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Great Grade Expectations? The Role of Pupil Expectations in Target Setting

Thomas Perry[1], Peter Davies and Tian Qiu

School of Education,
University of Birmingham,
Edgbaston,
Birmingham.
B15 2TT, UK

[1] *Corresponding author*
Address as above
Tel: +44 7816 55 8540

Abstract

This paper examines the relationship between pupils' expectations of their grades in public examinations at age 16 in England and their actual grades. We define optimism as the difference between grades expected by pupils and grades predicted by pupils' prior attainment and background. We define accuracy as the difference between pupils' grade expectations and the actual grades achieved. Using data from 5507 pupils and 50 schools, we find that more optimistic expectations are associated with higher value-added, even where expectations far exceed statistical predictions and actual grades. Each extra grade expected predicts average higher value-added of about a third of a grade. We also examine the correlates of pupil optimism and expectation accuracy, finding some evidence for school effects.

Key words: pupil progress; self-efficacy; grade expectations; pupil targets

1. Targets, expectations and academic achievement

Using data from 5507 Year 11 (age 15-16) pupils from 50 English secondary schools, we examined relationships between the accuracy and optimism of pupils' expectations of examination grades and the grades they actually achieved. Pupil performance was evaluated using a contextualised value-added measure which captured differences in attainment after controlling for prior attainment and other pupil personal and socio-economic characteristics. We also examined inter-school variation in optimism, thereby providing indicative evidence about the extent to which schools influence these relationships. These relationships matter for how schools respond to policies and guidance pertaining to setting targets for pupils' attainment (see for examples Muller and Associates, 2001; Davies, Coates, Hammersley-Fletcher, & Mangan, 2005; DfE, 2012; Ofsted, 2013a). Pupils in England are expected to know their target grades and inspectors commend institutions when pupils are involved in setting targets (see for example DCSF, 2008; Ofsted, 2013b). A large survey of secondary schools in England (Kelly, Downey, & Rietdijk, 2010) found that over 95% of school staff reported that they were using pupil attainment data and 80-93% of staff claimed that they

used data to set targets for individual pupils. It is, therefore, likely that the majority of the pupils in this study experienced some form of implementation of target setting. One question for this policy is whether target setting is something that is 'done to pupils' or a process through which schools engage with, and seek to nurture, pupils' own expectations. Our results offer some support to the second of these alternatives. In particular, teachers may either encourage pupils to become more accurate or more optimistic in their expectations. Our results encourage fostering optimism.

2. The agency of the learner: realistic and optimistic expectations

In this section, we briefly review evidence from two research programmes which bear upon the design of this study and the benefits of optimistic versus realistic expectations. First, we review studies of the relationship between self-belief constructs such as self-efficacy and future academic attainment before turning to the relationship between the accuracy of predictions of task success and actual task performance. Previous research has rarely considered these perspectives side-by-side.

2.1 Optimistic expectations

The 'target setting' agenda encourages English schools to promote high expectations in pupils' beliefs about the grades they could achieve. A key rationale for this is provided by evidence of positive associations between academic self-concept or self-efficacy and subsequent academic achievement. 'Academic self-concept' and 'self-efficacy' offer theoretical bases for encouraging optimistic expectations (Bong, Cho, Ahn, & Kim, 2012; Ferla, Valcke, & Cai, 2009; Morony, Kleitman, Lee, & Stankov, 2013; Parker, Marsh, Ciarrochi, Marshall, & Abduljabbar, 2014). These constructs offer reciprocal models of the relationship between self-beliefs and achievement (Zimmerman, Bandura, & Martinez-Pons, 1992; Bong & Skaalvik, 2003; Fraine, Damme, & Onghena, 2007; Van de gaer et al., 2009).

Accounts of academic self-concept tend to foreground the role of perceived ability in a subject domain, formed through comparison of oneself with the attainment of peers (Jansen, Schroeders, & Lüdtke, 2014; Wouters, De Fraine, Colpin, Van Damme, & Verschueren, 2012). Self-efficacy on the other hand is a "belief that one can successfully carry out the tasks and behaviours necessary to reach a designated level of academic achievement" (Bong, 2013, p. 64). Self-efficacy foregrounds adaptive responses to experience of mastering tasks which are moderated through social persuasion by credible others and modelling of task achievement by peers. It offers a rationale for setting goals that are specific and optimistic to raise achievement through increases in motivation, effort and persistence (Coe, 2013; Hattie & Timperley, 2007; Mento, Steel, & Karren, 1987).

As it is more focused on task mastery, self-efficacy is more closely aligned than academic self-concept with the policy expectations that schools can raise achievement by encouraging high pupil self-beliefs. Whilst broad definitions of achievement within a subject domain resonate more closely with academic self-concept, expectations of examination grades are task orientated and more closely associated with self-efficacy. There is considerable overlap between the two constructs, however, especially in the context of beliefs pertaining to expectations of examination grades in the medium to long term. Such links have

been emphasised in recent research linking self-efficacy with, on one hand, mastery experiences, praise (social persuasion) and peer comparisons, but also perceptions of what constitutes a 'good' grade (mastery norms) and subjective values such as the utility of the subject (Sheldrake, 2016).

Both theoretical perspectives predict that high pupil self-beliefs will raise achievement, although much of this evidence stops short of demonstrating causal effects (Gorard, See & Davies, 2011). Researchers consistently report positive associations between self-efficacy and subsequent academic attainment (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Multon, Brown, & Lent, 1991; Stankov & Lee, 2014; Zimmerman, 2000). There is a smaller but growing body of evidence showing a positive but smaller association between academic self-concept and subsequent academic attainment (Parker et al., 2014).

Researchers have reported systematic variation in pupils' academic self-beliefs by sex (Marsh, Relich & Smith, 1983; Davies, Mangan & Telhaj, 2005; Kleitman & Gibson, 2011), socio-economic status (Hoy, Tarter & Hoy, 2006) and ethnicity (e.g. Goyette & Xie, 1999). These studies predict that the attainment of boys, Asian pupils and pupils with professional or managerial parents will be boosted by relatively higher levels of self-belief. These socio-economic and ethnicity effects may be influenced by the relative importance of school grades to pupils' life-course aspirations (as suggested, for example, by status attainment theory). We might, therefore, expect to find that pupils who aspire to higher education are more optimistic in their grade predictions, although, as far as we are aware, previous research has not examined this relationship.

School effects on pupils' self-belief may operate either through the composition of a school's intake or through the development of a school culture which emphasises academic achievement and encourages teachers to trust pupils and parents whilst developing 'collective efficacy' (Hoy, Tarter & Hoy, 2006). This model suggests that attending a private school will be positively associated with more optimistic expectations about examination grades. Goldsmith (2004) found that pupils from minority ethnic groups more optimistic about their academic progress if they are taught in a school in which their ethnic group is more strongly represented amongst teachers and pupils. Two studies carried out with large samples of secondary school pupils in Belgium (Fraine et al., 2007; Van de gaer et al., 2009) found modest positive school-level associations between academic self-concept and attainment. Whilst they found that intake composition accounted for a large part of the school effect, their results are consistent with the model put forward by Hoy and colleagues.

2.2 Realistic Expectations

Support for target setting in English schools[i] emphasises the importance of 'appropriate' targets that reflect a realistic prediction of what a pupil could achieve. A realistic prediction is one that seeks to maximise *ex post* accuracy using the information available *ex ante* (see below). In schooling systems with regular assessment of pupils (as in England), pupils are likely to have good information about their past attainment and they know how much interest they have in a subject. So, although a pupil's knowledge will be imperfect, there is some basis for believing they could make a broadly realistic judgement about future grades. Realism in this *ex ante* context involves a comparison between a pupil's grade expectations and what might be reasonably predicted on the basis of evidence of their prior attainment.

This can be distinguished from *ex post* accuracy or calibration (Alexander, 2013) which compares a pupil's expectation with the grades they actually achieve. Previous research on the accuracy of pupils' grade expectations (Sullivan, 2006; Attwood, Croll, Fuller, & Last, 2013) has used *ex post* comparisons of expectations and grades achieved. Using fairly small samples these studies suggested that pupils overestimated grades by an average of between 0.3 and 0.7 per subject and that pupils expecting lower grades made less accurate predictions. *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 (Ofsted, 2011). Realistic expectations may be advocated on the basis that either low or over-optimistic expectations discourage the effort and engagement of pupils and teachers (e.g. Rubie-Davies, Hattie & Hamilton, 2006; Sheldrake, 2016). Realistic predictions may also be viewed as desirable from the perspective of the construction of pupils' understanding as suggested, for example, by Vygotsky's 'zone of proximal development' (ZPD) (Tharp & Gallimore, 1991).

