will comply with my request. This includes the following personal data:
 - o Audio recordings of interviews that identify me (to be anonymised later)
- I understand that anonymised data (i.e. data that do not identify me personally) cannot be withdrawn once they have been included in the study.
- I understand that any information recorded in the research will remain confidential and no information that identifies me will be made publicly available.
- I consent to being a participant in the project.
- I consent to being audio recorded as part of the project (to be transcribed, anonymised and the recording destroyed later)
- I understand that if I do not want to participate in this study, then I must notify Alexander Odeneal (or another named researcher) at any point before May 31st, 2023, using the details given above.

10 Appendix B – Data Collection Tools

B1 Self-Regulation Questionnaire – Academic Items

Complete the sentence: Why are you studying in general? I am motivated to study...

External regulation (general) (code on data: E)

1. ...because I'm supposed to
2. ...because that's something others (parents, friends, teachers etc) force me to
3. ...because others (parents, friends, teachers etc) oblige me to
4. ...because that's what others (parents, friends, teachers etc) expect me to
5. ...because I'm supposed to meet my target grades

Introjected regulation (general) (code on data: N)

6. ...because I want others to think I'm smart/skilful
7. ...because I would feel guilty if I didn't
8. ...because I would feel ashamed if I didn't
9. ...because I want others to think I'm a good student
10. ...because I don't want to miss my target grades

Identified regulation (general) (code on data: D)

11. ...because I want to learn new things
12. ...because it is personally important to me
13. ...because this represents a meaningful choice to me
14. ...because this is an important life goal for me
15. ...because I want to meet my target grades

Intrinsic motivation (general) (code on data: I)

16. ...because I am highly interested in doing this
17. ...because I enjoy doing it
18. ...because it's fun

19. ...because it's an exciting thing to do
20. ...because I need to exceed my target grades

Amotivation (general) (code on data: A)

21. ...honestly, I don't know; I really feel that I am wasting my time in school
22. I don't see why I'm studying and, frankly, I couldn't care less
23. Once I had good reasons to study; however, now, I wonder why I should study
24. I don't know; I can't understand why I'm studying
25. I'm meant to aim for my target grade but this is pointless

Notes about the SRQ-A

- Statements appeared in a random order for each pupil.
- The statements numbered a multiple of 5 were added to reflect the aims of the study and validated by two pilot studies.

B2 Focus Group Planning Sheets

Focus group SEND NAMES OF STUDENTS TO [ATTENDANCE OFFICER] FOR REGISTRATION

Preamble 1

Thank you for participating in this study. Your parents have received an information sheet about the research that I'm conducting. In short, I am investigating the extent to which students in Years 10 and 11 find target grades motivational, what those students' perceptions of target grades are, and if those perceptions hold over time. If you'd like to read more about what I'm researching, you can either ask your parents for the sheet, or I can email it directly to you.

Last week, you all completed a questionnaire asking you to rank your level of agreement with a series of statements. That data shows the type of motivation that students experience, and I used the data to randomly select a student from each motivation type, leading to this particular group.

Today, we will conduct a focus group. In case you've not done this before, a focus group is a bit like being interviewed as a group, but it is more conversational in nature, and allows for time for discussion.

Memos to me

- Keep an eye on students that want to speak but can't / body language
- Are we keeping discussion on track?

Preamble	I have a series of statements and prompts that I'll show you, and you'll have a chance to discuss it with each other before we have a wider discussion as a group. For each one, please think about all your subjects whilst talking about it. Whilst we're having the smaller discussions, feel free to talk however you like. Whilst we're having the discussion together, please try not to speak over other people so that everyone has a chance to be heard. Please be reassured that if you have something to say, you will have the chance to say it. So that people feel they can be honest, please do keep anything that's shared in the group anonymous, and don't repeat it once we've finished. I won't pass on anything that you've said to anyone else at all (including other teachers or SLT), except in the case of someone being in danger. Does anyone have any questions before we begin?
P1	"I feel motivated to study" <i>Students have a discussion amongst themselves about the statement</i>
Q1	Do you feel motivated to study? If so, why?

	<i>Students answer the question - I make sure everyone has a chance to say what they need</i>
P2	"target grades" <i>Students have a discussion amongst themselves about what this prompt makes them think about</i>
Q2	How do you feel about your target grades? <i>Students answer the question</i>
P3	"How my teachers use my target grades..." <i>Students discuss what the prompt means for them</i>
Q3	How do your teachers use your target grades, if at all? <i>Students answer the question</i>
Q4	___% of students said in the questionnaire that they study because they're expected to. What do you think about this? <i>Students have a discussion amongst themselves then we'll bring it back to talk about it as a wider group</i>
P5	"I feel like I have autonomy in my studying" <i>Students discuss the statement</i>
Q5	To what extent do you feel like you have autonomy in your studying?
P6	"I feel competent at school" <i>Students discuss the statement</i>
Q6	What do you think about the statement 'I feel competent at school'? <i>Students answer the question</i>
Q7	___% of students said they study because they want others to think they're a good student. What do you think about this? <i>Students discuss, then answer the question</i>
P8	"When I don't study, I feel..." <i>Students discuss the prompt</i>
Q8	How do you feel when you <i>don't</i> study? <i>Students answer the question - when asking for expansion on answers (if appropriate), use the word 'guilty' to align with external, introjected motivation types</i>
P9	"I enjoy learning new things" <i>Students discuss the statement</i>
Q9	To what extent do you think you study because you enjoy learning new things? <i>Students answer the question</i>
P10	"My experiences are the same/similar to the experiences my friends/peers have; we're in this together" <i>Students discuss the statement</i>
Q10	To what extent do you feel like your experiences at school, and the experiences of your peers, are related? <i>Students answer the question</i>

T11	Ranking task – here are some prompts and key words. I would like you, as a group, to rank these in order of most important to least important. You can rank them however you like, with one or more prompts at any level of importance. Please feel free to discuss this as you go, and take as long as you need to.
Q12	Is there anything else that anyone would like to say, relating to motivation to study, or target grades? <i>Students have the opportunity to share anything else they would like to regarding the topic of the study. Up to them.</i>
	When I’m writing up the findings from this study, I may decide that I need to quote what you’ve said (anonymously, of course). In that case, I will use a pseudonym (fictitious name, like when an author doesn’t want to use their real name). If you would like to choose your own pseudonym, then please let me know what you would like. Otherwise, I’ll use common first names instead.

Notes

The boxes with ‘P’ codes indicate use of prompts. These prompts were printed in large font on separate sheets of paper for students to discuss. These sheets of paper have not been replicated in these appendices.

T11 Ranking Task – the words used in the ranking task were:

- autonomy
- competence
- relatedness
- target grade(s)
- pressure
- guilt
- others’ perception of me
- enjoyment

Each of these words was printed in large font on A5 paper for display in front of the students to arrange.

B3 Teacher Interview Question Sheet

Preamble

Firstly, thank you for agreeing to take part in this study. If at any point you decide that you would not like to take part anymore, then please feel free to say so, since there are no consequences whatsoever for withdrawing at any point until May 31st, 2023. At all points throughout the study, your participation will remain completely anonymous – I won't tell people you've participated, nor what you have said. Please note that I may come back to you to follow up later in the year, though I'm not expecting to at this point.

For this interview, I do have set questions that I would like to ask, but there is lots of room for discussion around the questions. Please be as honest as possible. Again – this will remain entirely anonymous. What you say will have no impact on my perception of you, the school, nor on my behaviour.

As you'll know having read the participant information sheet, this study is looking at the academic motivation of students in Years 10 and 11 across all of their subjects. Whilst I will identify whether your subject is 'core' in my description of your role, I won't give the name of the subject/s you teach. If you mention the subject you teach during the interview, I will change this in the transcript to 'my subject' / 'the subject I teach' etc, unless you would like me to. Do you have any questions about the study or your participation before we begin?

Teacher semi-structured interview questions

1. Can you describe the culture of the school in general?
2. How would you describe the culture of the school regarding academic achievement of the students?
3. Roughly how long have you been teaching?
4. What are your general thoughts on the motivation of students to study?
5. What do you think about the use of target grades with students in Years 10 and 11?
6. What do you think of the target grades that your students have been issued?
7. How, if at all, do you think you are supposed to use target grades?
8. How do you actually use target grades (if not answered already)?
9. Who do you know that uses target grades the same or differently to you?
10. Do you think your perceptions or use of target grades has changed, or will change, over time?

Questions asked to the senior leader participant:

- A. As a member of leadership, how would you describe the approach to the use of target grades by the leadership team?
- B. Where do target grades come from?

Memos to me

- Can you give me an example?
- You said a moment ago ... Could you expand on that?
- What have they not said? Can I slip in those questions subtly during the interview?
- PE, English, (Maths), Geography, Business all mentioned as subjects that use targets. Does the answer match with what the students said?

UECREf

Date

Paper

s Form

Note that the appendices to the Ethics form have been omitted, since they appear in other appendices for this thesis.

Ethics Application Form

Please answer all questions

1. Title of the investigation

Students' Experiences of Target Grade Use as an Extrinsic Motivational Tool

Please state the title on the PIS and Consent Form, if different:

2. Chief Investigator (must be at least a Grade 7 member of staff or equivalent)

Name: David Kirk

☒ Professor

☐ Reader

☐ Senior Lecturer

☐ Lecturer

☐ Senior Teaching Fellow

☐ Teaching Fellow

Department: School of Education

Telephone: 0141 444 8038

E-mail: david.kirk@strath.ac.uk

3. Other Strathclyde investigator(s)

Name: Alexander Odeneal

Status (e.g. lecturer, post-/undergraduate): EdD Student

Department: School of Education

Telephone:

E-mail: alexander.odeneal@strath.ac.uk

Name:	Dr	Dillon	Landi
Status	(e.g. lecturer,	post-/undergraduate):	Lecturer
Department:	School	of	Education
Telephone:		0141 444	8100
E-mail:	dillon.landi@strath.ac.uk		

4. Non-Strathclyde collaborating investigator(s) (where applicable)

Name:

Status (e.g. lecturer, post-/undergraduate):

Department/Institution:

If student(s), name of supervisor:

Telephone:

E-mail:

Please provide details for all investigators involved in the study:

5. Overseas Supervisor(s) (where applicable)

Name(s):

Status:

Department/Institution:

Telephone:

Email:

I can confirm that the local supervisor has obtained a copy of the Code of Practice: Yes ☐ No ☐

Please provide details for all supervisors involved in the study:

6. Location of the investigation

At what place(s) will the investigation be conducted

Salesian School, Chertsey, Surrey, England

If this is not on University of Strathclyde premises, how have you satisfied yourself that adequate Health and Safety arrangements are in place to prevent injury or harm?

The participatory school has Health and Safety policies in place, and no activities will be taking place that would not usually take place at the site of the research.

7. Duration of the investigation

Duration(years/months) : 1 year, 1 month

Start date (expected): 01 / 05 / 2022 Completion date (expected): 31 / 05 / 2023

8.

Sponsor

Please note that this is not the funder; refer to Section C and Annexes 1 and 3 of the Code of Practice for a definition and the key responsibilities of the sponsor.

Will the sponsor be the University of Strathclyde: Yes ☒ No ☐
If not, please specify who is the sponsor:

9. Funding body or proposed funding body (if applicable)

Name of funding body:
Status of proposal – if seeking funding (please click appropriate box):
☐ In preparation
☐ Submitted
☐ Accepted
Date of submission of proposal: / / Date of start of funding: / /

10. Ethical issues

Describe the main ethical issues and how you propose to address them:

Given that I am an established member of staff within the school, there may be issues of power in relationships between myself as a teacher at the school (in addition to being the researcher), and the student participants. During the SRQ-A stage of the research (see Section 16 – Methodology), this may not be an issue. However, during the focus groups, students may respond differently depending on their relationship or perception of me. To try to minimise any changes here,

I will remind students that they are encouraged to be honest, and that their views will not be shared by me, nor will their responses have any impact whatsoever on the way they are treated in school. Further, I will also be aware of the body language I exhibit whilst students talk as to not encourage any particular responses, keeping an open mind. I will also make use of a reflective field journal after each focus group. This reflective field journal will allow me to be more aware of my own feelings during the research so that I can later address any bias.

I will also have prompts that I use for the focus groups, and for the semi-structured interviews with the teaching staff. This will help to ensure that I maintain as much consistency in conducting these as possible.

Whilst every effort will be made by the researcher to maintain anonymity of all participants, given the nature of the research (i.e. within a relatively tight-knit school community), there is a possibility of anonymity not being maintained within the school community. This may occur through participants (students or teachers), sharing their responses or discussing their participation in the research with others. This will be discouraged during each focus group by reminding the student participants that the focus group is designed to be a place to share their views and experiences candidly, and that they should not share the experiences shared by their fellow participants. I'll also make it clear that this will help to ensure that validity of responses in future focus groups, since the participants will be less inclined to share their views if they're under the impression it's not being kept anonymous.

