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EVERYONE STARTS WITH AN 'A'

Applying behavioural insight to narrow the socioeconomic attainment gap in education

NATHALIE SPENCER, JONATHAN ROWSON, LOUISE BAMFIELD
MARCH 2014

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3 ways to use behavioural insight in the classroom
A guide for teachers and school leaders
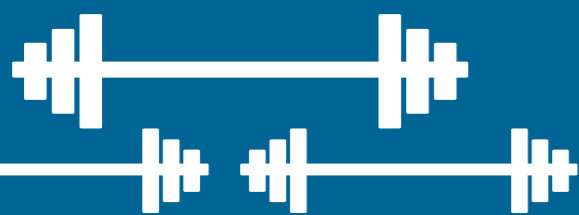
Mindset
Think about ability like a muscle that can be strengthened

Whether you and your pupils believe that academic ability is an innate trait (a 'fixed mindset') or can be strengthened through effort and practice like a muscle (a 'growth mindset') affects learning, resilience to setbacks, and performance.

The way that you (and parents) give feedback to pupils can reinforce or attenuate a given mindset.

Try:

- Praising pupils for effort instead of intelligence to help instil the idea that effort is key and intelligence is not a fixed trait. For example, try "great, you kept practicing" instead of "great, you're really clever".
- Becoming the lead learner. Educators can shape mindset through modelling it for the pupils.
- Giving a "not yet" grade instead of a "fail" to set the expectation that with the right support and mindset, a struggling pupil is not destined to perpetual failure.

Cognitive biases
Our judgements and thinking patterns might surprise us

We have thinking tendencies (biases) such as: seeking out information to support what we already believe (confirmation bias), over-valuing information we receive early on in an evaluation (anchoring and the halo effect), and feeling the pain of a loss more acutely than the pleasure of a similar gain (loss aversion).

These tendencies can affect learning of subject content, your (and your pupils') evaluation of their ability, and effort levels.

Try:

- Perspective-taking exercises, for both pupils and teachers, to mitigate the confirmation bias and halo effect, providing a more balanced view of the subject or of other people.
- Structuring incentives to evoke loss aversion. Consider having each pupil start with an "A" or a number of gold stars, with points or stars docked when appropriate.
- Discussing cognitive biases with colleagues and pupils. Recognising these tendencies is often easier to do in others than in ourselves. Greater discussion around how we think may help raise awareness without seeming like a personal attack on the person exhibiting the bias.

Surroundings
Cues in the classroom environment matter

Subtle and not-so-subtle cues can affect effort levels, ability to effectively manage major issues, aggression levels, and test scores.

Priming students with exposure to words associated with intelligence has been shown to improve test scores, as has priming with the letter "A" on top of a quiz. Visible signs of poverty might increase impulsivity, or preferring a small reward in the short term over a larger reward in the future. Views of nature or 'green space' may reduce mental fatigue and reduce aggression.

Try:

- Priming with grades and intelligence cues for example by asking students to place an "A" on their exams, potentially affecting effort and performance.
- Providing a green view from the classroom or keeping potted plants indoors, to help regulate certain dispositions and reduce mental fatigue.
- Ensuring school buildings are adequately maintained and physical signals of poverty are minimal. This may help to prevent a culture of short-termism and impulsivity.

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About the RSA

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The Vodafone Foundation is one of the large company-related foundations in Germany and a member of a global family of foundations. As an independent, non-profit institution and socio-political think tank, it supports and initiates programmes with the goal of providing impetus for social progress, of fostering the development of an active civil society and of assuming socio-political responsibility. Focusing on the fields of education, integration, and social mobility, the Foundation's mission is to recognise challenges and chances, to give support and eventually to make a difference.

Acknowledgments

Executive summary

The *socioeconomic attainment gap*, or the average difference in performance between pupils from relatively affluent backgrounds and pupils from relatively disadvantaged backgrounds, is a major social and educational policy challenge.

Despite recent success in addressing the issue, this gap is still pronounced in Germany and England, where, at age 15, advantaged students score higher on the international PISA (Programme for International Student Assessment, 2012) exam, on average, than their disadvantaged counterparts. This difference is equivalent to roughly one year of schooling (OECD 2013b, 2013c).