The ZPD depicts progress that is realistic to expect given a pupil's initial understanding. Teaching will fail if it expects a pupil to take three steps when they can only take two. Studies of assessment for learning report strong benefits for pupils' achievement (Black & Wiliam, 1998; Davies, Durbin, Clarke, & Dale, 2004; Loibl & Rummel, 2014; McDonald & Boud, 2003; Wiliam, 2011). Moreover, evidence from studies with school pupils (e.g. Ots, 2013) and university pupils (Buckelew, Byrd, Key, Thornton, & Merwin, 2013; Hacker, Bol, Horgan, & Rakow, 2000) indicates that higher achieving pupils tend to make more accurate predictions of their performance on future tasks, suggesting a virtuous circle between realistic expectations (that prove to be accurate) and task performance. The implication is that pupils who make realistic assessments of their current understanding and their future achievement are likely to make better progress than their peers.

However, teaching also fails the pupil if it does not enable progress to reach close to the ZPD's frontier. An *ex ante* grade prediction is an average calculated from the attainment of previous pupils. Some of these attainments will have been affected by sub-optimal teaching and learning). Therefore, whilst the *ex ante* grade prediction provides a benchmark of reasonable progress, it does not inform a pupil or a teacher about the maximum progress which might be possible. A further complication is that the progress a pupil may make is determined in this framework not only by the pupil's starting point, but also their capacity to learn (the width of their ZPD). Pupils' capacity to learn will be affected by awareness of: their current conceptions (Locke & Latham, 1990; Smith, 2009), their understanding of their own learning process and progress (Dunlosky & Thiede, 2013; Hattie, 2013), their epistemological beliefs (Trautwein, & Lüdtke, 2007) and their emerging grasp of a subject's 'episteme' (Mason, Boscolo, Tornatora, & Ronconi, 2013; Perkins, 2006). When a pupil grasps the underlying way of thinking and practising in a subject (the episteme) they can more quickly make sense of ways in which problems are defined and addressed.

2.3 Expectations and Attainment

The literatures on self-beliefs and accuracy of expectations raises questions about the relationships between the optimism of expectations, accuracy of expectations and attainment.

Interventions to foster optimism about future achievement without any consideration of their impact on accuracy are called into question by the strong evidence that most pupils over-estimate future grades and that this over-estimation is remarkably steady in the face of conflicting evidence (Anderson, Brion, Moore, & Kennedy, 2012; Bouffard, Vezeau, Roy, & Lengelé, 2011; Butler, 2011; Chevalier, Gibbons, Thorpe, Snell, & Hoskins, 2009; Hossain & Tsigaris, 2015; Schraw, 2009; Sullivan, 2006). Boys and pupils from high socio-economic backgrounds are reported as tending to have a more strongly upward bias in their expectations. This evidence raises the possibility that some pupils might be *too* optimistic about their future attainment.

Highly optimistic expectations which have become detached from a sense of the effort required for their fulfilment have been termed 'blissful incompetence' or 'positive future fantasies'. They are positively associated with pupil absence, lower grades and lower effort levels (Kappes, Oettingen, & Mayer, 2012; Miller & Geraci, 2011). For many individuals, therefore, fostering optimism may be redundant or even damaging when this optimism is 'uninformed optimism' (Svanum & Bigatti, 2006). In addition, there is evidence to suggest that setting goals which are overly-optimistic can be detrimental to achievement. Förster and Souvignier (2014) found that children who were asked to regularly set goals for their reading achievement and received feedback on their progress made *less* progress than children who only received feedback on their progress. Moreover, children in the goal-setting group were found to have a lower self-concept for reading at the end of the intervention. Förster and Souvignier (2014, p. 98) note that these unexpected negative effects of goal setting may have arisen where pupils 'have difficulties in experiencing progress', were 'overstrained by the task' or struggled to interpret and attribute their successes and failures in a way which enhanced self-belief.

The evidence is mixed on whether high expectations and other positive self-beliefs are beneficial when these are unrealistic and to the detriment of accuracy (Dupeyrat, Escribe, Huet, & Régner, 2011; Sheldrake, 2016). There are very few examples of studies that have considered the merits of optimism versus realism side by side in relation to expectations for future attainment. Investigating the relationship between optimism and realism in grade expectations requires a procedure for estimating 'realistic expectations' (Butler, 2011; Kim, Chiu, & Zou, 2010). Suppose Pupil X expects a grade A and achieves a grade A and Pupil Y expects a grade C and achieves a grade C; whilst we could say that both were accurate, we cannot tell whether either were optimistic, realistic or pessimistic in their initial expectations. A judgement of optimism rests on a prediction of reasonable expectations (e.g. on the basis of past attainment). If, on this basis, we would have predicted that both pupils would get a grade B, we are able to say that Pupil X was optimistic and Pupil Y was pessimistic. Most previous studies have not been able to distinguish between expectations in this way (Kim et al., 2010).

In a rare study which examined the link between optimistic and realistic expectations and subsequent attainment, Svanum and Bigatti (2006) investigated the expectations of 258 US college pupils. They distinguish between 'uninformed wishfulness' (unrealistic optimism) and 'informed aspirational judgment' (realistic optimism). They found that course grade expectations were positively associated with actual grades achieved after controlling for prior attainment, whilst self-reported effort was not associated with grade achieved after controlling for prior achievement. They also found that lower performing pupils were less

realistic in their grade expectations such that their expectations were more likely to be characterised as 'uninformed wishfulness'.

3. Method

3.1 Research Questions and Hypotheses

To recap, we have reviewed evidence from two programmes of research: the first finds positive associations between academic attainment and self-belief constructs such as self-efficacy and self-concept. It encourages high expectations. The second area reviewed, relating to accuracy of expectations, emphasises the value of pupils' ability to make realistic assessments of their current and likely future achievement. In both areas, we have discussed variation in self-belief constructs by pupil characteristics, background and how these link to academic attainment, school composition and policies such as target setting. We then considered how the two literatures relate and noted that there are few examples of studies which consider what we refer to as optimism and realism (i.e. *ex ante* grade expectations compared to reasonable expectations based on prior attainment) side by side. We set out to examine grade expectations in relation to both contextualised value-added (i.e. attainment after adjusting for prior attainment and other contextual factors) and accuracy through the following research questions. These correspond to results Sections 4.1 to 4.5 respectively.

(1) Are pupils realistic in their grade expectations?
(2) What are the pupil- and school-level correlates of pupil optimism and inaccuracy?
(3) Is there evidence for a school effect on the optimism of pupil grade expectations?
(4) Are pupil grade expectations predictive of value-added performance?
(5) What is the relationship between optimism and value added?

Note that optimism refers to high grade expectations in relation to reasonable expectations based on prior attainment and characteristics (see Section 2.3 above for explanation and Section 3.3 below for how reasonable expectations are calculated in this study). We examined six propositions (1-6, below) that have been suggested by previous studies (example studies are given). We examined three further propositions (7-9) suggested by our interpretation of previous literature.

(1) On average, pupils will over-estimate examination grades by between 0.3 and 0.7 of a grade.
(2) Pupils expecting lower grades will be less accurate in their predictions.
(3) Boys and non-white pupils will be more optimistic in their grade expectations.
(4) Socio-economic background will be strongly related to grade optimism
(5) Pupils' optimism about grades will be domain-specific
(6) Schools account for a modest proportion of the variation in pupils' grade optimism
(7) Intention to go to university will be positively associated with optimism in grade expectations
(8) Attending a private school will be positively associated with optimistic grade expectations

(9) There will be a non-linear relationship between optimism in grade expectations and actual achievement. Optimism will cease to exert a positive effect on attainment when it drifts into over-estimation

Propositions 3, 4, 7 and 8 arise from the expectation that socio-economic background in general (and status attainment in particular) will affect pupils' engagement with schooling and the extent to which they expect attainment in examinations to affect the achievement of their aspirations. Propositions 6 and 8 arise from theory (Hoy, Tarter & Hoy, 2006) and policy (DfE, 2012, Ofsted, 2013b) regarding school effects on pupils' expectations. Proposition 9 is prompted by our interpretations of the literatures on optimism and accuracy in pupils' attainment expectations.