The other main risk for teaching staff is that in order to take part in the semi-structured interviews, they will need to agree to give up some of their time during, or just before or after, the working day. Given the already high teacher workload, I will make sure that teachers selected are able to choose a time that suits them as best as possible, and that they have plenty of warning. I will also ensure I'm flexible with my own time, so that they can change the time with short notice if they feel like they need to.

There is a potential for bias during this investigation. By considering my own experiences and how they may affect my expectations of the findings, I will practice critical reflexivity throughout the investigation in order to acknowledge any potential bias toward results expected by the researcher. The use of the reflective field journal will help to achieve this: I'll be able to consider why the student or teacher participants might be saying what they're saying, and how the fact that *I'm* the researcher (as opposed to someone else) is influencing this. The co-investigators will also play a role in helping to account for potential biases throughout the research. To start, this means frequent discussion about the decisions that I am making (for example in data analysis, which will be discussed in section 16); this helps to ensure consistency in use of data. Our regular supervisory meetings will provide opportunities for guidance and collaboration, allowing explanation and justification of decisions being made, to reduce the effect of my personal opinions or experiences on the interpretation of the data.

11. Objectives of investigation (including the academic rationale and justification for the investigation). Please use plain English.

Overarching Aim:

The overarching goal of this study is to explore the relationship between target grades and student motivation.

Rationale:

Target grades are the grades that students are told that they should be aiming for, by the time they finish the course that they are studying. There is an existing body of literature around the motivation of pupils aged 14-16, however the use of 'target grades' is underrepresented in the literature, and it is unclear what impact this practice has had on pupils' motivation. Given the nature of target grades, they are likely to induce a form of extrinsic motivation in pupils, if indeed they induce any motivation at all. On the surface, this extrinsic motivation may appear as *controlled motivation*, however the lack of literature makes it impossible to confirm this, nor whether autonomous motivation can also be induced, or somewhere between these two points.

Specific Purpose and Research Questions:

The first aim is to determine the extent to which students are motivated by their target grades, and specifically where this motivation lies on the autonomous-controlled motivation scale. The second aim is to determine whether these perceptions hold over the course of an academic year, or whether they vary.

From these, I will aim to answer the following research questions:

1. What type of academic motivation do students experience, and does this align with their perceptions of the use of target grades?
2. Do students' motivational types and perceptions of the use of target grades alter over the course of an academic year?
3. ~~What are teachers' perceptions of the use of target grades, and to what extent to they think target grades are motivational for students?~~
4. Is there a relationship between target grade, student motivation, and actual grade achieved?

12. Participants

Please detail the nature of the participants:
14-16 year old students in an English secondary school

Summarise the number and age (range) of each group of participants:

Pilot	(students	only):
Number: 5	Age (range) 14-16	
Main	study	(students and teachers):
Number: ~550	Age (range) 14-16	(Students)
Number: 10-15	Age (range) 22+.	(Teachers)

Please detail any inclusion/exclusion criteria and any further screening procedures to be used:

All students aged 14-16 (i.e. in Years 10 and 11) in the participating school are eligible for inclusion, unless their parents/guardians withdraw consent for their participation. More detail about how students will be selected for the focus groups can be found in section 14.

All teachers participating in the study will have been invited at random (from a list of teaching staff within the school), and will have consented to participate, creating a stratified purposive sample. More detail about how teachers will be selected can be found in section 14.

13. Nature of the participants
Please note that investigations governed by the Code of Practice that involve any of the types of participants listed in B1(b) must be submitted to the University Ethics Committee (UEC) rather than DEC/SEC for approval.
Do any of the participants fall into a category listed in Section B1(b) (participant considerations) applicable in this investigation?: Yes ☐ No ☒
If yes, please detail which category (and submit this application to the UEC):

14. Method of recruitment
Describe the method of recruitment (see section B4 of the Code of Practice), providing information on any payments, expenses, or other incentives.
The researcher is a teacher at the main participating school.
All students in Years 10 and 11 (ages 14-16) in the participating school will participate in the study, if their parents/guardians have not withdrawn consent for participation. (Any students whose parents/guardians have <u>not</u> given consent will be excluded from the study).
Students participating in the focus group elements will have been deliberately selected to represent a range of data from the SRQ-A. Once the mean-average score for each motivation type

has been calculated for each student (and therefore which motivation type they most align with has been identified), a random number generator will be used to select random students (using their unique numerical identifying code) to participate in the focus group; the first pupil returned by the generator that aligns with each motivational type (including 'amotivation') will be invited to participate in the focus group. Should a selected student not wish to partake in the focus group, then the random number generator will be used again until another student of that motivational type is selected and agrees to participation.

A stratified purposive sample of teachers will be used: teachers participating in the interviews will have been selected randomly from a list of all qualified teaching staff within the participating school. To achieve this, I will obtain a list of all the qualified teaching staff in the school and assign each a unique numerical code. A random number generator will then be used to select the staff members. Should a selected staff member not wish to partake, the generator will be used again to select another member of staff in their place.

There will be no payments or incentives provided for participation.

15. Participant consent

Please state the groups from whom consent/assent will be sought (please refer to the Guidance Document). The PIS and Consent Form(s) to be used should be attached to this application form.

Prior to consent being sought, all parents/guardians of students will be supplied with a Participant Information Sheet (PIS). This will be written in plain English so anyone can understand it – in the case that the parent/guardian of a pupil needs to read a translated (non-English) PIS, I will work with school officials to accommodate this. The PIS will inform the parents/guardians of the aims of the study, what data will be collected, how the data will be anonymised and used, and how to withdraw consent from the study (either by not consenting, or later in the study) should they so wish. It will also include the researcher's (and their supervisors') university email addresses, as well as the School of Education Ethics Board email address, so that parents/guardians can ask any clarifying questions they may have. The PIS for parents/guardians can be found in Appendix A.

Consent will be sought from the parents/guardians of all students in Years 10 and 11 in the participant school. Given that the school routinely issues students with questionnaires and holds focus groups for pupils twice in the year usually, collection of consent will occur through an **opt-out** system, whereby parents/guardians will be able to withdraw consent for participation of their child at any point until the end of the data collection phase on May 31st, 2023.

Since the SRQ-A will be sat during a regularly timetabled PSHE lesson for each entire year group simultaneously, students will be encouraged to complete the survey to allow for completeness

of data, however, should they not wish to take part in the survey, other tasks will be provided for students to complete instead (these will be the same tasks as provided for students whose parents/guardians have not consented to participation for their child/ward).

The first reason an opt-out method of consent has been chosen is to encourage higher response rates, since opt-in methods of consent tend to lead to lower response rates, yet this method still provides the (prospective) participants with all the information they need beforehand to make an informed decision, and is no more stressful for the participants to take part (Hunt, Shlomo & Addington-Hall, 2013), even if the material turns out to be of a sensitive nature (which is not expected in this study). Second, the students whose parents/guardians do not actively provide consent for participation may be more likely to be from socioeconomically disadvantaged backgrounds, which would lead to the exclusion of that particular demographic from participation. As a result, the data collected may be less generalisable than is desirable and will not be truly representative of the wider student cohort; it has been shown that opt-out methods of obtaining consent are more likely to be inclusive of a wider range of students and therefore be more representative of the student population (Henshall et al., 2021).

Teachers who are invited to participate will be issued a separate Participant Information Sheet (Appendix B) for the semi-structured interviews, detailing the same information as the parents/guardians of the student participants. The Teacher Information Sheet will differ in that it will explain what data will be collected from the interview, rather than through the SRQ-A and focus groups. If teachers do not wish to consent to participation, then they are welcome to not participate. Consent may be withdrawn at any stage until data has been anonymised for analysis. Up until this point, any data recorded for that teacher will be destroyed.

References

Henshall C, Potts J, Walker S, et al. Informing National Health Service patients about participation in clinical research: A comparison of opt-in and opt-out approaches across the United Kingdom. *Australian & New Zealand Journal of Psychiatry*. 2021;55(4):400-408. doi:10.1177/0004867420973261

Hunt, K. J., Shlomo, N., and Addington-Hall, J. (2013). "Participant Recruitment in Sensitive Surveys: A Comparative Trial of 'opt In' versus 'opt Out' Approaches." *BMC Medical Research Methodology*, 13(3). doi: 10.1186/1471-2288-13-3

16.

Methodology

Investigations governed by the Code of Practice which involve any of the types of projects listed in B1(a) must be submitted to the University Ethics Committee rather than DEC/SEC for approval.

Are any of the categories mentioned in the Code of Practice Section B1(a) (project considerations) applicable in this investigation? ☐ Yes ☒ No

If 'yes' please detail:

Describe the research methodology and procedure, providing a timeline of activities where possible. Please use plain English.

Methodology

Overarching Design

In order to address the four research questions, this study will be a mixed methods study. This will consist of issuing the Self-Regulation Questionnaire-Academic (SRQ-A) to all student participants at three points across an academic year. The SRQ-A has been validated by Ryan and Connell (1989) for use with English-speaking school students. Following each of these, a focus group will take place shortly afterwards with a small group of students. The students will be deliberately selected for the focus groups to represent a range of views demonstrated in the SRQ-A. In addition, some of the teaching staff (randomly selected *within* the school) will participate in semi-structured interviews.

Data Collection

Both quantitative and qualitative data will be generated using the methods mentioned. Quantitative data will come from the SRQ-A results, but the focus groups and semi-structured interviews will both yield qualitative data.

At three points in the academic year, the student participants will complete the SRQ-A questionnaire. For Year 11, this will occur in September, and then shortly after each round of mock examinations (in around December and March). For Year 10, the first round will occur in October following the issuing of their target grades from each subject. The following two rounds will also follow the school-wide rounds of assessments in around January and May. The focus groups will be used to discern additional detail from the students about their views on their academic motivation, and how this relates to their target grades.

The SRQ-A questionnaire is not expected to take longer than 30 minutes for students to complete (though this will be confirmed during the pilot); this will occur at a time during the school day so that students have up to 50 minutes to complete the survey if required. Since the students will be in the classroom at the time, tasks relating to the PSHE curriculum will be assigned after completion of the questionnaire.

In addition, closely following the issuing of target grades (from October to November), 15 teaching staff will take part in semi-structured interviews. These will focus on the teachers' perception of the culture of the school in general, the culture of the school relating to academic achievement, their perceptions on the motivation of students to study, their perceptions on the use of target grades in general as well as at the school, and then how they use target grades in their own classroom (if at all).

Data Analysis

Since the SRQ-A requires each student to rate their level of agreement with a series of statements regarding different types of academic achievement on a scale of 1-5, the average score for the four statements for each type of motivation will be (mean-)averaged, where a higher score indicates the student more closely aligns with that type of motivational regulation. In addition, the modal regulation type will be calculated for the year group, as well as the standard deviation for each motivational type. I will also calculate, for each student at each point in the year, their Relative Autonomy Index, a composite score indicating autonomy level in their motivation. Finally,

the Cronbach alpha statistic will provide a coefficient of reliability (Niemic et al., 2006; Soenens et al., 2012; Cohen et al., 2018).

The focus groups and semi-structured interviews will undergo thematic analysis. I will do this through the use of an emergent coding method. Examples of this may include identifying responses that indicate *amotivation* (even if the word 'amotivation' is not explicitly used), or students indicating an appreciation of the use of target grades by teachers. I will discuss this process regularly with the co-investigators, to determine whether they agree with the codes that have been assigned to responses given by participants. This means that I'll be able to thoroughly code all data, and that no responses will be automatically excluded (as may be the case if a predetermined coding frame is used) - a more inclusive method of analysis; the agreement of the co-investigators will also aid with trustworthiness in the coding of the data. Once data is coded, I will be able to identify themes by examining all the data that uses a particular code (for example, looking for themes lying within the data coded with 'amotivation' during the student focus groups), and then repeating for different individual codes. Themes may become known through patterns in the coding, or if there appears to be a link between two or more codes. The themes arising from the focus groups will be used to add further context to the results from the SRQ-A. The themes from the interviews will also be used to add additional context, not only to the results from the students, but also to the wider school and with an aim to answer the third research question.

Trustworthiness

Trustworthiness in the SRQ-A results will be supported not only from the use of the Cronbach alpha statistic for reliability, but also from some controlling factors such as the environment that students sit the questionnaire in (for example, a silent room with no interference from others). Additionally, trustworthiness will be gained from the use of the focus groups since these will address a range of perspectives (as given by the SRQ-A results), and the use of a focus group will allow students to be more open since they will be with peers (rather than in a more intense one-to-one environment). Creating a comfortable and friendly environment will also aid in helping students feel they can be as open as possible. Further, in both the focus groups *and* semi-structured interviews, I will ensure that my body language and responses don't indicate personal preferences, so that participants are not swayed to respond in a certain way. Finally, trustworthiness can be improved through the use of the expertise of the co-investigators (my supervisors). In general, this will come from general advice from both supervisors. More specifically, this means in-depth discussion about emergent codes and themes coming from the focus group and interview data. Thorough explanation of why I code specific responses in certain ways and identifying how the codes combine into themes throughout the data (including how these themes link with the SRQ-A results as described earlier) means that the effect of my personal opinions and preconceptions can be reduced.