Behavioural insight may provide a fresh perspective on existing practice…

Educational disadvantage is a complex issue with multiple and often mutually reinforcing drivers, making it a challenging problem to understand and address. In both Germany and elsewhere, initiatives are generally focused on structural provision such as extending the length of the school day or early years' education provision. We do not suggest replacing any of these initiatives wholesale but improving and complementing them through *behavioural insight,* to provide a fresh perspective on existing practice that potentially offers scientifically grounded and relatively low-cost interventions with an aim of improving pupil performance across the board, but especially among economically disadvantaged pupils.

Behavioural science principally comprises behavioural economics and social psychology, but is also informed by a variety of other disciplines. The core insight from this perspective is that our common sense notion of what influences our behaviour is often significantly at odds with experimental evidence. While much of policy and practice is premised on the idea that behaviour is based on rational choices by autonomous individuals, research indicates that most of our behaviour is socially influenced and happens automatically, often triggered by environmental cues.

We suggest that there are several related reasons why the application of behavioural insight to educational policy and practice is important:

Perhaps most importantly, behavioural science may shed light on effective teaching and learning processes. As a school system such as Germany's moves along its school improvement journey, propelled by policy and infrastructure changes, from 'poor' and 'fair' towards 'good', the policies and initiatives needed to sustain that improvement and move up to the next level of 'great' or even 'excellent' performance should focus in greater detail on the nature and quality of teaching and learning processes. We believe that the behavioural insights reviewed in this report go some way to improving these processes through a better understanding of how effort, learning enjoyment, resilience, expectations, and evaluations are influenced in ways not traditionally recognised.

… offering a better understanding of how effort, learning enjoyment, resilience, expectations, and evaluations are influenced in ways not traditionally recognised

Secondarily, behavioural science helps us to understand where a school system may be experiencing cognitive barriers to continuous substantial change, beyond an initial set of reforms. Additionally, a deeper appreciation for some of the surprising quirks of human nature should, prima facie, help to improve practice, especially when such insights are applied to the design of teachers' professional learning and development.

We offer a range of recommendations for educators, such as teachers and school heads, for ways of working with a particular behavioural insight, headlines for which are listed below following a description of each insight.

The recommendations are grounded in behavioural science theory and evidence, and also have been developed with support from teachers and academic experts with whom we engaged via discussions, one-to-one interviews, and group workshops in Berlin and London, improving the usefulness and practicality of the recommendations in the classroom.

The recommendations are inclusive, in the sense that they can and should be applied to an entire class rather than to specific individuals. While there is good reason to believe that most of them could benefit all students to some extent, it is plausible that there will be a disproportionate benefit to socioeconomically disadvantaged pupils for a number of reasons. There may be a greater benefit to groups who have the most room for improvement, in the same way that the same healthy diet regime would probably benefit both a trim person and an overweight person, but would potentially make a larger difference to the latter. Additionally, some of the behavioural insights help to interrupt patterns of low expectations about stereotyped or stigmatised groups, such as relatively socioeconomically disadvantaged pupils, while others help to explain some of the subtle influences that areas of deprivation may have on various dispositions to learning. While we cannot claim to know with certainty that these recommendations will potentially benefit socioeconomically disadvantaged students more than others, the above arguments give us good reason to think that they might.

At the heart of this paper, we review three behavioural insights in detail and provide associated recommendations as a starting point for discussion. Specifically, we examine: the role of mindsets, the effect of cognitive biases, and the influence of surroundings:

1. Mindsets

Whether pupils and educators believe that academic ability is a stable and innate trait (a 'fixed mindset') or can be expanded through effort and practice (a 'growth mindset') has implications for pupils' learning. When faced with setbacks those with a growth mindset have higher resilience than fixed-mindset pupils, are willing to persist longer with tasks and enjoy them more. In addition to these clear advantages, growth mindsets are also directly associated with improved performance. Fostering a growth mindset in all pupils may help to reduce the disparity in educational performance in two ways. First, while a growth mindset

may be similarly beneficial for both low-performers' and high-performers' psychological *wellbeing*, there is simply more room for improvement in *performance* among low-performing groups. Second, and on a more profound level, a growth mindset can help break through stereotypes (held by both pupils themselves and their teachers) and subsequent expectations about ability and performance, because it provides an understanding that ability is not a trait which is ascribed to a person, but rather can grow through practice and persistence.