3.2 Sample and Descriptive Statistics

The data used in this study were collected as part of a project investigating pupils' expectations and decision-making in English secondary schools (Davies, Davies & Qiu, 2014). English secondary schools typically take pupils from Year 7 (age 11-12) to either Year 11 (age 15-16) or Year 13 (age 17-18). In the Summer term in Year 11, all pupils in England sit for 'General Certificate of Secondary Education' (GCSE) examinations. In the original project, schools were asked to issue a questionnaire to all Year 11 pupils in the Autumn term of 2011. The questionnaire gathered data on pupils' characteristics and background (see Table 1, below). These data included items forming a cultural capital measure, with sets of questions relating to i) books in the home, ii) engagement with parents regarding school work and iii) participation in different cultural activities (see Davies, Davies & Qiu, 2014). Questionnaire data allowed a wide range of confounding factors to be controlled when evaluating pupil attainment and examination of how socio-economic background and cultural capital are associated with pupil grade expectations. The questionnaire data were supplemented with evidence of prior attainment and pupils' background characteristics collected through the National Pupil Database (NPD) which contains attainment and census data for all pupils in state-funded schools in England (about 93% of all pupils). For the present study, we obtained the GCSE results from the Summer 2012 examinations from the NPD and matched these to the original survey and NPD data.

Our final dataset included a rich range of indicators of pupil characteristics and attainment data collected at the end of Key Stage 2 (KS2, age 11, usually collected in the final year of a separate primary school), Key Stage 3 (KS3, age 14) and Key Stage 4 (KS4, age 16, when the GCSE exams are taken) (see Table 1, below). It did not however include standard items to measure pupils' self-efficacy in relation to English and maths, aside from their expected GCSE grades in these subjects. Pupils' expectations were provided by their responses to the question 'What grades do you expect to get for GCSE [English, mathematics]?'

The sample was designed to focus on pupils aiming to continue in school education after age 16 whilst minimising unobservable selection bias. We report survey responses from 5,507 pupils attending 50 secondary schools. The schools are not representative of all schools in England as the sample was selected to exclude schools with less than 100 pupils in the age group 16-18 (to facilitate analysis of decisions over the transition in English schools at age

16) and to include 20 (non-state-funded) private schools. 32% of pupils in the sample attended private schools compared to a national average of approximately 7%. Subject to these selection criteria the project recruited a random selection of schools from a geographical area which included more than half the total population of England[ii]. The sample, therefore, included schools serving a range of urban, suburban and rural communities.

Private schools are not required to submit KS3 data and, where pupils attended private primary schools, KS2 data were also not available. Rather than restrict the analysis to pupils with complete data, thereby removing most privately-educated pupils from the analysis, we used multiple imputation to address these and other missing data with a missing-at-random assumption (Pampaka, Hutcheson, & Williams, 2016). We used the multiple imputation by Chained Equations (ICE) in STATA 13 to impute the missing data. Variables included in the imputation models are listed below and included the outcome variables (see Moons et al. 2006). 10 imputed datasets were created. Logit and ordered logit were used to deal with non-normality in the measures. The results presented in this paper use the full dataset after multiple imputation. Original observation numbers for each variable are given in Table 1. A complete case analysis was also conducted, giving the same substantive results, and is reported in Appendix C.

High achieving pupils are over-represented in our sample. The sample average GCSE grade was 7.16 and 7.36 in English and Maths (see Table 1) compared to the national average of 6.18 for both English and Maths (figures obtained from the National Pupil Database). 189 schools had been approached by the time the target number of schools had agreed to participate.

Table 1 - Descriptive statistics for Pupil Background and Achievement[a]

Source	***Background***	***Percent Applicable***	***Obs.***
National Pupil Database	At State school	68%	5507
	Gender is Male	46%	4633
	Ethnicity is White	75%	4553
	Disadvantaged (Free school meals eligible)	7%	2779
Questionnaire completed by Pupils	Mother in professional or managerial occupation	43%	4155
	Father in professional or managerial occupation	57%	4172
	Mother is known to be a graduate	41%	4545
	Father is known to be a graduate	43%	4526
	Intend to go to university	85%	4494
	Aiming for professional or managerial occupations when 30	83%	4159

Variable Group	***Expectations and Achievement***	***Mean***	***Std. Dev.***	***Min***	***Max***	***Obs.***
-	Cultural Capital	37.6	5.75	8	60	4574

Key Stage 2 (age 11) Prior attainment[b]	Finely Graded English Level	4.62	0.56	2.5	5.9	3394
	Finely Graded Mathematics Level	4.67	0.65	2.5	5.9	3391
Key Stage 3 (age 14) prior attainment[c]	English teacher assessment	6.09	0.93	1	8	2757
	Mathematics teacher assessment	6.78	1.22	2	8	2755
Pupil Grade Expectations at KS4[d]	Expected English GCSE Grade	7.53	1.08	1	9	4436
	Expected Mathematics GCSE Grade	7.61	1.22	2	9	4449
KS4 (age 16) Examination Grades[d]	Actual English GCSE Grade	7.16	1.30	1	9	4029
	Actual Mathematics GCSE Grade	7.36	1.54	1	9	4038

[a] Figures are for data after multiple imputation, observation numbers given are for the complete case analysis for reference.

[b] KS2 tests give either a level 3, 4 or 5. The number of marks between each level threshold is standardised to 1 to give a finely graded level. For example, 3.25 is a quarter of the way between the level 3 and level 4 mark thresholds. Pupils scoring below level 3 are teacher assessed as being level 2, 1 or 'Working towards' which are recorded as 2.5, 1.5 and 0.5, respectively.

[c] The KS3 tests were teacher assessed and give a discrete level ranging from 1 to 8

[d] GCSE examinations are awarded at eight grade levels (A*, A, B, C, D, E, F, G, U). We converted these grades into a continuous scale (A*=9, A=8, B=7, C=6, D=5, E=4, F=3, G=2, U=1).

3.3 Measures

This section describes how we operationalised measures of accuracy and optimism. Technical details, including model specifications are given in Appendix A. Descriptive statistics for the measures are presented in Table 2. We restrict our analysis to grades in English and mathematics as this aligns our study with previous research and also maximises our sample size.

We replicate previous studies by estimating the accuracy of pupils' expectations by comparing their expectations with actual grades. We define overestimation as expected grade minus the actual grade. We define inaccuracy as the absolute difference between expected and actual grade. The construct 'inaccuracy' aligns with the theory discussed in Section 2.2 since it gives equal weight to positive and negative differences between grade achieved and grade attained.

We measure optimism by through the difference between expected grade and grade predicted on the basis of prior attainment. We predict grades in a similar way to the method used by 'target setting' systems (e.g. RAISEOnline, YELLIS, Fisher Family Trust) commonly used by schools in England (Kelly & Downey, 2010). We use ordinal logistic regressions to provide discrete estimates of GCSE grades ($Grade'_{is}$) on the basis of prior attainment (English and Maths at Key Stage 2 and 3), gender and socioeconomic disadvantage (using the eligibility for free school meals indicator). These variables are all available to schools at the time of target setting. These regressions used data from all the pupils in our sample[iii]. Our predictions explained 36% of the variance in mathematics grades and 29% of the variance in English grades (pseudo-R^2 values). Using discrete grade

boundaries contributes to the level of unexplained variation, but it also indicates the high level of uncertainty in grade predictions.

For comparison we also included a second prediction of grades ($Grade''_{is}$), taking account of additional contextual variables to rule out interactions between socio-economic status and ethnicity. $Grade''_{is}$ takes account of several variables not commonly available to schools. Specifically, we include four proxies for socio-economic background: parental occupation, parental education, ethnicity and cultural capital. Previous studies (e.g. Sullivan, 2001) have found an association between cultural capital and attainment after taking account of other socio-economic characteristics. These predictions explained 39% of the variance in mathematics grades and 31% of the variance in English grades (pseudo-R^2 values).

Table 2 Descriptive statistics for grade predictions, optimism and value added

		Variable	***Mean***	***Std. Dev.***	***Min***	***Max***	***Obs.***
(1)	Over-estimation	Mathematics	0.25	0.85	-3	7	3822
		English	0.37	0.83	-4	6	3802
(2)	Inaccuracy	Mathematics	0.53	0.71	0	7	3822
		English	0.61	0.68	0	6	3802
(3)	$Grade'_{is}$ (Pupil Prediction)	Mathematics	7.54	1.48	1	9	2630
		English	7.18	1.08	1	9	2630
(4)	$Grade''_{is}$ (Contextualised Prediction)	Mathematics	7.47	1.48	1	9	1959
		English	7.17	1.11	1	9	1959
(5)	Optimism (expectation relative to Pupil Prediction)	Mathematics	0.07	0.88	-3	7	2471
		English	0.35	0.81	-4	6	2461
(6)	Contextualised Value added	Mathematics	-0.11	0.80	-4	4	1959
		English	-0.01	0.81	-4	3	1959

NB: Figures are for data after multiple imputation, observation numbers given are for the complete case analysis.