Provisional Timeline

May-June 2022 – Pilot study at main study school, with students in the academic year group above those participating in the main study

June-July 2022 – Consent for student participants gained

Academic year 2022-2023:

SRQ-A taking place at three points for each year group (Year 11: September, December, March & Year 10: September, January and May – dates may vary slightly depending on school calendar)

Focus groups: within two weeks of the SRQ-A for each year group

Interviews: October and November of 2022

Analysis of data to follow each collection point, and be continuous from there.

References

Cohen, L., Manion, L. and Morrison, K. (2018). *Research Methods in Education* (8th ed.). Oxon: Routledge.

Kerlinger, F. N. (1970). *Foundations of Behavioral Research*. New York: Holt, Rinehart & Winston.

Niemiec, Christopher P, Lynch, Martin F, Vansteenkiste, Maarten, Bernstein, Jessey, Deci, Edward L, & Ryan, Richard M. (2006). The antecedents and consequences of autonomous self-regulation for college: A self-determination theory perspective on socialization. *Journal of Adolescence* (London, England.), 29(5), 761-775.

O'Donoghue, T. (2007). *Planning your Qualitative Research Project: An introduction to interpretivist research in education*. New York: Routledge.

Ryan, R. M. and Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57, 749-761.

Soenens, B., Sierens, E., Vansteenkiste, M., Doochy, F. and Goossens, L. (2012). Psychologically Controlling Teaching: Examining Outcomes, Antecedents, and Mediators. *Journal of Educational Psychology*, 104(1), 108-120.

What specific techniques will be employed and what exactly is asked of the participants? Please identify any non-validated scale or measure and include any scale and measures charts as an Appendix to this application. Please include questionnaires, interview schedules or any other non-standardised method of data collection as appendices to this application.

SRQ-A

The student participants will be asked to complete the SRQ-A questionnaire via a Microsoft Form. This will happen through use of school devices (laptops, desktop computers, iPads) in classrooms with access to those facilities. Students will be required to respond to a series of statements, detailing their level of agreement with each statement, as detailed above.

Focus groups

Students in each focus group will be asked about:

- Do you feel motivated to study? If so, why?
- How do you feel about the target grades you have been assigned?
- Tell me about the experiences you have of your teachers using your target grades.
- Do you enjoy learning new things?
- Do you ever study just because you feel like you should?
- If you ever avoid studying, does it ever create any particular feelings?
- Do you ever feel pressured to study? If so, why?

Teacher semi-structured interviews

Teachers will be asked in these interviews about:

- How would you describe the culture of the school in general?
- How would you describe the culture of the school in terms of academic achievement? (*only if not answered in first question*)
- To what extent do you think the students at our school are motivated to study?
- What do you think about the target grades that are issued to Year 10 and 11 students?
- How do you think the school would like you to use target grades, if at all?
- Do you use the students' target grades to influence any of your decisions? If so, how?

Where an independent reviewer is not used, then the UEC, DEC or SEC reserves the right to scrutinise the methodology. Has this methodology been subject to independent scrutiny? Yes

☐

No

☒

If yes, please provide the name and contact details of the independent reviewer:

17. Previous experience of the investigator(s) with the procedures involved.

Experience should demonstrate an ability to carry out the proposed research in accordance with the written methodology.

David Kirk is a Professor in the School of Education. He has successfully supervised over 40 doctoral students since 1989 in six countries. He has expertise in the use of qualitative research methods in educational settings, in particular semi-structured interviews, focus groups and curriculum history. His most recent work with an activist approach has been centrally concerned with the professional development of physical education teachers in school-based professional learning.

Dillon Landi is a Lecturer in the School of Education. He has either led or been a part of 6 research projects leading to 20+ publications. He has a background in both quantitative and qualitative (primarily ethnographic and interview-based studies) methods. His work surrounds equity and diversity within health, wellbeing, and education settings. Prior to research he was a public-school teacher and supervisor for the largest school district in New Jersey USA.

Alexander Odeneal earned a Master of Arts degree in Education from the Institute of Education at University College London, writing a dissertation entitled 'Teacher and student perspectives on the educational attainment gap between boys and girls at Key Stage 4', where one of the primary foci related to the use of target grades. The topic for his EdD study considers the extent to which the use of target grades in schools with Key Stage 4 students as an extrinsic motivational tool is motivational. Whilst inexperienced with holding focus groups, the aim of the pilot

study will be to practise this skill to ensure that focus groups for the main study run smoothly, for example ensuring the provision of an appropriate amount of time for each data collection event (e.g., a focus group), and to confirm wording of planned questions to use in the focus groups is appropriate for the student participants to understand. The pilot study will not lead to changes in the overarching aims or design of the study.

18. Data collection, storage and security

How and where are data handled? Please specify whether it will be fully anonymous (i.e. the identity unknown even to the researchers) or pseudo-anonymised (i.e. the raw data is anonymised and given a code name, with the key for code names being stored in a separate location from the raw data) - if neither please justify.

The data from the SRQ-A will be pseudo-anonymised immediately after completion; when students complete the questionnaire at each point in the year, their full name will be collected. In one folder will be a document outlining student full names, and a digital 'code book' giving a unique identifier for each student. In a separate folder, the raw data will be recorded, identifiable using only the unique identifier. Both folders will be stored in my Strathclyde OneDrive account.

The recordings (i.e. raw data) from the focus groups and interviews will contain the use of names. When these focus groups and interviews are transcribed, the students' or teachers' names will be replaced by codes according to the same code book as mentioned above, to allow consistency with the data.

Explain how and where it will be stored, who has access to it, how long it will be stored and whether it will be securely destroyed after use:

Only the named researchers will have access to the data, and the code book. The audio recordings of interviews and focus groups will be destroyed upon completion of the relevant transcript.

Following the completion of the data generation (i.e. once all responses from every method are collected, and assigned the relevant unique identifier), the names and code book will also be destroyed, leaving only the raw data with the unique identifiers.

All the electronic data will be stored indefinitely after the completion of the study to allow for further analysis to inform further academic activity.

Will anyone other than the named investigators have access to the data? Yes ☐ No ☒
If 'yes' please explain:

19. Potential risks or hazards
Briefly describe the potential Occupational Health and Safety (OHS) hazards and risks associated with the investigation:
There are no OHS hazards or risks from participating in this study. No actions are required from any participants that they would not experience in the research setting usually.
Please attach a completed eRisk Assessment for the research. Further Guidance on Risk Assessment and Form can be obtained on <u>Occupational Health, Safety and Wellbeing's webpages</u>

20. What method will you use to communicate the outcomes and any additional relevant details of the study to the participants?
A presentation to the staff at the participating school will outline the methodology and findings from the study.
If students express an interest in the results, then this may be presented in an assembly early in the following academic year to each of the participating year groups.

21. How will the outcomes of the study be disseminated (e.g. will you seek to publish the results and, if relevant, how will you protect the identities of your participants in said dissemination)?
I will attempt to publish the findings from the study in relevant academic journals following completion. The identities of the participants will be protected through the use of unique identifiers, and removal of any further identifying information given in the responses from any data generation method.

Checklist	Enclosed	N/A
Participant Information Sheet(s)	☒	☐
Consent Form(s)	☒	☐
Sample questionnaire(s)	☒	☐
Sample interview format(s)	☒	☐
Sample advertisement(s)	☐	☒
OHS Risk Assessment (S20) – submitted as e-risk form online	☒ ☐	☐ ☒
Any other documents (please specify below)	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐

22. Chief Investigator and Head of Department Declaration

Please note that unsigned applications will not be accepted and both signatures are required

I have read the University's Code of Practice on Investigations involving Human Beings and have completed this application accordingly. By signing below, I acknowledge that I am aware of and accept my responsibilities as Chief Investigator under Clauses 3.11 – 3.13 of the Research Governance Framework and that this investigation cannot proceed before all approvals required have been obtained.

Signature of Chief Investigator



Please also type name here:

I confirm I have read this application, I am happy that the study is consistent with departmental strategy, that the staff and/or students involved have the appropriate expertise to undertake the study and that adequate arrangements are in place to supervise any students that might be acting as investigators, that the study has access to the resources needed to conduct the proposed research successfully, and that there are no other departmental-specific issues relating to the study of which I am aware.

Signature of Head of Department



Please also type name here

04/04/2022

Date:

/ /

23. Only for University sponsored projects under the remit of the DEC/SEC, with no external funding and no NHS involvement

Head of Department statement on Sponsorship

This application requires the University to sponsor the investigation. This is done by the Head of Department for all DEC applications with exception of those that are externally funded and those which are connected to the NHS (those exceptions should be submitted to R&KES). I am aware of the implications of University sponsorship of the investigation and have assessed this investigation with respect to sponsorship and management risk. As this particular investigation is within the remit of the DEC and has no external funding and no NHS involvement, I agree on behalf of the University that the University is the appropriate sponsor of the investigation and there are no management risks posed by the investigation.

If not applicable, tick here ☐

Signature of Head of Department

Please also type name here

Date: / /

For applications to the University Ethics Committee, the completed form should be sent to ethics@strath.ac.uk with the relevant electronic signatures.

24. Insurance

The questionnaire below must be completed and included in your submission to the UEC/DEC/SEC:

Is the proposed research an investigation or series of investigations conducted on any person for a Medicinal Purpose? Medicinal Purpose means: ▪ treating or preventing disease or diagnosing disease or ▪ ascertaining the existence degree of or extent of a physiological condition or ▪ assisting with or altering in any way the process of conception or ▪ investigating or participating in methods of contraception or ▪ inducing anaesthesia or ▪ otherwise preventing or interfering with the normal operation of a physiological function or ▪ altering the administration of prescribed medication.	Yes / No
--	--------------------------------

If “**Yes**” please go to **Section A (Clinical Trials)** – all questions must be completed

If “**No**” please go to **Section B (Public Liability)** – all questions must be completed

Section A (Clinical Trials)

Does the proposed research involve subjects who are either: i. under the age of 5 years at the time of the trial; ii. known to be pregnant at the time of the trial	Yes / No
--	--------------------------------

If “**Yes**” the UEC should refer to Finance

Is the proposed research limited to: iii. Questionnaires, interviews, psychological activity including CBT; iv. Venepuncture (withdrawal of blood); v. Muscle biopsy; vi. Measurements or monitoring of physiological processes including scanning; vii. Collections of body secretions by non-invasive methods; viii. Intake of foods or nutrients or variation of diet (excluding administration of drugs).	Yes / No
--	--------------------------------

If “**No**” the UEC should refer to Finance

Will the proposed research take place within the UK?	Yes / No
---	--------------------------------

If “No” the UEC should refer to Finance

Title of Research	Students’ Experiences of Target Grade Use as an Extrinsic Motivational Tool	
Chief Investigator	David Kirk	
Sponsoring Organisation	N/A	
Does the proposed research involve:		
a) investigating or participating in methods of contraception?	Yes / No	
b) assisting with or altering the process of conception?	Yes / No	
c) the use of drugs?	Yes / No	
d) the use of surgery (other than biopsy)?	Yes / No	
e) genetic engineering?	Yes / No	
f) participants under 5 years of age(other than activities i-vi above)?	Yes / No	
g) participants known to be pregnant (other than activities i-vi above)?	Yes / No	
h) pharmaceutical product/appliance designed or manufactured by the institution?	Yes / No	
i) work outside the United Kingdom?	Yes / No	

If “YES” to **any** of the questions a-i please also complete the **Employee Activity Form** (attached).

If “YES” to **any** of the questions a-i, and this is a follow-on phase, please provide details of SUSARs on a separate sheet.

If “Yes” to any of the questions a-i then the UEC/DEC/SEC should refer to Finance (insurance-services@strath.ac.uk).

Section B (Public Liability)		
Does the proposed research involve :		
a) aircraft or any aerial device	Yes / No	
b) hovercraft or any water borne craft	Yes / No	

c) ionising radiation	Yes / No
d) asbestos	Yes / No
e) participants under 5 years of age	Yes / No
f) participants known to be pregnant	Yes / No
g) pharmaceutical product/appliance designed or manufactured by the institution?	Yes / No
h) work outside the United Kingdom?	Yes / No

If **“YES”** to any of the questions the UEC/DEC/SEC should refer to Finance (insurance-services@strath.ac.uk).