A growth mindset can help break through stereotypes and subsequent expectations about ability and performance

To promote growth mindsets, educators should consider the following:
- Praising pupils for effort instead of ability or intelligence; praising for the process of the learning instead of the outcome
- Having the teacher become the lead learner to model a growth mindset
- Giving a 'not yet' grade instead of a 'fail'
- Positioning wrong answers as an opportunity to learn more, to think about the process, and as natural to the learning journey
- Building mindset into assessments of pupils
- Building mindset into assessments of educators

2. Cognitive biases

Most of us would like to think that we make rational, calculated, carefully weighed judgments and decisions. However, a key insight from behavioural science is that we are susceptible to *biases* in our thinking; the word bias here is used to describe the *systematic deviations* in our judgments and evaluations from what we would expect given the careful deliberation we erroneously believe ourselves to conduct. In this report we consider the relevance of the following biases:

- Anchoring, the tendency to overvalue an initial piece of (potentially irrelevant and arbitrary) information in an evaluation and insufficiently adjust this evaluation away from the anchor, can influence pupil's self-efficacy which can subsequently affect their actual performance. For example, when asked about his beliefs about his future performance, a student 'anchored' on a high number may overestimate his ability (relative to someone 'anchored' on a low number), and this estimation might positively affect his actual performance.
- The halo effect, related to anchoring, happens when we focus on the first attributes we encounter in another person, largely ignoring the others, and gives sense to the adage 'first impressions last'. Teachers' impressions of pupils in the first days or weeks of the academic year may have undue weight on their continuing evaluation of them throughout the year, and pupils may behave and perform in response to how they see themselves in the teacher's eyes.
- The confirmation bias describes our tendency to interpret and seek out information to support our pre-existing beliefs. Crucially, together with the halo effect, the confirmation bias may have a profound effect on both teachers' and pupils' beliefs about the nature of ability and reinforce unchallenged

assumptions or negative stereotypes about academic performance.

- Loss aversion, where we feel the pain of a loss more acutely than the pleasure of a similar gain, has been used to explain interesting findings regarding the role of incentives on pupil performance. Instead of promising a pupil a reward after they achieve a stipulated goal, framing an incentive as a *loss* (for example by offering it to a pupil *before* a test with the condition that if they don't meet certain criteria the pupil will have to give the reward back) has been show to improve test scores. Incentives need not be financial, and indeed one of our recommendations set out in this paper is to explore the effectiveness and practicality of having everyone in a class start the year with an A grade, which, in order to keep, they must continuously improve their performance. Teacher reactions to this proposal are discussed in section 5.

Cognitive biases can affect learning, effort, expectations and evaluations

Taken together, these cognitive biases can affect pupils' learning of subject content, influence the amount of effort exerted on academic performance, and shape teacher and pupil expectations and evaluation of pupil ability.

To work with cognitive biases, educators should consider the following:

- Engaging in perspective-taking exercises, for both students and teachers
- Structuring incentives to evoke loss aversion ("everyone starts with an A")
- Having the entire class defend a grade
- Distinguishing between evidence-weighing and case-building, and praising pupils for inclusion of counter-arguments
- Discussing the relevance of such biases on a regular basis to promote learning reflexivity
- Praising the process of an evaluation, not the outcome

3. Surroundings (environmental cues)

Subtle and not-so-subtle cues in our surroundings can affect pupils' effort levels, ability to effectively manage major issues, aggression levels, and test scores. The evidence in this area is significant, and while it is harder to be sure of the degrees of the effects, the relative ease of the interventions makes them worth considering closely. For example, priming students with exposure to words associated with intelligence has been shown to improve test scores, as has priming with the letter 'A' on top of a quiz. Cues of poverty have been found to increase impulsivity, or preferring a small reward in the short term over a larger more lucrative reward in the future; interestingly this impulsivity may be a rational strategy in situations of unreliability (as is often the case with poverty), given that there is a risk that the promise of the larger reward in the future may never actually materialise. Schools showing physical signs of distress may therefore reinforce or compound existing causes of educational disadvantage. Views of nature or 'green space' have been found to reduce mental fatigue and reduce aggression. Ensuring a green view from the classroom

may not just be a 'nice to have' but could be part of the effort to improve performance through mental restoration.