We conducted a series of robustness checks to examine the sensitivity of our results to alternative formulations of these two predicted grades, all giving the same substantive result. For these checks, the coefficients were also estimated using the National Pupil Database (NPD) data for all pupils in England.

Our data are consistent with the assumption that inaccuracy and over-estimation are distinct from each other. Whilst they are positively related (r=0.56 and 0.62 in mathematics and English respectively, both figures statistically significant at the 0.01 level), there is considerable variation at the individual level. A full correlation matrix for all variables is given in Appendix B. Care is needed when interpreting bivariate correlations, especially for variables such as value added that are derived from other variables. With the exception of the opening comparison between expectations and actual grade given in Table 3 below, results

are based on either multivariate analyses or bivariate analysis of variables such as optimism for which other factors have been controlled.

4. Results

4.1 Are pupils realistic in their grade expectations?

Pupils overestimated their actual grades by an average of 0.25 grades in maths and by an average of 0.37 grades in English. A full distribution is shown in Table 3.

Table 3 - Pupils' expected and actual grades

Expected Grades - English

Actual grade	U	G	F	E	D	C	B	A	A*
A*	0	0	0	0	0	0	16	252	550
A	0	0	0	1	0	6	223	970	413
B	0	0	0	0	2	91	711	581	84
C	0	0	0	0	13	423	486	112	14
D	0	0	1	6	31	247	92	17	2
E	0	1	3	9	34	62	13	2	0
F	0	0	2	4	7	8	2	0	1
G	0	1	4	2	2	0	0	0	0
U	2	1	1	1	0	1	0	0	0

Expected Grades - Mathematics

Actual grade	U	G	F	E	D	C	B	A	A*
A*	0	0	0	0	0	1	26	318	1236
A	0	0	0	0	0	17	215	819	326
B	0	0	0	0	0	112	483	345	45
C	0	0	0	1	19	541	403	70	7
D	0	0	0	6	19	170	39	4	0
E	0	0	0	11	32	94	8	2	0
F	0	1	4	12	28	38	2	0	0
G	0	5	4	17	11	8	1	1	1
U	0	3	2	1	0	0	1	0	0

NB: Rounded to 0DP where differences across imputed datasets caused non-integer results This makes it clearer that the figures pertain to numbers of pupils.

4.2 What are the pupil- and school-level correlates of pupil optimism and inaccuracy?

The results presented in this section are fixed effects estimates from mixed effects multi-level regression models on the listed variables. We used a linear analysis rather than an ordered logit and this lends itself to reporting coefficient values (i.e. unstandardized coefficients) for each factor using a meaningful measurement scale (as per Table 2). An ordered logit analysis would require reporting of prediction equation-level scores against ordered grade cut-off thresholds.

Table 4 presents associations between pupil characteristics and inaccuracy. We found that pupils with higher prior attainment had slightly more accurate expectations, although

prior attainment only accounted for 7% of inaccuracy in pupils' expectations of mathematics grades and 3% of inaccuracy in pupils' expectations of English grades. We found no significant associations between inaccuracy and any of gender, ethnicity or the socio-economic status indicators, with the exception of the disadvantage variable in maths which was associated with approximately 1/6th of a grade more expectation inaccuracy.

Table 4 Factors associated with inaccuracy in grade predictions in English and mathematics

Mixed-effects multi-level regression	**English**		**Maths**	
	Coef.	Std. Err.	Coef.	Std. Err.
Key Stage 2 English Test (Age 11)	-.07*	.03	.02	.03
Key Stage 2 Maths Test (Age 11)	.02	.03	-.09**	.03
Key Stage 3 English Teacher Assessment (Age 14)	-.08**	.02	-.04*	.02
Key Stage 3 Maths Teacher Assessment (Age 14)	-.08**	.02	-.15**	.02
Disadvantaged (Free school meals eligible)	.05	.05	.16**	.05
Gender (Male =1)	.03	.02	.02	.02
Ethnicity (White =1)	-.02	.02	.02	.02
Graduate father	-.02	.02	-.02	.02
Graduate mother	-.01	.03	-.03	.03
Cultural capital	.00	.00	.00	.00
Father in professional or managerial job	-.02	.02	-.01	.02
Mother in professional or managerial job	.03	.02	.02	.02
Aspires to professional or managerial job	-.03	.03	-.03	.03
Intends to go to university	-.01	.03	.03	.04
Attends state school (=1)	.02	.06	.05	.04
Constant	1.94	.13	.02	.03
Pseudo† R^2		0.07		0.16
% of residual variance situated at school-level		19.7%		13.4%
n		5507		5507

† Snijders/Bosker Level 1 R^2 mean value across all imputed datasets (English min = 0.07, max = 0.08; Maths min=0.15, max=0.17)

$^{*}p<.05$ $^{**}p<.01$

Table 5 presents associations between pupil characteristics and optimism. Pupils with higher prior attainment and higher cultural capital were less optimistic. An increase of one standard deviation in each of these variables was related to changes in optimism of: -0.51 (maths), -0.23 (English) and -0.06 (cultural capital). In part, this could be attributed to a ceiling effect but it also reflected an inverse relationship between ability and levels of gross over-expectation. Boys and non-white pupils tended to be more optimistic than other pupils about grades in maths but we did not find a meaningful association between optimism in English and either gender or ethnicity. Three of our four parental status variables were not associated with optimism, but there was a small positive association between having a mother in professional or managerial job and optimism. Removing the variable 'intends to go to university' from the regression resulted in (i) father's occupation becoming significant at the

5% level, but with little change to the size of the coefficient; and (ii) the coefficient on aspiration to professional or managerial occupation became larger and was significant at the 1% level for both subjects. Pupils who declared that they were probably or definitely going to university were one quarter of a grade more optimistic than other pupils. Pupils attending state schools were 0.15 of a grade less optimistic than private school pupils about their maths grade and over a quarter of a grade less optimistic than private school pupils in English. Caution is needed with this conclusion, however, given the lower availability of prior attainment data for the private sector.

Table 5 Factors associated with optimism about grades in English and mathematics

Mixed-effects multi-level regression	**English**		**Maths**	
	Coef.	Std. Err.	Coef.	Std. Err.
Key Stage 2 English Test (Age 11)	-.13**	.04	.13**	.04
Key Stage 2 Maths Test (Age 11)	.17**	.03	-.05	.03
Key Stage 3 English Teacher Assessment (Age 14)	-.15**	.02	-.13**	.03
Key Stage 3 Maths Teacher Assessment (Age 14)	-.25**	.02	-.42**	.02
Disadvantaged (Free school meals eligible)	.01	.06	.25**	.06
Gender (Male =1)	-.03	.03	.12**	.03
Ethnicity (White =1)	-.03	.03	-.22**	.03
Graduate father	.03	.03	.06	.03
Graduate mother	.04	.03	.05	.03
Cultural capital	-.01**	.00	-.01**	.00
Father in professional or managerial job	.06	.03	.02	.03
Mother in professional or managerial job	.09**	.03	.05	.02
Aspires to professional or managerial job	.06	.04	.12**	.04
Intends to go to university	.24**	.04	.26**	.04
Attends state school (=1)	-.28**	.09	-.15	.07
Constant	3.00	.18	3.30	.19
Pseudo† R^2		0.16		0.33
% of residual variance situated at school-level		16.6%		13.4%
n		5507		5507

† Snijders/Bosker Level 1 R^2 mean value across all imputed datasets (English min = 0.14, max = 0.18; Maths min=0.32, max=0.36)

*p<.05 **p<.01

With the notable exceptions of ethnicity and disadvantage, the overall relationships were similar in both subjects. However, there were differences between the subjects at pupil-level: the correlation between optimism in English and optimism in maths was 0.38 and the correlation between actual grade achieved in English and actual grade achieved in maths was 0.74. Table 5 also presents the percentage of residual variable situated at school level, obtained from partitioning the model's random effects into pupil- and school-level variance (Snijders & Bosker, 2011). This can be interpreted a measure of the extent to which optimism is related to school level factors: the pupil intake, school processes and school achievement.

4.3 Are expectations predictive of attainment after adjusting for prior attainment and other contextual factors?

We tested whether pupils' expectations give useful predictive information over and above grade predictions based on pupils' prior attainment and background characteristics. We added expectations as an explanatory variable in the ordered logit model used to create ($Grade''_{is}$) (see Appendix A). Table 6 summarises the (pseudo) R^2 values, giving the proportion of variance accounted for with and the inclusion of pupil grade expectations as a predictor and for the original model:

Table 6 Variance in raw GCSE attainment accounted for

	Variance in Attainment Explained †	
	Grade Prediction with all contextual variables ($Grade''_{is}$)	***After including the pupils' grade expectations***
Mathematics	39%	45%
English	31%	37%

† Pseudo R^2 mean value across all imputed datasets

Table 6 indicates that including pupils' grade expectations explains an additional 6% of variance in mathematics and English grades. For the purposes of this study this is also a necessary but not sufficient piece of evidence that expectations can play a causal role in pupil value added.