12 Appendix D: Statistics Summary Tables

D1 Internal Consistency and Reliability

Internal Consistency	Year 10		Year 11	
	α	M	α	M
Round 1				
Intrinsic	.840		.835	
Identified	.841		.817	
Introjected	.807	.821	.791	.796
External	.747		.723	
Amotivation	.872		.814	
Round 2				
Intrinsic	.825		.811	
Identified	.865		.803	
Introjected	.840	.837	.781	.770
External	.814		.664	
Amotivation	.840		.789	
Round 3				
Intrinsic	.840		.836	
Identified	.841		.848	
Introjected	.837	.823	.822	.825
External	.761		.761	
Amotivation	.834		.860	
Mean per year group	.827		.797	
Mean for whole sample		.812		

Table 12.1: Calculated values for Cronbach's Alpha for each motivation type for each year group during each data collection round, with mean values

D2 Descriptive Statistics

		TGAI values											
		M	SD	Min	Q1	Median	Q3	Max	Range	Change Between Rounds	<i>t</i>	<i>p</i>	Skew
Year 10													
Point 1	0.50	1.89	-5.00	0.00	0.00	1.00	6.00	11.00	1-2	0.397	0.346	0.184	
Point 2	0.38	1.81	-6.00	0.00	0.00	1.00	10.00	16.00	2-3	-0.272	0.607		
Point 3	0.59	2.25	-5.00	0.00	0.00	2.00	11.00	16.00	1-3	-0.399	0.655		
Year 11													
Point 1	0.51	2.09	-6.00	0.00	0.00	2.00	8.00	14.00	1-2	2.351	0.0102*	0.726	
Point 2	0.09	2.30	-7.00	-1.00	0.00	2.00	8.00	15.00	2-3	-1.022	0.845		
Point 3	0.28	2.65	-8.00	-1.00	0.00	2.00	12.00	20.00	1-3	0.450	0.327		

Table 12.2 - Summary of TGAI values through the year for each year group, change between each point in the year, and skew and excess kurtosis

	RAI values								Change Between Rounds	<i>t</i>	<i>p</i>	Skew
	M	SD	Min	Q1	Median	Q3	Max	Range				
Year 10												
Point 1	-1.40	2.69	-7.75	-3.25	-1.25	0.25	7.25	15.00	1-2	2.862	.00245**	0.431
Point 2	-1.84	2.61	-7.75	-3.75	-1.75	0.00	7.00	14.75	2-3	-1.962	0.974	
Point 3	-1.55	2.29	-8.25	-3.00	-1.25	-0.25	7.50	15.75	1-3	0.909	0.183	
Year 10												
Point 1	-1.43	2.98	-10.50	-3.25	-1.75	0.25	9.00	19.50	1-2	0.380	0.353	0.411
Point 2	-1.69	2.78	-7.75	-3.50	-1.75	-0.25	8.25	16.00	2-3	-0.202	0.580	
Point 3	-1.81	3.12	-8.50	-3.75	-1.75	0.00	6.75	15.25	1-3	1.08	0.142	

Table 12.3 - Summary of RAI values through the year for each year group, change between each point in the year, and skew and excess kurtosis

D3 Inferential Statistics

TGAI Round	Year Group	Spearman Rank Correlation Coefficient				Linear Regression Intercept	<i>p</i>	Linear Regression Gradient	<i>p</i>
		Round 1	Round 2	Round 3	Mean				
1	10	.239	–	–	–	–	–	–	–
	11	.216	–	–	–	–	–	–	–
2	10	–	.058	–	–	–	–	–	–
	11	–	.027	–	–	–	–	–	–
3	10	–	–	.199	–	–	–	–	–
	11	–	–	.135	–	–	–	–	–
Mean	10	–	–	–	.256	0.757	<.001***	0.148	<.001***
Mean	11	–	–	–	.180	0.552	<.001***	0.116	.0053**

Table 12.4 - Spearman Rank Correlation Coefficient (SRCC) and linear regression gradients for the relationship between RAI and TGAI

	SRCC	Intercept	<i>p</i>	Linear regression gradient	<i>p</i>
Year 10	0.008	0.656	.327	-0.019	.840
Year 11	-0.092	1.512	.028*	-0.166	.097

Table 12.5 - SRCC and linear regression for TGAI dependence on mean target grade, with associated *p*-values

	SRCC	Intercept	<i>p</i>	Linear regression gradient	<i>p</i>
Year 10	−.078	−0.868	.412	−0.102	.492
Year 11	−.042	−1.266	.225	−0.042	.781

Table 12.6 - SRCC and linear regression for RAI dependence on mean target grade, with associated *p*-values

	Intercept	<i>p</i>	Target Grade (gradient)	<i>p</i>	RAI Value (gradient)	<i>p</i>
Year 10	0.784	.230	−0.004	.966	0.148	<.001***
Year 11	1.653	.016*	−0.161	.103	0.111	.010*

Table 12.7 - SRCC and multiple linear regression for TGAi dependence on mean target grade and mean RAI value, with associated *p*-values

D4 Motivation Type Tie Distributions

Two-way ties	1	2	3	4	5
Round 1					
1. Intrinsic	-				
2. Identified	5	-			
3. Introjected	0	15	-		
4. External	0	12	13	-	
5. Amotivation	0	3	0	6	-
Round 2					
1. Intrinsic	-				
2. Identified	2	-			
3. Introjected	0	14	-		
4. External	0	11	9	-	
5. Amotivation	0	5	1	4	-
Round 3					
1. Intrinsic	-				
2. Identified	2	-			
3. Introjected	0	18	-		
4. External	0	9	6	-	
5. Amotivation	0	3	1	0	-

Table 12.8 - Left: Motivation type ties for both year groups together at each point in the year. Right: Tables showing the number of 3+-way ties and the number of combinations of motivation type

D5 Motivation Type Distribution by Random Seed, and Statistical Difference Between Tests

	Tie-Breaking Method						Result		Mean	
	Seed(1)		Seed(28)		Seed(10)		χ^2	p	Count	%
	n	%	n	%	n	%				
collection point 1										
Intrinsic	10	2.5%	8	2.0%	9	2.3%	0.99373	.9983	9	2.3%
Identified	155	38.9%	157	39.4%	158	39.7%			157	39.4%
Introjected	75	18.8%	78	19.6%	72	18.1%			75	18.8%
External	114	28.6%	108	27.1%	116	29.1%			113	28.3%
Amotivated	44	11.1%	47	11.8%	43	10.8%			45	11.2%
collection point 2										
Intrinsic	4	1.7%	5	2.2%	6	2.5%	1.105	.9975	5	2.1%
Identified	78	32.2%	80	35.1%	80	33.1%			79	33.4%
Introjected	51	21.1%	46	20.2%	49	20.2%			49	20.5%
External	67	27.7%	58	25.4%	67	27.7%			64	27.0%
Amotivated	42	17.4%	39	17.1%	40	16.5%			40	17.0%
collection point 3										
Intrinsic	4	1.8%	4	1.8%	5	2.2%	0.7858	.9993	4	1.9%
Identified	82	36.8%	88	39.5%	82	36.8%			84	37.7%
Introjected	53	23.8%	50	22.4%	54	24.2%			52	23.5%
External	52	23.3%	48	21.5%	50	22.4%			50	22.4%
Amotivated	32	14.3%	33	14.8%	32	14.3%			32	14.5%

Table 12.9 - Number and proportion of students aligned with each motivation type at each point in the year (with mean values for conclusions), for each random seed method of distributing students with motivation type ties, and the associated Chi Square tests

D7 Visual Comparison of Motivation Type Distribution by Tie-Breaking Method Test, Including Sorting by Most and Least Autonomous Motivation Type

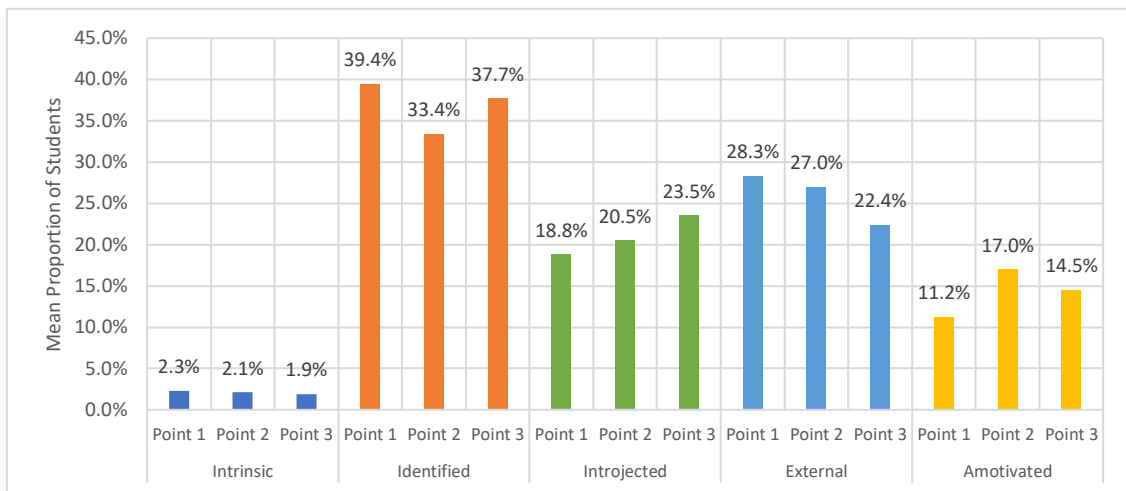


Figure 12.1 - Grouped bar chart showing the proportion of student aligning with each motivation type at each data collection point in the year. Repeat of Figure 4.13.

D8 Proportion of students associated with each grouped motivation category through the year

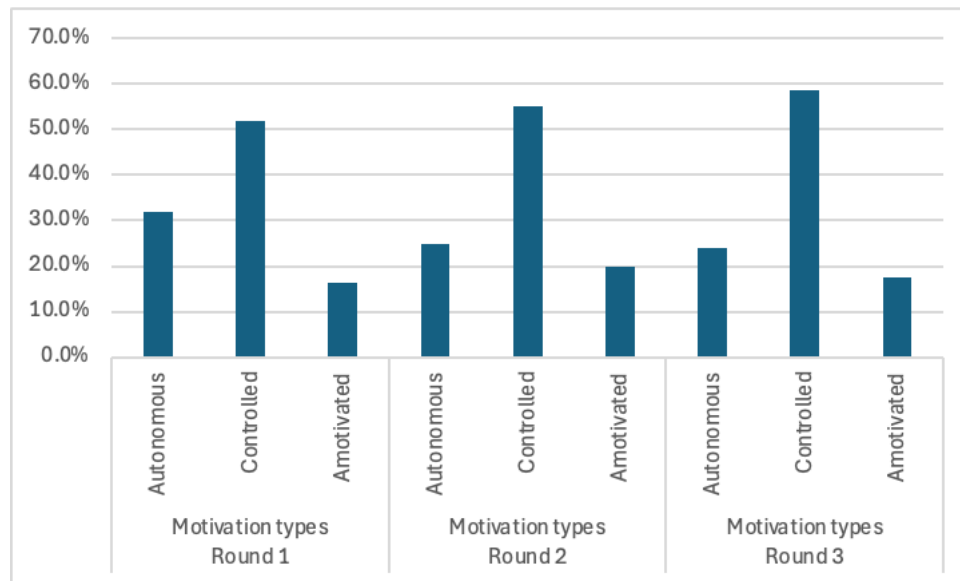
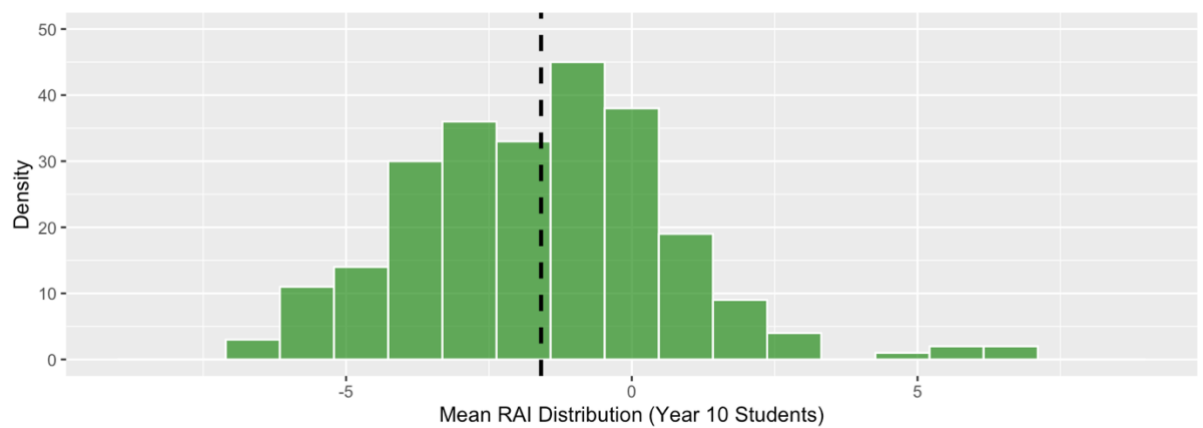
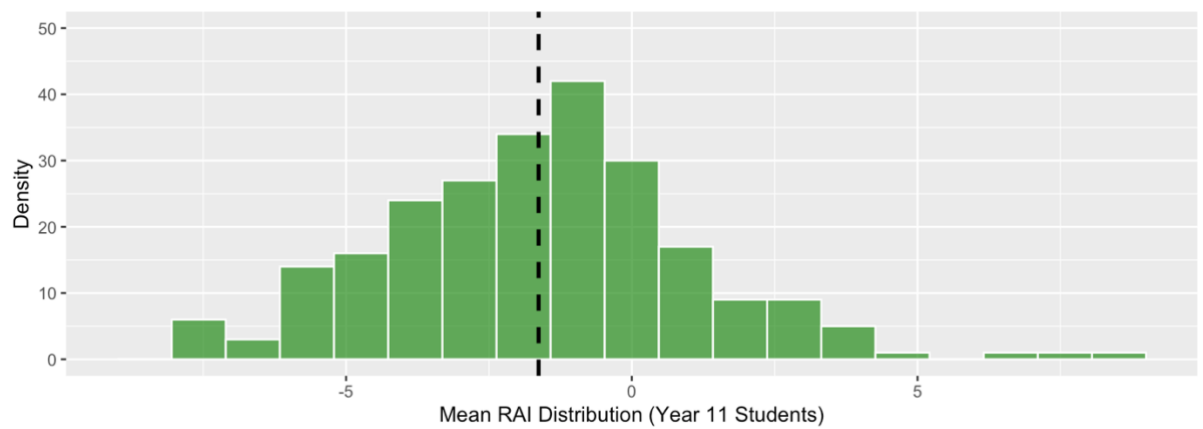


Figure 12.2 - Bar charts showing the proportion of students aligned with each grouped motivation type (autonomous vs controlled vs amotivated) at each data collection point.