To get the best from surroundings, educators should consider the following:
- Considering the use of priming with letter grades and intelligence cues
- Providing a view of green space from the classroom or positioning plants within it
- Advocating for school buildings and classrooms to be maintained to an extent where physical signals of poverty are minimal

The recommendations we offer are designed to start a discussion. Given what we know from behavioural science about the cognitive processes involved in teachers' professional learning, it is unlikely to be sufficient simply to inform teachers about 'cognitive biases' or 'growth mindsets'. For teachers to apply these insights effectively will require support from head teachers and system leaders, both informally by creating the space to discuss these findings with colleagues and challenge their own assumptions about particular pupils or groups of pupils, and formally by incorporating this information into a structured programme of professional development.

There is evidence to suggest that teachers who are cognitively literate and armed with ideas and techniques grounded in behavioural science are likely to have better outcomes

While the formal support must be offered by school heads or system leaders, to help create the informal support, Vodafone Stiftung Deutschland has developed a forum for discussion at www.lehrerdialog.net. We invite educators to visit the site to discuss the topics explored in this report and to share their own experience, tips and ideas with other members of the teaching community.

We intend this report to be a provocative starting point both to explore the application of behavioural insight to narrow the socioeconomic attainment gap, and to help create a culture of cognitive literacy or 'behavioural insight awareness' among teachers. As this paper demonstrates, there is evidence to suggest that teachers who are cognitively literate and armed with ideas and techniques grounded in behavioural science are likely to have better outcomes. The injunction of self-questioning and self-awareness implied by behavioural insight may improve teachers' performance and the relationship between teachers and learners, and it is here that behavioural insight could have a substantial systemic impact on educational practice.

Introduction

Imagine a classroom where all of the pupils started off an academic year with an 'A' grade, and in order to keep the grade, a pupil had to show continuous improvement throughout the year. In this classroom, the teacher would have to dock points from a pupil's assessment when their performance or achievement was inadequate, and pupils would work to *maintain* their high mark rather than to *work up* to it. How would this affect effort, expectations, performance, and assessment relative to current practice? This is one of the questions we pose in this paper as we explore the application of behavioural insight to educational policy and practice.

The term *behavioural insight* is used in this paper to describe the practical application of ideas and evidence arising from behavioural science, which principally comprises behavioural economics and social psychology, but is also informed by a variety of other disciplines. Perhaps the core insight from behavioural science is that our common sense notion of the things that influence our behaviour are often significantly at odds with experimental evidence. While our traditional understanding of behaviour is that it is individually chosen and enacted, research indicates that much of our behaviour is socially influenced and happens automatically, often triggered by environmental cues.

In general terms, we believe that applying behavioural insights to educational policy and practice is instructive on two levels. On one level, behavioural science is a useful lens through which we can view the general reaction to the PISA 2000 results over a decade ago and the subsequent space for discussion and reform, helping to elucidate potential barriers to the deep reflection and critical engagement arguably required for further improvement in reducing educational inequality. On another level, and where we focus most of our attention in this paper, behavioural insight is an important piece of the puzzle because it reveals much about the cognitive processes that are at the heart of teaching and learning.

While most proposed attempts to narrow the attainment gap focus on levers within the classroom or school, our approach looks more directly at student and teacher cognition, as an emergent property of educational experiences, environment and expectations. More precisely, we explore whether there are forms of behavioural insight, grounded in recent shifts in perspective on how people form judgments, learn, and take decisions, that might help to close the attainment gap.