4.4 What is the relationship between optimism and contextualised value added?

The next step was to examine the relationship between pupil value-added and pupil grade expectations. The figures in Table 7 show the figures for maths and English, expressed in terms of number of grades per subject. Table 7 shows that, in English, ten pupils were awarded grades that were three grades below the grades predicted by their prior attainment and characteristics (Equation 5, Appendix A). Of these ten pupils, relative to a reasonable prediction based on information available at the time (Equation 3, Appendix A), two expected grades that were one lower, two had expectations in line with the prediction and four expected a higher grade.

Overall, pupils who were more optimistic than their predicted attainment tended to achieve higher grades. The average value added relative to expectations, at each level of optimism is given in the right-hand column. The vast majority of pupils with expectations lower than a reasonable prediction (Optimism of -1 or lower) also had lower value added relative to statistical predictions (bottom left-hand quadrant). Similarly, most pupils who expected a grade or more above the grade predicted by their characteristics and prior attainment (Optimism of 1 and above) also performed above expectations (top right quadrant). The bottom right-hand quadrants in each subject contain pupils with relatively low expectations (Optimism of -1 or lower) who nonetheless had performance exceeding expectations; it contains only 46 pupils in English and 93 in mathematics out of 5507 pupils per subjects, or about 0.8% and 1.7% of the total number of pupils in English and mathematics.

Table 7 The relationship between optimism and value added in English and mathematics[3]

	English Pupil value added[1]							
Pupil Optimism[2]	-3 or lower	-2	-1	0	1	2	3 or more	Row mean Value added
3 or more	0	0	1	9	8	3	1	0.67
	0.0%	0.0%	4.5%	40.9%	36.4%	13.6%	4.5%	
2	1	8	29	118	123	33	1	0.47
	0.3%	2.6%	9.3%	37.7%	39.3%	10.5%	0.3%	
1	3	29	238	902	727	44	0	0.26
	0.2%	1.5%	12.2%	46.4%	37.4%	2.3%	0.0%	
0	2	65	622	1455	390	17	0	-0.13
	0.1%	2.5%	24.4%	57.0%	15.3%	0.7%	0.0%	
-1	2	52	298	247	43	1	0	-0.57
	0.3%	8.1%	46.3%	38.4%	6.7%	0.2%	0.0%	
-2	1	10	14	5	2	0	0	-1.13
	3.1%	31.3%	43.8%	15.6%	6.3%	0.0%	0.0%	
-3 or lower	0	0	2	0	0	0	0	-0.73
	0.0%	0.0%	66.7%	0.0%	0.0%	0.0%	0.0%	
Total	10	164	1204	2736	1293	98	2	
	0.2%	3.0%	21.9%	49.7%	23.5%	1.8%	0.0%	
	Mathematics Pupil value added[1]							
Pupil Optimism[2]	-3 or lower	-2	-1	0	1	2	3 or more	Row mean Value added
3 or more	0	2	10	15	19	13	6	0.72
	0.0%	3.1%	15.4%	23.1%	29.2%	20.0%	9.2%	
2	1	11	37	97	89	32	1	0.36
	0.4%	4.1%	13.8%	36.2%	33.2%	11.9%	0.4%	
1	2	14	139	447	340	32	2	0.24
	0.2%	1.4%	14.2%	45.8%	34.8%	3.3%	0.2%	
0	7	73	578	1929	367	16	0	-0.12
	0.2%	2.5%	19.5%	64.9%	12.4%	0.5%	0.0%	
-1	5	65	483	476	86	2	0	-0.48
	0.4%	5.8%	43.2%	42.6%	7.7%	0.2%	0.0%	
-2	3	20	57	25	5	0	0	-0.91
	2.7%	18.2%	51.8%	22.7%	4.5%	0.0%	0.0%	
-3 or lower	0	1	1	1	0	0	0	-1.18
	0.0%	33.3%	33.3%	33.3%	0.0%	0.0%	0.0%	
Total	18	186	1305	2990	906	95	9	
	0.3%	3.4%	23.7%	54.3%	16.4%	1.7%	0.2%	

[1] (P_{is}) Number of grades pupil attainment exceeds grade prediction, $Grade''_{is}$

[2] (O_{is}) Number of grades pupil expectation exceeds grade prediction, $Grade'_{is}$

[3] Rounded to 0DP where taking means across imputed datasets caused non-integer results. This makes it clearer that the figures pertain to numbers of pupils.

With the exception of the two pupils in English with Optimism of -3 or lower, each increase in optimism was associated with higher value added in both subjects, even when predicting 2 or 3 grades above the predicted grade.

Table 8 simplifies the relationship between optimism and value added given in the right-hand column of Table 7 to provide estimates of the typical association between optimism and achievement for each subject. These coefficients were estimated through a simple univariate linear regression on the basis that our definition of optimism already controls for contextual variables. For each increase in pupil grade expectations above their predicted grade, pupil value added increased on average by 0.32 (d = 0.40) and 0.37 (d = 0.46) grades in mathematics and English respectively.

Table 8 Results of univariate regressions of contextualised value-added on optimism of pupil grade expectations

		Coefficient value*	***Standard Error***	***R^2 for regression***
All Pupils	***Maths Optimism***	0.32	0.02	0.12
	English Optimism	0.37	0.02	0.13
Pupils expected to achieve grades B or C[†]	***Maths Optimism***	0.29	0.01	0.09
	English Optimism	0.36	0.01	0.12
Gender is male	***Maths Optimism***	0.31	0.01	0.12
	English Optimism	0.39	0.01	0.14
Ethnicity is White	***Maths Optimism***	0.33	0.00	0.13
	English Optimism	0.36	0.00	0.13
State School	***Maths Optimism***	0.29	0.00	0.11
	English Optimism	0.34	0.00	0.12
Disadvantaged (Free school meals eligible)	***Maths Optimism***	0.24	0.01	0.08
	English Optimism	0.23	0.01	0.07

[†] Since these averages might be distorted by ceiling and floor effects we repeated the analysis restricting the analysis to pupils expected to achieve combinations of grades B and C.

[*] All coefficients are statistically significant at the 0.01 level

5. Discussion

5.1 Findings in relation to hypotheses

We now comment on our results in relation to the hypotheses which were derived from our reading of previous studies. The extent of pupils' over-estimation of grades places our results towards the lower part of the range found in previous studies (Sullivan, 2006; Attwood et al., 2013) (Hypothesis 1). Our evidence also supported Hypothesis 2 (see Ots, 2013), although prior attainment was associated with a fairly small proportion of the variance in grade expectations (7% in mathematics, 3% in English). As anticipated by Hypothesis 3, we found

that boys and non-white pupils were more optimistic about mathematics grades. However, we found no evidence of a similar association in expectations of English grades. Previous studies (e.g. Davies, Mangan & Telhaj, 2005) have used either much narrower or broader measures of optimism. For example, Kleitman & Gibson (2011) asked pupils to judge their success in answering a specific question whilst Goyette & Xie (1999) asked pupils to predict the highest level of education they would achieve. Our results are broadly similar to these studies, albeit with a focus on examination grades which are central to 'high-stakes testing' regimes. Hypothesis 4 (that higher SES would be positively associated with optimism) was based on Bandura's (1993) model suggesting that parents' goals would be reflected in pupils' grade expectations. We found some support for this hypothesis, largely through positive associations between pupils' own aspirations for a high-status occupation, occupational status of parents and optimism about grades. Through the novel inclusion of a measure of cultural capital we are able to distinguish between 'normalisation; processes associated with parents' education and occupation and cultural capital associated with the process of parenting. We found a positive relationship between optimism and parental occupation (which could be interpreted as a 'habitus' effect) but a negative association between optimism over grades and cultural capital.

Previous research has found that pupil have distinct academic self-concepts in different subjects (e.g. Marsh, Relich & Smith, 1983), providing the basis for hypothesis (5). We have extended this result through our 'optimism' construct which measures the difference between pupils' expected grades and a predicted grade on the basis of pupil characteristics including prior achievements. We found a modest correlation (0.38) between optimism in grade expectations for English and maths suggesting that optimism is domain specific.