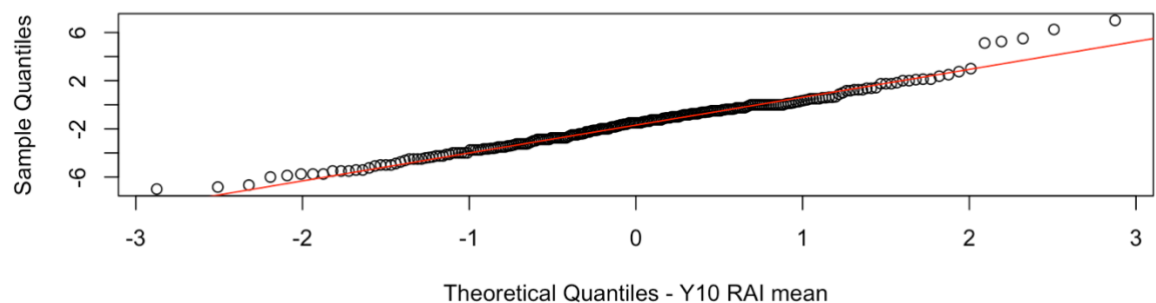
13 Appendix E: Visualisations of Data Collected

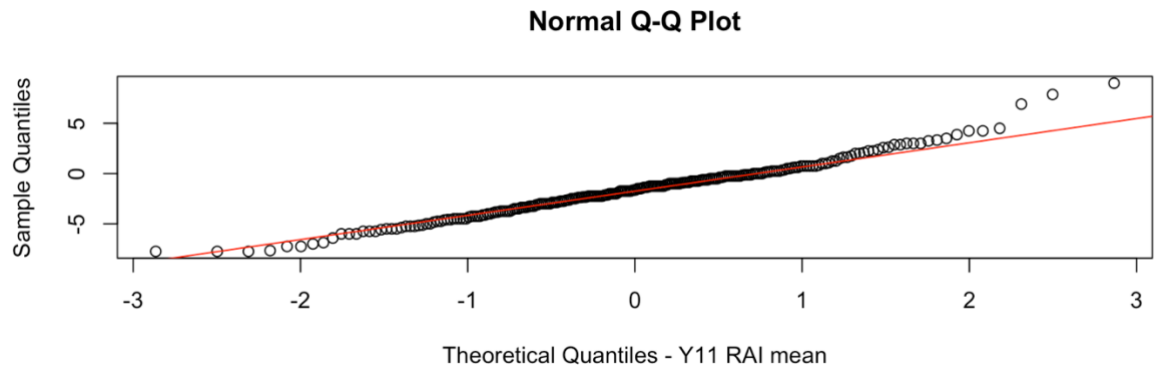
E1 Histograms of RAI values



E2 Q-Q Plots for RAI values

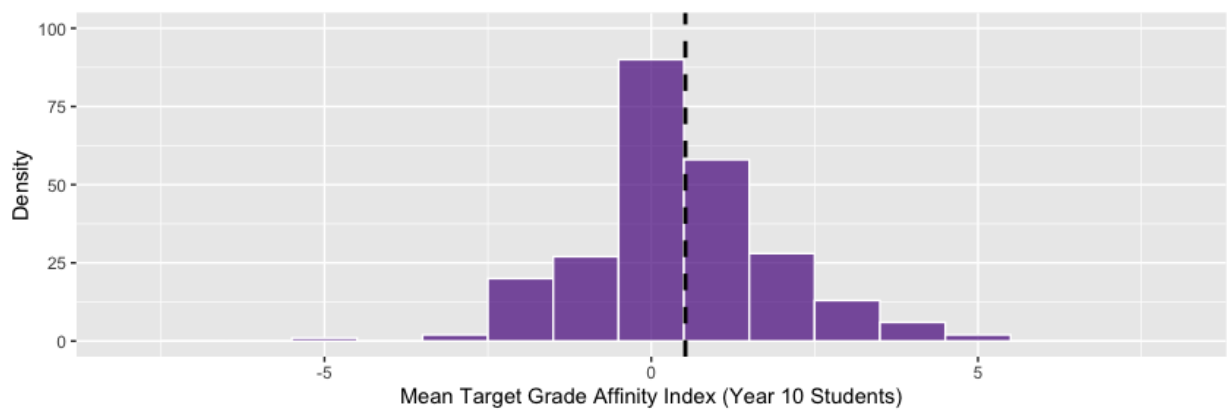
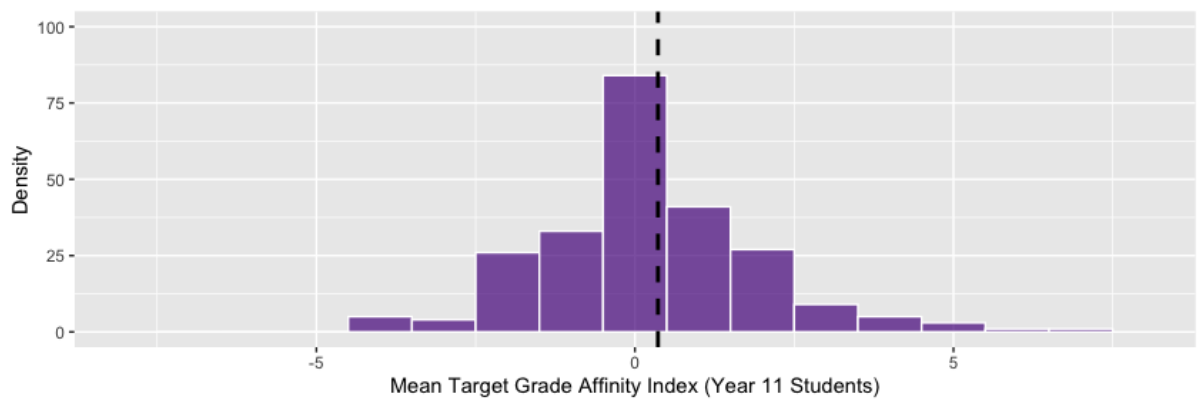
Normal Q-Q Plot



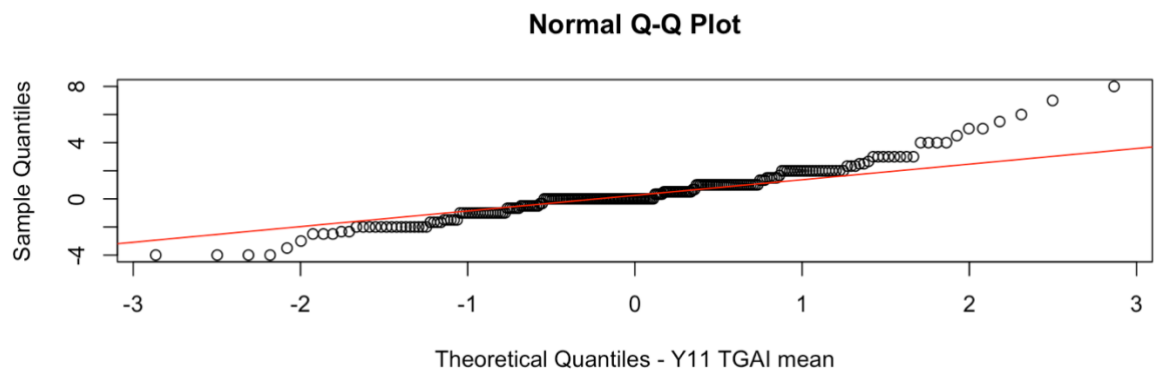
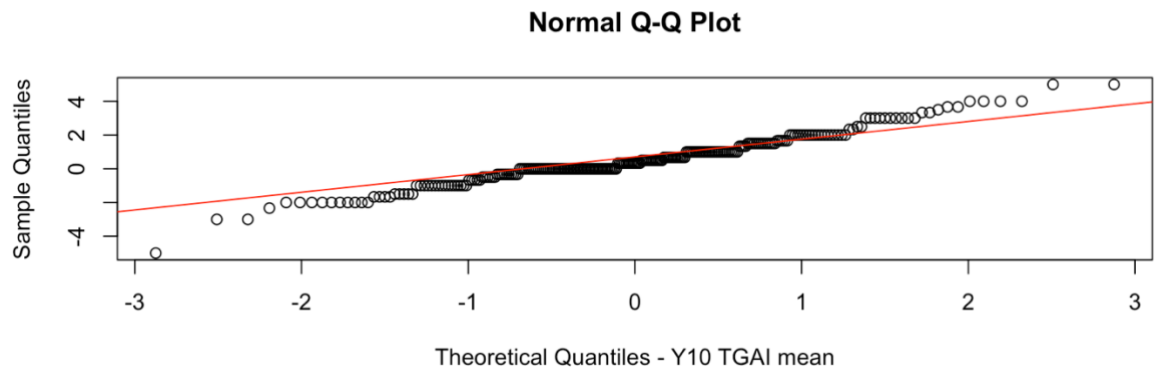


E3 Histograms of TGAi values

Note that these histograms are presented in section 4.2.1 Measurements of TGAi



E4 Q-Q Plots for TGAI values



14 Appendix F – Code for Analysis in R

```
"" EdD Quantitative Analysis - Alexander Odeneal ""

### SET UP FOR ANALYSIS ###

# import dplyr
library(dplyr)

# import Y10 data
# sets working directory for this project
setwd("/Users/aeodeneal/Library/CloudStorage/OneDrive-
UniversityofStrathclyde/_Academic/01 EdD Strath/_THESIS/Data
Generation/quant_data")

# import the data
df10 <- read.csv('/Users/aeodeneal/Library/CloudStorage/OneDrive-
UniversityofStrathclyde/_Academic/01 EdD Strath/_THESIS/Data
Generation/quant_data/new_year10_all_data.csv', header = TRUE, sep = ',')
rownames(df10) <- df10$UI # sets UI as the index column, rather than arbitrary
numbers

df10 <- data.frame(df10)
mean_targets <- df10$mean_target

# add column to data with year group (same for all rows)
df10$year_group <- "Year 10"
df10 <- relocate(df10, year_group, .after = "UI")

# import Y11 data

df11 <- read.csv('/Users/aeodeneal/Library/CloudStorage/OneDrive-
UniversityofStrathclyde/_Academic/01 EdD Strath/_THESIS/Data
Generation/quant_data/srqa11_all_data.csv', header = TRUE, sep = ',')
rownames(df11) <- df11$UI # sets UI as the index column, rather than arbitrary
numbers

df11 <- data.frame(df11)

mean_targets <- df11$mean_targets

# add column to dataframe with year group (same for all rows)
df11$year_group <- "Year 11"
df11 <- relocate(df11, year_group, .after="UI")
colnames(df11)[colnames(df11) == 'mean_targets'] <- 'mean_target' # ensures
mean target col names match

# combine two dataframes into one with rbind (to add more *rows* rather than
columns)

df <- rbind(df10, df11)
# note that separate df still exist. these will be replaced later after row-
wise analysis

### DESCRIPTIVE STATISTICS ###
#these calculations are happening with both year groups at a time - not
calculating per year group stats yet

# Transform responses from srqa
```

```

avals1 <- select(df, c(A1a, A2a, A3a, A4a))
ameans1 = rowMeans(avals1, na.rm=TRUE)

evals1 <- select(df, c(E1a, E2a, E3a, E4a))
emeans1 = rowMeans(evals1, na.rm=TRUE)

nvals1 <- select(df, c(N1a, N2a, N3a, N4a))
nmeans1 = rowMeans(nvals1, na.rm=TRUE)

dvals1 <- select(df, c(D1a, D2a, D3a, D4a))
dmeans1 = rowMeans(dvals1, na.rm=TRUE)

ivals1 <- select(df, c(I1a, I2a, I3a, I4a))
imeans1 = rowMeans(ivals1, na.rm=TRUE)

# append the new set of values to the dataframe without creating a new
dataframe
df <- cbind(df, amean1, emean1, nmean1, dmean1, imean1)

meanonly <- select(df, c(amean1, emean1, nmean1, dmean1, imean1)) #
selects just the mean values
set.seed(10)
mot_type1 = colnames(meanonly)[max.col(meanonly)] # produces the col name
for each row with the highest val
df <- cbind(df, mot_type1) # appends those colnames to the dataframe

RAI1 = ((-2*emean1) + (-1*nmean1) + (1*dmean1) + (2*imean1))
round(RAI1, digits = 2)
df <- cbind(df, RAI1)

motttype_a_calc1 <- select(df, c(I1a, I2a, I3a, I4a, D1a, D2a, D3a, D4a))
motttype_a1 = as.numeric(rowMeans(motttype_a_calc1, na.rm=TRUE))

motttype_c_calc1 <- select(df, c(N1a, N2a, N3a, N4a, E1a, E2a, E3a, E4a))
motttype_c1 = as.numeric(rowMeans(motttype_c_calc1, na.rm=TRUE))

motttype_m_calc1 <- select(df, c(A1a, A2a, A3a, A4a))
motttype_m1 <- as.numeric(rowMeans(motttype_m_calc1, na.rm=TRUE))

cols1 <- cbind(motttype_a1, motttype_c1, motttype_m1)
mot_type1a <- colnames(cols1)[max.col(cols1)]

df <- cbind(df, motttype_a1, motttype_c1, motttype_m1, mot_type1a)

# test for ties in autonomous v controlled motivation types
# Get rows where both values are equal and not NA
cols1_test <- df[, c("motttype_a1", "motttype_c1")]
tie_rows <- apply(cols1, 1, function(x) {
  if (all(!is.na(x))) {
    max_val <- max(x)
    sum(x == max_val) > 1 # TRUE if tie
  } else {
    FALSE
  }
})

# Store as a logical column
df$tied_mot1a <- tie_rows

# Or remove them entirely