With this in mind, we seek to offer a better understanding of the effects of the following on both pupils and educators:

- *Shifting mindsets* that see ability as a fixed trait rather than something that can be improved with practice
- *Understanding cognitive biases* that systematically influence how teachers and students process information and make judgments, and

- *Improving environmental cues*, both small (such as exposure to words associated with high performance) and large (such as poverty or green space)

Many of the behavioural science concepts explored here are not new, but what is new is a growing appreciation for how they can be applied in policy and practice. Notably, governments are increasingly looking to draw upon insights from behavioural science to inform policy design, especially in the context of severe public spending restrictions. For example, the UK's Behavioural Insight Team, also known as 'the nudge unit', is using a better understanding of human nature rooted in behavioural science to improve the effectiveness of initiatives by trialling relatively low-cost design tweaks.

There are two important points to keep in mind about the endeavour to apply behavioural insight to the challenge of equality in education. The first is that examining the attainment gap from this perspective does not in any sense seek to replace other approaches that place more direct emphasis on, for instance, institutional change, distributive justice, or changes in pedagogy, curriculum or assessment. The point is rather to create among teachers, school leaders, and policy makers a culture of awareness about behavioural insight so that it can be used to complement, inform or strengthen the existing approaches to tackle educational disadvantage.

The second point is that it might legitimately be asked why, prima facie, we think such an approach could help to close the attainment gap, rather than improve outcomes commensurate with existing patterns of disadvantage, or even compound the gap if more advantaged students derive more benefit from these approaches than those they are designed for. The only compelling answer here would be an empirical one, based on carefully controlled experiments. In lieu of such evidence, in each case below we have tried to ground each idea and prospective intervention in a way that we believe might have particular benefit for relatively disadvantaged students. The proposed practical steps are inclusive, in the sense that they can and should be applied to an entire class rather than to specific individuals. However, while there is good reason to believe that most of them could benefit all students to some extent, we have also selected the interventions that are likely to have larger effects on those who are relatively socioeconomically disadvantaged, with a view to narrowing the attainment gap.

Methodology

This report calls upon a variety of techniques to explore the potential of applying behavioural insight to educational policy and practice, and providing practical recommendations grounded in conversation with educators and expert academics in relevant fields. We conducted a review of the literature, followed by conversations with academic experts on student motivation in Berlin, Germany, including Professors Ulrich Trautwein and Ellen Schaffner. To elicit views and attitudes of educators, we conducted two focus groups. The participants were teachers of various subjects and with various levels of experience in Berlin, Germany. Additionally, via the YouGov Teacher Track omnibus, we conducted an

We seek to create a culture of awareness about behavioural insight so that it can be used to complement, inform or strengthen the existing approaches to tackle educational disadvantage

online survey with a nationally representative sample of 759 teachers, to gain insight into attitudes and practices of educators in England. To support comparisons between the German and English educational landscape, the paper draws heavily on a publication of 1:1 interviews conducted by Institut für Demoskopie Allensbach earlier this year, on behalf of Vodafone Foundation Germany, to draw out perceptions of teachers, parents and pupils about systemic inequality of opportunity afforded to pupils of different social classes. We also interviewed Professor Carol Dweck, a world-renowned expert on social and developmental psychology, as part of her visit to the RSA to speak about 'How to Help Every Child Fulfil Their Potential'.

Structure of the report

In *Section 1*, we describe the PISA shock and how the reactions and responses by policy makers, educators, and the general public can be viewed through the lens of behavioural science.

In *Section 2*, we show how early childhood disadvantage is often compounded by school-age disadvantage, and how an important part of this story is the relationship between teacher and learner. We also briefly summarise the policy responses to educational disadvantage in Germany and England, and review teachers' impressions about the nature and scale of the socioeconomic attainment gap.