Hypothesis 6 was based on previous research (Hoy, Tarter & Hoy, 2006; Fraine et al, 2007; Van der gaer et al., 2009) indicating that a modest proportion of variance in pupils' optimism is related to school level effects. Our results (attributing roughly 15% of the variance to the school) support this expectation. There are reasons for caution however: First, the size of these associations looks larger than school effects for academic self-concept reported elsewhere (Fraine et al., 2007; Van de gaer et al., 2009). Second, as part of our estimation of ($Grade''_{is}$) we recorded the school effect on value-added (i.e. attainment after controlling for prior attainment and pupil characteristics). This was 24.6% for mathematics and 28.2% for English. Both are considerably higher than figures typically reported in the literature of between 3.8% and 16.5% (Luyten, 2003). Coupled with the first point, this suggests that the over-representation of private schools in our sample has substantially inflated the proportion of variation between schools. Third, while this school effect is an appreciable fraction of the overall variation in optimism, optimism itself only accounts for a fraction of variance in pupil value added (see above). Finally, only naturally occurring variation was studied here in a correlational analysis. In sum, there is some evidence for a possible school effect here but it remains unclear whether schools can have a substantial effect on attainment in practice through planned interventions to change expectations. This possibility would need to be examined using an appropriate causal research design.

Our results provided clear support for hypotheses 7 and 8. Pupils had more optimistic grade expectations if they intended to go to university (one quarter of a grade) or attended a private school (quarter of a grade for English one seventh of a grade for maths). Hypothesis 7

(regarding intention to go to university) was inferred from our reading of the literature on self-efficacy and aspirations, though we are not aware of any previous study that has examined this relationship. After controlling for parents' characteristics, pupils who intended to go to university were one quarter of a grade more optimistic than those who did not intend to go to university. Regardless of the direction of causation this result, if substantiated by further research, is sufficiently large to matter for policies on school effectiveness and preparation for higher education.

Previous research has suggested that greater self-efficacy or academic self-concept will lead to higher achievement (e.g. Parker et al., 2014; Stankov & Lee, 2014). However, research on the realism of expectations has also suggested that 'over-optimistic' expectations will reduce achievement (e.g. Rubie-Davies, Hattie & Hamilton, 2006; Sheldrake, 2016). Combining these two strands of research provided the basis for hypothesis 9, predicting a non-linear relationship between optimism and future achievement, although we located one previous study (Svanum & Bigatti, 2006) that was designed to check this relationship, and that study was in higher education. We found that each extra grade expected is associated with average higher value added of about a third of a grade (d = 0.40-0.46). However, we found no evidence that this was a non-linear relationship. We found no evidence of a damaging effect of 'over-optimism'. This may reflect the extent to which target setting has become embedded in thinking and practice in English schools.

5.2 Study Limitations

There are several limitations of this study which should be noted when considering the robustness of these results. The study sample, while relatively large and diverse, over-represents higher-ability and private school pupils. Even though schools were approached at random, self-selection effects are likely and findings may differ from fully-representative samples. In particular, estimated school effects are possibly inflated by combined analysis of private and state schools and the proportions of the former. There were appreciable rates of missing data for several variables studied. These missing data were imputed using multiple imputation and results were checked against a complete case analyses (see Appendix C); however, a strong possibility that data were not missing at random may still influence the estimates (Cheema, 2014).

The model specifications used in this study (see Appendix A) were kept consistent for both subjects. Analyses used available variables suggested in the literature and used in practice (see Section 3.3). It is possible that subject-specific formulae or formulae that are aligned to different contexts would affect the results, especially in relation to factor coefficients given in Tables 4 and 5. Alternative models were tested during analysis as well as analyses by sub-groups (given in Table 8); these analyses suggest that the main estimate of the relationship between optimism and value added is robust with respect to changes in model specification.

Another limitation relates to our ability to distinguish the level of optimism from the amount of information available to pupils. Some of the difference between pupils' expectations and our estimate of 'realistic expectations' is surely attributable to additional knowledge which pupils possess. Therefore, what appears as optimism may be partly due to expectations taking more recent, more fine-grained or wider sources of information into

account. Finally, the conclusions presented are based on correlational analyses. It has been noted that further research will be needed to establish the nature and magnitude of school effects on optimism and evaluate any causal claims about the impact of interventions to influence expectations and of expectations *per se* on attainment.

With these caveats in mind, we now suggest how these results and the practice of setting pupil grade targets in schools can be placed within the extensive literature on pupil agency in learning.

5.3 Implications for School Target-Setting and Feedback

These results inform several practical questions faced by schools. One such question is whether schools should encourage optimism and whether they should do so even to the extent that expectations become unrealistic in relation to prior performance. Our results are in line with previous research indicating that pupils, particularly those with lower prior attainment, already tend to over-estimate their future grades. However, we also find a clear positive relationship between optimism and future (value-added) performance and our results suggest that even 'unrealistic' optimism seems to help more pupils than it hinders. Successive increases in expectations over predicted grades were associated with greater performance and, conversely, for pupils expecting a grade lower than the data would predict, only a tiny fraction (≈1%) ultimately exceeded their predicted grade. This provides support for encouraging optimism, particularly where expectations are below predicted grades. The extent to which levels of pupil optimism are in fact malleable and the direct causal impact of interventions to promote optimism, however, requires further experimental work to establish (EEF, 2016; Gorard, 2011).

Another practical question relates to the role of pupils' expectations in the target-setting process. This study suggests that pupils' expectations have both an informative and a formative value: We found that pupil's expected performance had predictive value over and above data-based predictions. Thus, they are one source of information to refine targets and help schools identify pupils whose expectations are low relative to data-driven predictions. There is an inevitable limit to which solely data-driven targets can be relevant at the level of individual pupils. As stressed by advocates of dynamic assessment (e.g. Elliott, 2003), evidence of subject ability from summative assessments (such as national curriculum grades in England) omit crucial evidence about a pupil's readiness to progress and, necessarily, cannot tell pupils anything about the likelihood that they will experience a step-change over the coming months in their understanding of how a subject works. A pupil's grade prediction makes assumptions about where their current ZPD frontier lies, how close to the frontier they are currently working and the potential that they will push that frontier onwards. Moreover, our results highlight that blanket rules based on predicted grades run the risk of deflating rather than raising pupils' attainment aspirations where expectations are high. This all suggests that pupil expectations, along with teacher assessments and judgements, can go some way to bridge the gap between data-driven expectations and the circumstances and capacities of individual pupils.

The theory and evidence reviewed in the opening sections and the findings of this paper provide necessary but not sufficient evidence for the view that pupils' expectations play a causal role in their performance. This suggests that eliciting and discussing pupils'

expectations may also play a formative role, where the target-setting process (e.g. a mentoring session with a teacher) can provide an opportunity for teachers to support pupils to consider and change their self-beliefs. Where pupils have pessimistic expectations, these can be challenged; where expectations are already high, this is an opportunity to discuss what is required to realise the goal. We note that our study focuses on pupils' expectations rather than teachers' expectations or targets which teachers set for pupils. Encouraging pupils to be ambitious in *their* targets is different from setting a target which pupils are expected to achieve. Our interpretation of the literature on pupils' capacity for learning leads us to conclude that expectations are one causal component in a mechanism of reciprocally-linked factors including pupils' targets, self-beliefs, understanding of subject epistemes and their learning.

References

Alexander, P. A. (2013). Calibration: What is it and why it matters? An introduction to the special issue on calibrating calibration. *Learning and Instruction*, *24*, 1–3. https://doi.org/10.1016/j.learninstruc.2012.10.003

Anderson, C., Brion, S., Moore, D. A., & Kennedy, J. A. (2012). A status-enhancement account of overconfidence. *Journal of Personality and Social Psychology*, *103*(4), 718–735. https://doi.org/10.1037/a0029395

Attwood, G., Croll, P., Fuller, C., & Last, K. (2013). The accuracy of pupils' predictions of their GCSE grades. *Educational Studies*, *39*(4), 444–454. https://doi.org/10.1080/03055698.2013.776945

Bandura, A. (1993). Perceived Self-Efficacy in Cognitive Development and Functioning. *Educational Psychologist*, *28*(2), 117-148. https://doi.org/10.1207/s15326985ep2802_3

Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (1996). Multifaceted impact of self efficacy beliefs on academic functioning. *Child Development*, *67*(3), 1206–1222.

Black, P., & Wiliam, D. (1998). Assessment and Classroom Learning. *Assessment in Education: Principles, Policy & Practice*, *5*(1), 7–74. https://doi.org/10.1080/0969595980050102

Bong, M. (2013). Self-Efficacy. In J. Hattie & E. Anderman (Eds.), *International Guide to Pupil Achievement* (pp. 64–66). Book Section, Routledge.