```

```

df_no_ties <- df[!tie_rows, ]

tie_count <- sum(apply(cols1, 1, function(x) {
  if (all(!is.na(x))) {
    max_val <- max(x)
    sum(x == max_val) > 1
  } else {
    FALSE
  }
}))
sum(tie_count)

# TESTS FOR TIES BETWEEN MOTIVATION TYPES

# Get the relevant mean columns
mean_cols1 <- df[, c("ameans1", "emeans1", "nmeans1", "dmeans1", "imeans1")]

# Check each row for ties, ignoring NAs
tie_rows1 <- apply(mean_cols1, 1, function(x) {
  max_val1 <- max(x, na.rm = TRUE)
  sum(x == max_val1, na.rm = TRUE)
})

# Count how many rows have more than one type tied for the maximum score
num_ties1 <- sum(tie_rows1 > 1)

# Show result
num_ties1

# Function to identify tied motivation types
tie_combinations1 <- apply(mean_cols1, 1, function(x) {
  if (all(is.na(x))) return(NA) # If all are NA, skip
  max_val1 <- max(x, na.rm = TRUE)
  tied1 <- names(x)[which(x == max_val1)]
  if (length(tied1) > 1) {
    return(paste(sort(tied1), collapse = " & "))
  } else {
    return(NA) # No tie
  }
})

# Add tie combinations to the dataframe (optional)
df$tie_combination1 <- tie_combinations1

# Count how many unique tie combinations exist
table(tie_combinations1, useNA = "ifany")

### second round of data collection ###

avals2 <- select(df, c(A1b, A2b, A3b, A4b))
ameans2 <- rowMeans(avals2, na.rm=TRUE)

evals2 <- select(df, c(E1b, E2b, E3b, E4b))
emeans2 <- rowMeans(evals2, na.rm=TRUE)

nvals2 <- select(df, c(N1b, N2b, N3b, N4b))
nmeans2 <- rowMeans(nvals2, na.rm=TRUE)

dvals2 <- select(df, c(D1b, D2b, D3b, D4b))
dmeans2 <- rowMeans(dvals2, na.rm=TRUE)

```

```

ivals2 <- select(df, c(I1b, I2b, I3b, I4b))
imeans2 <- rowMeans(ivals2, na.rm=TRUE)

df <- cbind(df, amean2, emean2, nmean2, dmean2, imeans2)

meanonly2 <- select(df, c(amean1, emean2, nmean2, dmean2, imeans2))
set.seed(10)
mot_type2 <- colnames(meanonly2)[max.col(meanonly2)]

df <- cbind(df, mot_type2)

RAI2 <- ((-2*emean2) + (-1*nmean2) + (1*dmean2) + (2*imeans2))
round(RAI2, digits = 2)

df <- cbind(df, RAI2)

motype_a_calc2 <- select(df, c(I1b, I2b, I3b, I4b, D1b, D2b, D3b, D4b))
motype_a2 = as.numeric(rowMeans(motype_a_calc2, na.rm=TRUE))

motype_c_calc2 <- select(df, c(N1b, N2b, N3b, N4b, E1b, E2b, E3b, E4b))
motype_c2 = as.numeric(rowMeans(motype_c_calc2, na.rm=TRUE))

motype_m_calc2 <- select(df, c(A1b, A2b, A3b, A4b))
motype_m2 <- as.numeric(rowMeans(motype_m_calc2, na.rm=TRUE))

cols2 <- cbind(motype_a2, motype_c2, motype_m2)

mot_type1b <- colnames(cols2)[max.col(cols2)]

df <- cbind(df, mot_type1b)

# TESTS FOR TIES BETWEEN MOTIVATION TYPES

# Get the relevant mean columns
mean_cols2 <- df[, c("amean2", "emean2", "nmean2", "dmean2", "imeans2")]

# Check each row for ties, ignoring NAs
tie_rows2 <- apply(mean_cols2, 1, function(x) {
  max_val2 <- max(x, na.rm = TRUE)
  sum(x == max_val2, na.rm = TRUE)
})

# Count how many rows have more than one type tied for the maximum score
num_ties2 <- sum(tie_rows2 > 1)

# Show result
num_ties2

tie_combinations2 <- apply(mean_cols2, 1, function(x) {
  if (all(is.na(x))) return(NA) # If all are NA, skip
  max_val2 <- max(x, na.rm = TRUE)
  tied2 <- names(x)[which(x == max_val2)]
  if (length(tied2) > 1) {
    return(paste(sort(tied2), collapse = " & "))
  } else {
    return(NA) # No tie
  }
})

```

```

# Add tie combinations to the dataframe (optional)
df$tie_combination2 <- tie_combinations2

# Count how many unique tie combinations exist
table(tie_combinations2, useNA = "ifany")

### third round of data collection ###

avals3 <- select(df, c(A1c, A2c, A3c, A4c))
ameans3 <- rowMeans(avals3, na.rm=TRUE)

evals3 <- select(df, c(E1c, E2c, E3c, E4c))
emeans3 <- rowMeans(evals3, na.rm=TRUE)

nvals3 <- select(df, c(N1c, N2c, N3c, N4c))
nmeans3 <- rowMeans(nvals3, na.rm=TRUE)

dvals3 <- select(df, c(D1c, D2c, D3c, D4c))
dmeans3 <- rowMeans(dvals3, na.rm=TRUE)

ivals3 <- select(df, c(I1c, I2c, I3c, I4c))
imeans3 <- rowMeans(ivals3, na.rm=TRUE)

df <- cbind(df, amean3, emean3, nmean3, dmean3, imean3)

meanonly3 <- select(df, c(amean1, emean3, nmean3, dmean3, imean3))
set.seed(10)
mot_type3 <- colnames(meanonly3)[max.col(meanonly3)]

df <- cbind(df, mot_type3)

RAI3 <- ((-2*emean3) + (-1*nmean3) + (1*dmean3) + (2*imean3))
round(RAI3, digits = 2)

df <- cbind(df, RAI3)

motttype_a_calc3 <- select(df, c(I1c, I2c, I3c, I4c, D1c, D2c, D3c, D4c))
motttype_a3 = as.numeric(rowMeans(motttype_a_calc3, na.rm=TRUE))

motttype_c_calc3 <- select(df, c(N1c, N2c, N3c, N4c, E1c, E2c, E3c, E4c))
motttype_c3 = as.numeric(rowMeans(motttype_c_calc3, na.rm=TRUE))

motttype_m_calc3 <- select(df, c(A1c, A2c, A3c, A4c))
motttype_m3 <- as.numeric(rowMeans(motttype_m_calc3, na.rm=TRUE))

cols3 <- cbind(motttype_a3, motttype_c3, motttype_m3)

mot_type1c <- colnames(cols3)[max.col(cols3)]

df <- cbind(df, mot_type1c)

# TESTS FOR TIES BETWEEN MOTIVATION TYPES

# Get the relevant mean columns
mean_cols3 <- df[, c("amean3", "emean3", "nmean3", "dmean3", "imean3")]

# Check each row for ties, ignoring NAs
tie_rows3 <- apply(mean_cols3, 1, function(x) {
  max_val3 <- max(x, na.rm = TRUE)

```

```

    sum(x == max_val3, na.rm = TRUE)
  })

# Count how many rows have more than one type tied for the maximum score
num_ties3 <- sum(tie_rows3 > 1)

# Show result
num_ties3

tie_combinations3 <- apply(mean_cols3, 1, function(x) {
  if (all(is.na(x))) return(NA) # If all are NA, skip
  max_val3 <- max(x, na.rm = TRUE)
  tied3 <- names(x)[which(x == max_val3)]
  if (length(tied3) > 1) {
    return(paste(sort(tied3), collapse = " & "))
  } else {
    return(NA) # No tie
  }
})

# Add tie combinations to the dataframe (optional)
df$tie_combination3 <- tie_combinations3

# Count how many unique tie combinations exist
table(tie_combinations3, useNA = "ifany")

# TGAI calculations

tgvals1 <- df[,c("E5a", "N5a", "D5a", "I5a")] #selects the relevant columns
from df
tgai1 <- ((-2*df$E5a) + (-1*df$N5a) + (df$D5a) + (2*df$I5a))
round(tgai1, digits=2)

tgvals2 <- df[,c("E5b", "N5b", "D5b", "I5b")]
tgai2 <- ((-2*df$E5b) + (-1*df$N5b) + (df$D5b) + (2*df$I5b))
round(tgai2, digits=2)

tgvals3 <- df[,c("E5c", "N5c", "D5c", "I5c")]
tgai3 <- ((-2*df$E5c) + (-1*df$N5c) + (df$D5c) + (2*df$I5c))
round(tgai3, digits=2)

df <- cbind(df, tgai1, tgai2, tgai3)

# calculate mean values for each student for RAI and for TGAI

RAI_mean_calc <- select(df, c("RAI1", "RAI2", "RAI3"))
RAI_mean <- rowMeans(RAI_mean_calc, na.rm=TRUE)
df <- cbind(df, RAI_mean)

tgai_mean_calc <- select(df, c("tgai1", "tgai2", "tgai3"))
tgai_mean <- rowMeans(tgai_mean_calc, na.rm=TRUE)
df <- cbind(df, tgai_mean)

## motivation type counts

```

```

# define expected motivation categories
motivation_levels <- c("intrinsic", "identified", "introjected", "external",
"amotivated")

df$mot_type1 <- as.character(df$mot_type1)
df$mot_type2 <- as.character(df$mot_type2)
df$mot_type3 <- as.character(df$mot_type3)

# Replace codes with readable labels
df$mot_type1[df$mot_type1 == "dmeans1"] <- "identified"
df$mot_type1[df$mot_type1 == "imeans1"] <- "intrinsic"
df$mot_type1[df$mot_type1 == "emeans1"] <- "external"
df$mot_type1[df$mot_type1 == "nmeans1"] <- "introjected"
df$mot_type1[df$mot_type1 == "ameans1"] <- "amotivated"

df$mot_type2[df$mot_type2 == "dmeans2"] <- "identified"
df$mot_type2[df$mot_type2 == "imeans2"] <- "intrinsic"
df$mot_type2[df$mot_type2 == "emeans2"] <- "external"
df$mot_type2[df$mot_type2 == "nmeans2"] <- "introjected"
df$mot_type2[df$mot_type2 == "ameans2"] <- "amotivated"

df$mot_type3[df$mot_type3 == "dmeans3"] <- "identified"
df$mot_type3[df$mot_type3 == "imeans3"] <- "intrinsic"
df$mot_type3[df$mot_type3 == "emeans3"] <- "external"
df$mot_type3[df$mot_type3 == "nmeans3"] <- "introjected"
df$mot_type3[df$mot_type3 == "ameans3"] <- "amotivated"

count1 <- data.frame(mot_type1) # collects just first mot type
count1 <- df %>% filter(!is.na(mot_type1)) # cleans to remove NAs

df_proportion1 <- count1 %>% # whole block: provides counts and proportions
of each year group in each mot type
  group_by(year_group, mot_type1) %>%
  summarise(count = n(), .groups="drop") %>%
  group_by(year_group) %>%
  mutate(proportion = count / sum(count))
print("Motivation type counts and proportions by year group - first round:
"); df_proportion1

count2 <- data.frame(mot_type2) # collects just first mot type
count2 <- df %>% filter(!is.na(mot_type2)) # cleans to remove NAs

df_proportion2 <- count2 %>% # whole block: provides counts and proportions
of each year group in each mot type
  group_by(year_group, mot_type2) %>%
  summarise(count = n()) %>%
  group_by(year_group) %>%
  mutate(proportion = count / sum(count))
print("Motivation type counts and proportions by year group - second round:
"); df_proportion2

count3 <- data.frame(mot_type3) # collects just first mot type
count3 <- df %>% filter(!is.na(mot_type3)) # cleans to remove NAs