Bong, M., Cho, C., Ahn, H. S., & Kim, H. J. (2012). Comparison of Self-Beliefs for Predicting Pupil Motivation and Achievement. *The Journal of Educational Research*, *105*(5), 336–352. https://doi.org/10.1080/00220671.2011.627401

Bong, M., & Skaalvik, E. M. (2003). Academic self-concept and self-efficacy: How different are they really? *Educational Psychology Review*, *15*(1), 1–40.

Bouffard, T., Vezeau, C., Roy, M., & Lengelé, A. (2011). Stability of biases in self-evaluation and relations to well-being among elementary school children. *International Journal of Educational Research*, *50*(4), 221–229. https://doi.org/10.1016/j.ijer.2011.08.003

Buckelew, S. P., Byrd, N., Key, C. W., Thornton, J., & Merwin, M. M. (2013). Illusions of a Good Grade: Effort or Luck? *Teaching of Psychology*, *40*(2), 134–138. https://doi.org/10.1177/0098628312475034

Butler, R. (2011). Are positive illusions about academic competence always adaptive, under all circumstances: New results and future directions. *International Journal of Educational Research*, *50*(4), 251–256. https://doi.org/10.1016/j.ijer.2011.08.006

Chan, C., Burtis, J., & Bereiter, C. (1997). Knowledge Building as a Mediator of Conflict in Conceptual Change. *Cognition and Instruction*, *15*(1), 1–40. https://doi.org/10.1207/s1532690xci1501_1

Cheema, J. R. (2014). A Review of Missing Data Handling Methods in Education Research. *Review of Educational Research*, *84*(4), 487–508. https://doi.org/10.3102/0034654314532697

Chevalier, A., Gibbons, S., Thorpe, A., Snell, M., & Hoskins, S. (2009). Pupils' academic self-perception. *Economics of Education Review*, *28*(6), 716–727. https://doi.org/10.1016/j.econedurev.2009.06.007

Coe, R. (2013). Evidence on the Role and Impact of Performance Feedback in Schools. In A. J. Visscher & R. Coe (Eds.), *School improvement through performance feedback*. Book Section, London: Routledge.

Davies, P., Coates, G., Hammersley-Fletcher, L., & Mangan, J. (2005). When "becoming a 50% school" is success enough: a principal–agent analysis of subject leaders' target setting. *School Leadership & Management*, *25*(5), 493–511. Journal Article. https://doi.org/10.1080/13634230500340898

Davies, P., Durbin, C., Clarke, J., & Dale, J. (2004). Developing pupils' conceptions of quality in geography. *Curriculum Journal*, *15*(1), 19–34. https://doi.org/10.1080/1026716032000189452

Davies, P., Mangan, J. and Telhaj, S. (2005). 'Bold, reckless and adaptable'? Explaining gender differences in economic thinking and attitudes. *British Educational Research Journal,* 31, 1, pp. 29-48.

Davies, P., Qiu, T., & Davies, N. M. (2014). Cultural and human capital, information and higher education choices. *Journal of Education Policy*, *29*(6), 804–825. https://doi.org/10.1080/02680939.2014.891762

DCSF. (2008). Personalised learning–a practical guide. (Department for Children Schools and Families, Ed.). Government Document, Nottingham: DCSF Publications.

DfE. (2012). Guidance for Local Authorities and Schools on Setting Educational Performance Targets for 2012. (Department for Education, Ed.). Government Document, London. Retrieved from http://media.education.gov.uk/assets/files/pdf/2/2012 target setting guidance.pdf

Dunlosky, J., & Thiede, K. W. (2013). Four cornerstones of calibration research: Why understanding pupils' judgments can improve their achievement. *Learning and Instruction*, *24*(1), 58–61. https://doi.org/10.1016/j.learninstruc.2012.05.002

Dupeyrat, C., Escribe, C., Huet, N., & Régner, I. (2011). Positive biases in self-assessment of mathematics competence, achievement goals, and mathematics performance. *International Journal of Educational Research*, *50*(4), 241–250. https://doi.org/10.1016/j.ijer.2011.08.005

EEF. (2016). Aspiration interventions. Retrieved November 10, 2016, from https://educationendowmentfoundation.org.uk/resources/teaching-learning-toolkit/aspiration-interventions/

Elliott, J. (2003). Dynamic Assessment in Educational Settings: Realising potential. *Educational Review*, *55*(1), 15–32. https://doi.org/10.1080/00131910303253

Ferla, J., Valcke, M., & Cai, Y. (2009). Academic self-efficacy and academic self-concept: Reconsidering structural relationships. *Learning and Individual Differences*, *19*(4), 499–505. https://doi.org/10.1016/j.lindif.2009.05.004

Förster, N., & Souvignier, E. (2014). Learning progress assessment and goal setting: Effects on reading achievement, reading motivation and reading self-concept. *Learning and Instruction*, *32*, 91–100. https://doi.org/10.1016/j.learninstruc.2014.02.002

Fraine, B. De, Damme, J. Van, & Onghena, P. (2007). A longitudinal analysis of gender differences in academic self-concept and language achievement: A multivariate multilevel latent growth approach. *Contemporary Educational Psychology*, *32*(1), 132–150. https://doi.org/10.1016/j.cedpsych.2006.10.005

Goldsmith, P. A. (2004). Schools' racial mix, pupils' optimism, and the Black-White and Latino-White achievement gaps. *Sociology of Education*, *77*(2), 121-147.

Gorard, S., See, B-H. & Davies, P. (2011). *Do Attitudes and Aspirations Matter in Education?: A review of the research evidence*. Book, Saarbrucken: Lambert Academic Publishing.

Goyette, K., & Xie, Y. (1999). Educational expectations of Asian American youths: Determinants and ethnic differences. *Sociology of Education*, 22-36.

Hacker, D. J., Bol, L., Horgan, D. D., & Rakow, E. a. (2000). Test prediction and performance in a classroom context. *Journal of Educational Psychology*, *92*(1), 160–170. https://doi.org/10.1037/0022-0663.92.1.160

Hattie, J. (2005). What is the nature of evidence that makes a difference to learning? Retrieved May 3, 2016, from http://research.acer.edu.au/research_conference_2005/7

Hattie, J. (2013). Calibration and confidence: Where to next? *Learning and Instruction*, *24*(1), 62–66. https://doi.org/10.1016/j.learninstruc.2012.05.009

Hattie, J., & Timperley, H. (2007). The Power of Feedback. *Review of Educational Research*, *77*(1), 81–112. https://doi.org/10.3102/003465430298487

Heck, R. H., Thomas, S. L., & Tabata, L. N. (2013). Summary for Policymakers. In Intergovernmental Panel on Climate Change (Ed.), *Climate Change 2013 - The Physical Science Basis* (Vol. 53, pp. 1–30). Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781107415324.004

Hossain, B., & Tsigaris, P. (2015). Are grade expectations rational? A classroom experiment. *Education Economics*, *23*(2), 199–212. https://doi.org/10.1080/09645292.2012.735073

Hoy, W. K., Tarter, C. J., & Hoy, A. W. (2006). Academic optimism of schools: A force for pupil achievement. *American Educational Research Journal*, *43*(3), 425-446.

Jansen, M., Schroeders, U., & Lüdtke, O. (2014). Academic self-concept in science: Multidimensionality, relations to achievement measures, and gender differences. *Learning and Individual Differences*, *30*, 11–21. https://doi.org/10.1016/j.lindif.2013.12.003

Kappes, H. B., Oettingen, G., & Mayer, D. (2012). Positive fantasies predict low academic achievement in disadvantaged pupils. *European Journal of Social Psychology*, *42*(1), 53–64. https://doi.org/10.1002/ejsp.838

Kelly, A., & Downey, C. (2010). Value-added measures for schools in England: looking inside the “black box” of complex metrics. *Educational Assessment, Evaluation and Accountability*, *22*(3), 181–198. https://doi.org/10.1007/s11092-010-9100-4

Kelly, A., Downey, C., & Rietdijk, W. (2010). *Data dictatorship and data democracy: understanding professional attitudes to the use of pupil performance data in schools (Research Summary)* (Report). Online: CfBT. Retrieved from http://eprints.soton.ac.uk/147597/

Kleitman, S., & Gibson, J. (2011). Metacognitive beliefs, self-confidence and primary learning environment of sixth grade pupils. *Learning and Individual Differences*, *21*(6), 728-735.

Kim, Y.-H., Chiu, C.-Y., & Zou, Z. (2010). Know thyself: Misperceptions of actual performance undermine achievement motivation, future performance, and subjective well-being. *Journal of Personality and Social Psychology*, *99*(3), 395–409. https://doi.org/10.1037/a0020555

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting & task performance.* Book, Prentice-Hall, Inc.

Loibl, K., & Rummel, N. (2014). Knowing what you don’t know makes failure productive. *Learning and Instruction*, *34*, 74–85. https://doi.org/10.1016/j.learninstruc.2014.08.004

Luyten, H. (2003). The Size of School Effects Compared to Teacher Effects: An Overview of the Research Literature. *School Effectiveness and School Improvement*, *14*, 31-51. https://doi.org/10.1076/sesi.14.1.31.13865

Marsh, H. W., Relich, J. D., & Smith, I. D. (1983). Self-concept: The construct validity of interpretations based upon the SDQ. *Journal of Personality and social psychology*, *45*(1), 173.

Mason, L., Boscolo, P., Tornatora, M. C., & Ronconi, L. (2013). Besides knowledge: a cross-sectional study on the relations between epistemic beliefs, achievement goals, self-beliefs, and achievement in science. *Instructional Science*, *41*(1), 49–79. https://doi.org/10.1007/s11251-012-9210-0

Mason, L., Gava, M., & Boldrin, A. (2008). On warm conceptual change: The interplay of text, epistemological beliefs, and topic interest. *Journal of Educational Psychology*, *100*(2), 291–309. https://doi.org/10.1037/0022-0663.100.2.291

McDonald, B., & Boud, D. (2003). The Impact of Self-assessment on Achievement: The effects of self-assessment training on performance in external examinations. *Assessment in Education: Principles, Policy & Practice*, *10*(2), 209–220. https://doi.org/10.1080/0969594032000121289

Mento, A. J., Steel, R. P., & Karren, R. J. (1987). A meta-analytic study of the effects of goal setting on task performance: 1966–1984. *Organizational Behavior and Human Decision Processes*, *39*(1), 52–83. https://doi.org/10.1016/0749-5978(87)90045-8

Miller, T. M., & Geraci, L. (2011). Unskilled but aware: Reinterpreting overconfidence in low-performing pupils. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *37*(2), 502–506. https://doi.org/10.1037/a0021802

Moons, K. G. M., Donders, R. A. R. T., Stijnen, T., & Harrell, F. E. (2006). Using the outcome for imputation of missing predictor values was preferred. *Journal of Clinical Epidemiology*, *59*(10), 1092–1101. https://doi.org/10.1016/j.jclinepi.2006.01.009

Morony, S., Kleitman, S., Lee, Y. P., & Stankov, L. (2013). Predicting achievement: Confidence vs self-efficacy, anxiety, and self-concept in Confucian and European countries. *International Journal of Educational Research, 58*, 79–96. https://doi.org/10.1016/j.ijer.2012.11.002

Muller and Associates. (2001). *Target setting in school education: a discussion paper*. Online: MCEETYA National Education Performance Monitoring Taskforce (NEPMT). Retrieved from http://www.scseec.edu.au/archive/Publications/Publications-archive.aspx

Multon, K. D., Brown, S. D., & Lent, R. W. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology, 38*(1), 30–38. https://doi.org/10.1037/0022-0167.38.1.30

Ofsted (2011). *Removing barriers to literacy*. Ref. 090237. London, Ofsted.

Ofsted (2013a). Outstanding Individual Target Setting: Highbury College [Generic]. Retrieved May 3, 2016, from https://www.gov.uk/government/publications/outstanding-individual-target-setting-highbury-college

Ofsted (2013b). *Are the most able pupils doing as well as they should in our secondary schools?* (Report). London. Retrieved from https://www.gov.uk/government/publications/are-the-most-able-pupils-doing-as-well-as-they-should-in-our-secondary-schools

Ots, A. (2013). Third graders' performance predictions: calibration deflections and academic success. *European Journal of Psychology of Education, 28*(2), 223–237. https://doi.org/10.1007/s10212-012-0111-z

Pampaka, M., Hutcheson, G., & Williams, J. (2016). Handling missing data: analysis of a challenging data set using multiple imputation. *International Journal of Research & Method in Education, 39*(1), 19–37. https://doi.org/10.1080/1743727X.2014.979146

Parker, P. D., Marsh, H. W., Ciarrochi, J., Marshall, S., & Abduljabbar, A. S. (2014). Juxtaposing math self-efficacy and self-concept as predictors of long-term achievement outcomes. *Educational Psychology, 34*(1), 29–48. https://doi.org/10.1080/01443410.2013.797339

Perkins, D. (2006). *Overcoming Barriers to Pupil Understanding*. (J. H. F. Meyer & R. Land, Eds.), *Overcoming barriers to pupil understanding: Threshold concepts and troublesome knowledge*. Book Section, London: Routledge. https://doi.org/10.4324/9780203966273

Rubie-Davies, C., Hattie, J., & Hamilton, R. (2006). Expecting the best for pupils: Teacher expectations and academic outcomes. *British Journal of Educational Psychology, 76*(3), 429-444.

Schraw, G. (2009). A conceptual analysis of five measures of metacognitive monitoring. *Metacognition and Learning, 4*(1), 33–45. https://doi.org/10.1007/s11409-008-9031-3

Sheldrake, R. (2016). Confidence as motivational expressions of interest, utility, and other influences: Exploring under-confidence and over-confidence in science pupils at secondary school. *International Journal of Educational Research, 76*, 50–65. https://doi.org/10.1016/j.ijer.2015.12.001

Smith, S. (2009). *Academic target setting: Formative use of achievement data*. *PhD Thesis*. ResearchSpace@ Auckland. Retrieved from https://researchspace.auckland.ac.nz/handle/2292/5863

Snijders, T. A. B., & Bosker, R. J. (2011). *Multilevel analysis: An introduction to basic and advanced multilevel modeling* (2nd ed.). Book, London: Sage.

Stankov, L., & Lee, J. (2014). Quest for the best non-cognitive predictor of academic achievement. *Educational Psychology*, *34*(1), 1–8. https://doi.org/10.1080/01443410.2013.858908

Sullivan, A. (2001). Cultural capital and educational attainment. *Sociology*, 35(4), 893-912. DOI: https://doi.org/10.1017/S0038038501008938

Sullivan, A. (2006). Pupils as rational decision-makers: the question of beliefs and attitudes. *London Review of Education*, *4*(3), 271–290. https://doi.org/10.1080/14748460601043965

Svanum, S., & Bigatti, S. (2006). Grade Expectations: Informed or Uninformed Optimism, or Both? *Teaching of Psychology*, *33*(1), 14–18. https://doi.org/10.1207/s15328023top3301_4

Tharp, R., & Gallimore, R. (1991). A theory of teaching as assisted performance. In R. Tharp & R. Gallimore (Eds.), *Learning to Think*. Book Section, New York: Cambridge University Press.

Trautwein, U. and Lüdtke, O. (2007). Epistemological beliefs, school achievement and college major: a large-scale longitudinal study on the impact of certainty beliefs. *Contemporary Educational Psychology*, 32, 3, pp. 348-346.

Van de gaer, E., De Fraine, B., Pustjens, H., Van Damme, J., De Munter, A., & Onghena, P. (2009). School effects on the development of motivation toward learning tasks and the development of academic self-concept in secondary education: a multivariate latent growth curve approach. *School Effectiveness and School Improvement*, *20*(2), 235–253. https://doi.org/10.1080/09243450902883920

Wiliam, D. (2011). What is assessment for learning? *Studies in Educational Evaluation*, *37*(1), 3–14. https://doi.org/10.1016/j.stueduc.2011.03.001

Wouters, S., De Fraine, B., Colpin, H., Van Damme, J., & Verschueren, K. (2012). The effect of track changes on the development of academic self-concept in high school: A dynamic test of the big-fish–little-pond effect. *Journal of Educational Psychology*, *104*(3), 793–805. https://doi.org/10.1037/a0027732

Zimmerman, B. J. (2000). Self-Efficacy: An Essential Motive to Learn. *Contemporary Educational Psychology*, *25*(1), 82–91. https://doi.org/10.1006/ceps.1999.1016

Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-Motivation for Academic Attainment: The Role of Self-Efficacy Beliefs and Personal Goal Setting. *American Educational Research Journal*, *29*(3), 663–676. https://doi.org/10.3102/00028312029003663

Notes

[i] See for example the Fischer Family Trust at http://www.fft.org.uk/fft-aspire/target-setting.aspx.

[ii] Specifically we include all schools in the postcode areas AL, B, BA. BR, BS, CH, CR, CV, CW, DE, E, EN, GL, HA, HP, IG, KT, L, LE, LU, M, MK, N, NG, NN, NW, OL, OX, RG, RH, RM, SE, SG, SK, SL, SM, ST, SW, TW, UB, W, WA, WD WR, WS, WV subject to selection criteria.

[iii] Using data for all schools in the country made no difference to our results.