```

```

df_proportion3 <- count3 %>% # whole block: provides counts and proportions
of each year group in each mot type
  group_by(year_group, mot_type3) %>%
  summarise(count = n()) %>%
  group_by(year_group) %>%
  mutate(proportion = count / sum(count))
print("Motivation type counts and proportions by year group - third round:
"); df_proportion3

```

```

# chi square prelim test

```

```

# first data round
table_T1 <- table(df$year_group, df$mot_type1)
chisq.test(table_T1)

```

```

# second data round
table_T2 <- table(df$year_group, df$mot_type2)
chisq.test(table_T2)

```

```

# third data round
table_T3 <- table(df$year_group, df$mot_type3)
chisq.test(table_T3)

```

```

# this result (and use of Monte Carlo version of chi square showed no
significant diff between yr groups)

```

```

#### CHI SQUARE TESTS

```

```

# first data collection round

```

```

# create table for testing on
tie_table1 <- matrix(
  c(10, 8, 9,      # I
    155, 157, 158, # D
    75, 78, 72,    # N
    114, 108, 116, # E
    44, 47, 43),   # A
  nrow = 5,
  byrow = TRUE
)

```

```

rownames(tie_table1) <- c("Intrinsic", "Identified", "Introjected",
"External", "Amotivated")
colnames(tie_table1) <- c("Random Seed(1)", "Random Seed(28)", "Random
Seed(10)")

```

```

print(tie_table1)

```

```

#actual chi square test
chi_test1 <- chisq.test(tie_table1)

```

```

print(chi_test1)

```

```

# create table for testing on
tie_table2 <- matrix(
  c(4, 5, 6,      # I
    78, 80, 80,   # D
    51, 46, 49,   # N

```

```

        67, 58, 67,    # E
        42, 39, 40),  # A
    nrow = 5,
    byrow = TRUE
)

rownames(tie_table2) <- c("Intrinsic", "Identified", "Introjected",
"External", "Amotivated")
colnames(tie_table2) <- c("Random Seed(1)", "Random Seed(28)", "Random
Seed(10)")

print(tie_table2)

# second chi square test

chi_test2 <- chisq.test(tie_table2)

print(chi_test2)

# create table for testing on
tie_table3 <- matrix(
  c(4, 4, 5,    # I
    82, 88, 82,  # D
    53, 50, 54,  # N
    52, 48, 50,  # E
    32, 33, 32), # A
  nrow = 5,
  byrow = TRUE
)

rownames(tie_table3) <- c("Intrinsic", "Identified", "Introjected",
"External", "Amotivated")
colnames(tie_table3) <- c("Random Seed(1)", "Random Seed(28)", "Random
Seed(10)")

print(tie_table3)

# third chi square test

chi_test3 <- chisq.test(tie_table3)

print(chi_test3)

### VISUALISATIONS ### Combined

library(ggplot2)

# boxplots for RAI distributions - year groups on same axes but separate,
for each point in the year
ggplot(df, aes(x=year_group,
               y=RAI1,
               fill=year_group)) +
  stat_boxplot(geom = 'errorbar') +
  geom_boxplot(show.legend=FALSE,
               width=0.5) +
  scale_y_continuous(limits=c(-10,10)) +

```

```

    stat_summary(fun.y=mean, geom="point", shape=20, size=4, show.legend =
FALSE) +
    coord_flip()+
    labs(y = "Relative Autonomy Index - first SRQ-A",
         x = "Year Group")

```

```

ggplot(df, aes(x=year_group,
               y=RAI2,
               fill=year_group)) +
  stat_boxplot(geom = 'errorbar') +
  geom_boxplot(show.legend=FALSE,
               width=0.5) +
  scale_y_continuous(limits=c(-10,10)) +
  stat_summary(fun.y=mean, geom="point", shape=20, size=4, show.legend =
FALSE) +
  coord_flip()+
  labs(y = "Relative Autonomy Index - second SRQ-A",
       x = "Year Group")

```

```

ggplot(df, aes(x=year_group,
               y=RAI3,
               fill=year_group)) +
  stat_boxplot(geom = 'errorbar') +
  geom_boxplot(show.legend=FALSE,
               width=0.5) +
  scale_y_continuous(limits=c(-10,10)) +
  stat_summary(fun.y=mean, geom="point", shape=20, size=4, show.legend =
FALSE) +
  coord_flip()+
  labs(y = "Relative Autonomy Index - third SRQ-A",
       x = "Year Group")

```

boxplots for TGAI distributions - year groups on same axes but separate, for each point in the year

```

ggplot(df, aes(x=year_group,
               y=tgai1,
               fill=year_group)) +
  stat_boxplot(geom = 'errorbar') +
  geom_boxplot(show.legend=FALSE,
               width=0.5) +
  scale_y_continuous(limits=c(-10,10)) +
  stat_summary(fun.y=mean, geom="point", shape=20, size=4, show.legend =
FALSE) +
  coord_flip()+
  labs(y = "Target Grade Affinity Index - first SRQ-A",
       x = "Year Group")

```

```

ggplot(df, aes(x=year_group,
               y=tgai2,
               fill=year_group)) +
  stat_boxplot(geom = 'errorbar') +
  geom_boxplot(show.legend=FALSE,
               width=0.5) +
  scale_y_continuous(limits=c(-10,10)) +
  stat_summary(fun.y=mean, geom="point", shape=20, size=4, show.legend =
FALSE) +
  coord_flip()+

```

```

labs(y = "Target Grade Affinity Index - second SRQ-A",
     x = "Year Group")

ggplot(df, aes(x=year_group,
               y=tgai3,
               fill=year_group)) +
  stat_boxplot(geom = 'errorbar') +
  geom_boxplot(show.legend=FALSE,
               width=0.5) +
  scale_y_continuous(limits=c(-10,10)) +
  stat_summary(fun.y=mean, geom="point", shape=20, size=4, show.legend =
FALSE) +
  coord_flip()+
  labs(y = "Target Grade Affinity Index - third SRQ-A",
     x = "Year Group")

```

VISUALISATIONS ### separate with individual stats

split back into two different year groups to get per year group descriptive stats & vis

```

df10 <- df[df$year_group == "Year 10",] # replaces y10 original dataframe
with descriptive stats
df11 <- df[df$year_group == "Year 11",]

```

descriptive stats year group-wise

Year 10 RAI

```
print("YEAR 10 STATS")
```

```

print("mean value for RAI1 is"); mean(df10$RAI1, na.rm=TRUE)
print("standard deviation in RAI1 is:"); sd(df10$RAI1,na.rm=TRUE)
summary(df10$RAI1)

```

```

print("mean value for RAI2 is"); mean(df10$RAI2, na.rm=TRUE)
print("standard deviation in RAI2 is:"); sd(df10$RAI2,na.rm=TRUE)
summary(df10$RAI2)

```

```

print("mean value for RAI3 is"); mean(df10$RAI3, na.rm=TRUE)
print("standard deviation in RAI3 is:"); sd(df10$RAI3,na.rm=TRUE)
summary(df10$RAI3)

```

```

print("mean value for tgai1 is"); mean(df10$tgai1, na.rm=TRUE)
print("standard deviation in tgai1 is:"); sd(df10$tgai1,na.rm=TRUE)
summary(df10$tgai1)

```

```

print("mean value for tgai2 is"); mean(df10$tgai2, na.rm=TRUE)
print("standard deviation in tgai2 is:"); sd(df10$tgai2,na.rm=TRUE)
summary(df10$tgai2)

```

```

print("mean value for tgai3 is"); mean(df10$tgai3, na.rm=TRUE)
print("standard deviation in tgai3 is:"); sd(df10$tgai3,na.rm=TRUE)
summary(df10$tgai3)

```

Year 11 RAI

```

print("YEAR 11 STATS")
print("mean value for RAI1 is"); mean(df11$RAI1, na.rm=TRUE)
print("standard deviation in RAI1 is:"); sd(df11$RAI1,na.rm=TRUE)
summary(df11$RAI1)

print("mean value for RAI2 is"); mean(df11$RAI2, na.rm=TRUE)
print("standard deviation in RAI2 is:"); sd(df11$RAI2,na.rm=TRUE)
summary(df11$RAI2)

print("mean value for RAI3 is"); mean(df11$RAI3, na.rm=TRUE)
print("standard deviation in RAI3 is:"); sd(df11$RAI3,na.rm=TRUE)
summary(df11$RAI3)

print("mean value for tgai1 is"); mean(df11$tgai1, na.rm=TRUE)
print("standard deviation in tgai1 is:"); sd(df11$tgai1,na.rm=TRUE)
summary(df11$tgai1)

print("mean value for tgai2 is"); mean(df11$tgai2, na.rm=TRUE)
print("standard deviation in tgai2 is:"); sd(df11$tgai2,na.rm=TRUE)
summary(df11$tgai2)

print("mean value for tgai3 is"); mean(df11$tgai3, na.rm=TRUE)
print("standard deviation in tgai3 is:"); sd(df11$tgai3,na.rm=TRUE)
summary(df11$tgai3)

# frequency density plots for TGAI mean values for each year group
mean_value11 <- mean(df11$tgai_mean, na.rm = TRUE)

ggplot(df11, aes(x = tgai_mean)) +
  geom_histogram(bins=17, color = "white", fill = "purple4", alpha = 0.7) +
  geom_vline(aes(xintercept = mean_value11), color = "black", linetype =
"dashed", linewidth = 1) +
  xlim(-8,8) +
  ylim(0,100) +
  labs(x = "Mean Target Grade Affinity Index (Year 11 Students)", y =
"Density")

mean_value10 <- mean(df10$tgai_mean, na.rm = TRUE)

ggplot(df10, aes(x = tgai_mean)) +
  geom_histogram(bins=17, color = "white", fill = "purple4", alpha = 0.7) +
  geom_vline(aes(xintercept = mean_value11), color = "black", linetype =
"dashed", linewidth = 1) +
  xlim(-8,8) +
  ylim(0,100) +
  labs(x = "Mean Target Grade Affinity Index (Year 10 Students)", y =
"Density")

### INFERENCE STATISTICS ###
# per year group, not combined - use the new separated DFs

# test for normality (Shapiro-Wilk, skew, excess kurtosis) by year group for
RAI mean and TGAI mean

library(psych)
library(moments)

shapiro.test(df11$RAI_mean)

```

```

skew(df11$RAI_mean) # inherently ignores NA values
kurtosis(df11$RAI_mean, na.rm=TRUE)-3 # needs to be told to remove NAs from
calculation

# all four Q-Q plots help to visualise the normality of data. Expect points
to mostly fall on the trendline
# for normal data
qqnorm(df11$RAI_mean,
      xlab = "Theoretical Quantiles - Y11 RAI mean")
qqline(df11$RAI_mean, col="red")

# produces histogram of mean RAI distribution for Year 11 (to go in the
Appendices)
ggplot(df11, aes(x = RAI_mean)) +
  geom_histogram(bins=20, color = "white", fill = "green4", alpha = 0.7) +
  geom_vline(aes(xintercept = mean(df11$RAI_mean, na.rm = TRUE)), color =
"black", linetype = "dashed", linewidth = 1) +
  xlim(-9,9) +
  ylim(0,50) +
  labs(x = "Mean RAI Distribution (Year 11 Students)", y = "Density")

shapiro.test(df11$tgai_mean)
skew(df11$tgai_mean)
kurtosis(df11$tgai_mean, na.rm=TRUE)-3

qqnorm(df11$tgai_mean,
      xlab = "Theoretical Quantiles - Y11 TGAI mean")
qqline(df11$tgai_mean, col="red")

shapiro.test(df10$RAI_mean)
skew(df10$RAI_mean)
kurtosis(df10$RAI_mean, na.rm=TRUE)-3

qqnorm(df10$RAI_mean,
      xlab = "Theoretical Quantiles - Y10 RAI mean")
qqline(df10$RAI_mean, col="red")

# produces histogram of mean RAI distribution for Year 10 (to go in the
Appendices)
ggplot(df10, aes(x = RAI_mean)) +
  geom_histogram(bins=20, color = "white", fill = "green4", alpha = 0.7) +
  geom_vline(aes(xintercept = mean(df10$RAI_mean, na.rm = TRUE)), color =
"black", linetype = "dashed", linewidth = 1) +
  xlim(-9,9) +
  ylim(0,50) +
  labs(x = "Mean RAI Distribution (Year 10 Students)", y = "Density")

shapiro.test(df10$tgai_mean)
skew(df10$tgai_mean)
kurtosis(df10$tgai_mean, na.rm=TRUE)-3

qqnorm(df10$tgai_mean,
      xlab = "Theoretical Quantiles - Y10 TGAI mean")
qqline(df10$tgai_mean, col="red")

# Spearman Rank Correlation Coefficients

print("Year 11 then year 10 correlation TGAI vs mean targets")

```

```

cor(df11$mean_target, df11$tgai_mean, use = "pairwise.complete.obs",
method="spearman")
cor(df10$mean_target, df10$tgai_mean, use = "pairwise.complete.obs",
method="spearman")

# year 10 scatter plot with LOBF to visualise mean targets vs mean TGAI
ggplot(df10, aes(tgai_mean, mean_target)) +
  geom_point(alpha=0.5) +
  geom_smooth(method="lm", se=FALSE) +
  labs(x = "Mean Target Grade Affinity Index (Y10)", y = "Mean Target Grade
(all subjects)")

# year 11 scatter plot with LOBF to visualise mean targets vs mean TGAI
ggplot(df11, aes(tgai_mean, mean_target)) +
  geom_point(alpha=0.5) +
  geom_smooth(method="lm", se=FALSE) +
  labs(x = "Mean Target Grade Affinity Index (Y11)", y = "Mean Target Grade
(all subjects)")

print("Year 11 then year 10 correlation TGAI vs RAI")
cor(df11$RAI_mean, df11$tgai_mean, use="pairwise.complete.obs",
method="spearman")
cor(df10$RAI_mean, df10$tgai_mean, use="pairwise.complete.obs",
method="spearman")

# cor point 1
cor(df11$RAI1, df11$tgai1, use="pairwise.complete.obs", method="spearman")
cor(df10$RAI1, df10$tgai1, use="pairwise.complete.obs", method="spearman")

# cor point 2
cor(df11$RAI2, df11$tgai2, use="pairwise.complete.obs", method="spearman")
cor(df10$RAI2, df10$tgai2, use="pairwise.complete.obs", method="spearman")

# cor point 3
cor(df11$RAI3, df11$tgai3, use="pairwise.complete.obs", method="spearman")
cor(df10$RAI3, df10$tgai3, use="pairwise.complete.obs", method="spearman")

# year 10 scatter plot with LOBF to visualise RAI vs mean TGAI
ggplot(df10, aes(y = tgai_mean, x = RAI_mean)) +
  geom_point(alpha=0.5) +
  geom_smooth(method="lm", se=FALSE) +
  scale_y_continuous(limits=c(-10,10)) +
  labs(x = "Mean RAI values", y = "Mean Target Grade Affinity Index (Y10)")

ggplot(df11, aes(y = tgai_mean, x = RAI_mean)) +
  geom_point(alpha=0.5) +
  geom_smooth(method="lm", se=FALSE) +
  scale_y_continuous(limits=c(-10,10)) +
  labs(x = "Mean RAI values", y = "Mean Target Grade Affinity Index (Y10)")

# Linear regressions (for each year group: single regressions x2, and
multiple regression x1)

modell1a <- lm(tgai_mean ~ RAI_mean, df11)
summary(modell1a)

modell1b <- lm(tgai_mean ~ RAI_mean, df10)

```

```

summary(model1b)

model2a <- lm(tgai_mean ~ mean_target, df11)
summary(model2a)

model2b <- lm(tgai_mean ~ mean_target, df10)
summary(model2b)

model3a <- lm(tgai_mean ~ RAI_mean + mean_target, df10)
summary(model3a)

model3b <- lm(tgai_mean ~ RAI_mean + mean_target, df11)
summary(model3b)

# t-tests for dependent means
# remove NA values and store in subsetting data frames

# Year 10 RAI
df10_nona13 <- df10[!is.na(df10$RAI1)&!is.na(df10$RAI3),] # removes any RAI1
or RAI3 rows with NAs in them
df10_nona12 <- df10[!is.na(df10$RAI1)&!is.na(df10$RAI2),] # removes any RAI1
or RAI2 rows with NAs in them
df10_nona23 <- df10[!is.na(df10$RAI2)&!is.na(df10$RAI3),] # removes any RAI1
or RAI3 rows with NAs in them

#Year 11 RAI
df11_nona13 <- df11[!is.na(df11$RAI1)&!is.na(df11$RAI3),] # removes any RAI1
or RAI3 rows with NAs in them
df11_nona12 <- df11[!is.na(df11$RAI1)&!is.na(df11$RAI2),] # removes any RAI1
or RAI2 rows with NAs in them
df11_nona23 <- df11[!is.na(df11$RAI2)&!is.na(df11$RAI3),] # removes any RAI1
or RAI3 rows with NAs in them

# Year 10 TGAI
df10_nona13t <- df10[!is.na(df10$tgai1)&!is.na(df10$tgai3),] # removes any
tgai1 or tgai3 rows with NAs in them
df10_nona12t <- df10[!is.na(df10$tgai1)&!is.na(df10$tgai2),] # removes any
tgai1 or tgai2 rows with NAs in them
df10_nona23t <- df10[!is.na(df10$tgai2)&!is.na(df10$tgai3),] # removes any
tgai1 or tgai3 rows with NAs in them

# Year 11 TGAI
df11_nona13t <- df11[!is.na(df11$tgai1)&!is.na(df11$tgai3),] # removes any
tgai1 or tgai3 rows with NAs in them
df11_nona12t <- df11[!is.na(df11$tgai1)&!is.na(df11$tgai2),] # removes any
tgai1 or tgai2 rows with NAs in them
df11_nona23t <- df11[!is.na(df11$tgai2)&!is.na(df11$tgai3),] # removes any
tgai1 or tgai3 rows with NAs in them

# TGAI between each point for Year 10
hyp_test_10.13t <- t.test(df10_nona13t$tgai1,
                        df10_nona13t$tgai3,
                        alternative="greater",
                        mu=0,
                        paired=TRUE)

hyp_test_10.12t <- t.test(df10_nona12t$tgai1,
                        df10_nona12t$tgai2,
                        alternative="greater",

```

```

mu=0,
paired=TRUE)

hyp_test_10.23t <- t.test(df10_nona23t$tgai2,
                        df10_nona23t$tgai3,
                        alternative="greater",
                        mu=0,
                        paired=TRUE)

# TGAI between each point for Year 11

hyp_test_11.13t <- t.test(df11_nona13t$tgai1,
                        df11_nona13t$tgai3,
                        alternative="greater",
                        mu=0,
                        paired=TRUE)

hyp_test_11.12t <- t.test(df11_nona12t$tgai1,
                        df11_nona12t$tgai2,
                        alternative="greater",
                        mu=0,
                        paired=TRUE)

hyp_test_11.23t <- t.test(df11_nona23t$tgai2,
                        df11_nona23t$tgai3,
                        alternative="greater",
                        mu=0,
                        paired=TRUE)

# RAI between each point for Year 10

hyp_test_10.13r <- t.test(df10_nona13$RAI1,
                        df10_nona13$RAI3,
                        alternative="greater",
                        mu=0,
                        paired=TRUE)

hyp_test_10.12r <- t.test(df10_nona12$RAI1,
                        df10_nona12$RAI2,
                        alternative="greater",
                        mu=0,
                        paired=TRUE)

hyp_test_10.23r <- t.test(df10_nona23$RAI2,
                        df10_nona23$RAI3,
                        alternative="greater",
                        mu=0,
                        paired=TRUE)

# RAI between each point for Year 11

hyp_test_11.13r <- t.test(df11_nona13$RAI1,
                        df11_nona13$RAI3,
                        alternative="greater",
                        mu=0,
                        paired=TRUE)

hyp_test_11.12r <- t.test(df11_nona12$RAI1,
                        df11_nona12$RAI2,
                        alternative="greater",
                        mu=0,
                        paired=TRUE)

```

```

hyp_test_11.23r <- t.test(df11_nona23$RAI2,
                        df11_nona23$RAI3,
                        alternative="greater",
                        mu=0,
                        paired=TRUE)

print("t-test for Y11 TGAI between points 1-3: "); hyp_test_11.13t
print("t-test for Y11 TGAI between points 1-2: "); hyp_test_11.12t
print("t-test for Y11 TGAI between points 2-3: "); hyp_test_11.23t

print("t-test for Y10 TGAI between points 1-3: "); hyp_test_10.13t
print("t-test for Y10 TGAI between points 1-2: "); hyp_test_10.12t
print("t-test for Y10 TGAI between points 2-3: "); hyp_test_10.23t

print("t-test for Y11 RAI between points 1-3: "); hyp_test_11.13r
print("t-test for Y11 RAI between points 1-2: "); hyp_test_11.12r
print("t-test for Y11 RAI between points 2-3: "); hyp_test_11.23r

print("t-test for Y10 RAI between points 1-3: "); hyp_test_10.13r
print("t-test for Y10 RAI between points 1-2: "); hyp_test_10.12r
print("t-test for Y10 RAI between points 2-3: "); hyp_test_10.23r

## change in motivation type - Stuart-Maxwell tests

install.packages("DescTools")
library(DescTools)

cont_table12.10 <- table(df10$mot_type1, df10$mot_type2) # these create
contingency tables showing students that associated ...
cont_table23.10 <- table(df10$mot_type2, df10$mot_type3) # with each
motivation type in SRQA 1, and then how ...
cont_table13.10 <- table(df10$mot_type1, df10$mot_type3) # that student
associated with mot type in SRQA 2 etc

StuartMaxwellTest(cont_table12.10)
StuartMaxwellTest(cont_table23.10)
StuartMaxwellTest(cont_table13.10)

cont_table12.11 <- table(df11$mot_type1, df11$mot_type2) # same as above but
for Y11
cont_table23.11 <- table(df11$mot_type2, df11$mot_type3)
cont_table13.11 <- table(df11$mot_type1, df11$mot_type3)

StuartMaxwellTest(cont_table12.11)
StuartMaxwellTest(cont_table23.11)
StuartMaxwellTest(cont_table13.11)

### TESTS FOR INTERNAL CONSISTENCY ###

install.packages("ltm")
library(ltm)

# in this order for each block: external / introjected / identified /
intrinsic / amotivated

```

```

# Y10 Round 1
cronbach.alpha(df10[,3:7], na.rm=TRUE)
cronbach.alpha(df10[,8:12], na.rm=TRUE)
cronbach.alpha(df10[,13:17], na.rm=TRUE)
cronbach.alpha(df10[,18:22], na.rm=TRUE)
cronbach.alpha(df10[,23:27], na.rm=TRUE)

# Y10 Round 2
cronbach.alpha(df10[,28:32], na.rm=TRUE)
cronbach.alpha(df10[,33:37], na.rm=TRUE)
cronbach.alpha(df10[,38:42], na.rm=TRUE)
cronbach.alpha(df10[,43:47], na.rm=TRUE)
cronbach.alpha(df10[,48:52], na.rm=TRUE)

# Y10 Round 3
cronbach.alpha(df10[,53:57], na.rm=TRUE)
cronbach.alpha(df10[,58:62], na.rm=TRUE)
cronbach.alpha(df10[,63:67], na.rm=TRUE)
cronbach.alpha(df10[,68:72], na.rm=TRUE)
cronbach.alpha(df10[,73:77], na.rm=TRUE)


# in this order for each block: external / introjected / identified /
intrinsic / amotivated

# Y11 Round 1
cronbach.alpha(df11[,3:7], na.rm=TRUE)
cronbach.alpha(df11[,8:12], na.rm=TRUE)
cronbach.alpha(df11[,13:17], na.rm=TRUE)
cronbach.alpha(df11[,18:22], na.rm=TRUE)
cronbach.alpha(df11[,23:27], na.rm=TRUE)

# Y11 Round 2
cronbach.alpha(df11[,28:32], na.rm=TRUE)
cronbach.alpha(df11[,33:37], na.rm=TRUE)
cronbach.alpha(df11[,38:42], na.rm=TRUE)
cronbach.alpha(df11[,43:47], na.rm=TRUE)
cronbach.alpha(df11[,48:52], na.rm=TRUE)

# Y11 Round 3
cronbach.alpha(df11[,53:57], na.rm=TRUE)
cronbach.alpha(df11[,58:62], na.rm=TRUE)
cronbach.alpha(df11[,63:67], na.rm=TRUE)
cronbach.alpha(df11[,68:72], na.rm=TRUE)
cronbach.alpha(df11[,73:77], na.rm=TRUE)

```