Section 3 is a short introduction to Sections 4, 5 and 6, where we draw out some key insights from behavioural science, and show how these might be applied to the education context. Specifically, in these sections we explore:

- *Section 4*: how deep underlying assumptions about the nature of intelligence and academic ability affect pupils' enjoyment in learning, resilience, and performance
- *Section 5*: how systematic biases in judgement might affect learning of subject content and pupils' effort levels, but perhaps more profoundly, also influence evaluations and expectations about learner performance
- *Section 6*: how physical aspects of the learning environment may be influencing the disposition to learn

Each of the three aforementioned areas is discussed in depth, backed with examples and evidence from academic literature. After each area is described, educator perspectives are explored, and practical recommendations are provided. To ensure that the recommendations are not only grounded in theory but also useful and practical in the classroom, they have been developed with support and input from teachers and education experts, gathered via workshops, interviews, and a survey.

In *Section 7,* we describe how key findings from educational research, together with insights from behavioural science and social psychology, can help us to get inside the 'black box' of teaching and learning, by uncovering the core cognitive processes involved in both student learning and teachers' professional learning.

1. The PISA shock

As is now widely known, the publication of the results of the PISA 2000 study was an important catalyst for education reform, as the resulting 'PISA shock' forced many Germans to question the standard assumption that they had one of the best and most equitable education systems in the world (OECD 2001). The news, surprising at the time, was that educational inequality was endemic, as was evident in test scores showing that pupils from affluent backgrounds were scoring significantly higher than pupils from disadvantaged backgrounds, and that the background of students directly affected their opportunities for further education. German educational policy and practice has undergone significant reform since the early 2000s and made substantial progress in addressing this inequality. Even so, despite the improvement thus far, Germany and many other developed countries still struggle to address a persistent attainment gap, and there is a need to build on success.

Our goal in this report is not to challenge the standard account of the 'PISA shock' as an important catalyst for education reform, or to disrupt the image of Germany as a PISA success story. As its steady improvement and movement up the international league tables demonstrates, Germany has made welcome and necessary progress over the last decade in boosting the attainment of its lower achieving students and thus narrowing the gap in pupil performance. As such, the programmes of reform enacted across the country have much to contribute to our growing understanding internationally about what works, in different contexts, to tackle the achievement gap between students from different socioeconomic backgrounds.

Rather than simply repeating the conventional story, however, there is much that can potentially be learned from taking an alternative perspective. In the case of the German 'PISA shock', we suggest that behavioural insights reveal a more nuanced picture of the depth of learning that has arguably taken place, highlighting some potential barriers to deeper reflection and critical engagement amongst different participants and audiences: policy-makers and political leaders; school principals and teachers; and members of the wider public.

Initial public reaction to PISA

There is no doubt that the PISA 2000 results, covered at length in the pages of the national newspapers, created a genuine sense of shock and surprise across the nation. By challenging so publicly the dominant popular image of the country's school system, it forced the German public to confront a set of core beliefs and commonly held assumptions. As media coverage of the time recounts, many members of the public were actively engaged in the public debate that followed, as they

struggled to make sense of information that was so incongruent with their pre-existing beliefs.

The PISA experience thus created a shared experience of cognitive dissonance,[1] which needed to be resolved individually and collectively by finding an interpretation or diagnosis that could make sense of what had happened. As is now well recognised, moments such as these can provide powerful learning opportunities, by challenging tacit knowledge and understanding and creating tension – which in the right circumstances allows us to confront uncomfortable truths rather than shying away from them. But these moments can also be difficult, as the tension of holding competing cognitions simultaneously can be mentally taxing. For most of us, most of the time, it is simply easier and less mentally demanding to continue believing something than to actively change a belief (discussed in greater detail in section 5). In the case of the PISA study, one way to resolve the sense of dissonance would have been to challenge the validity of the data (eg by casting aspersions on the methods or research design), as happened elsewhere.[2] However, the credibility of the OECD within Germany (Knodel et al. 2013) contributed to a general acceptance of the 'facts', and hence created the need to resolve the dissonance by *accepting* rather than *rejecting* the central premise.

Response from policy-makers

For long-standing critics of the tripartite secondary school system, Germany's disappointing performance in the first PISA assessment was a perfect chance to press the case for structural reform. For advocates of greater school autonomy and accountability, meanwhile, the PISA results were similarly an obvious opportunity to advance the arguments for devolving greater responsibility to schools and making more information available to hold schools to account.

Setting aside the political arguments about the efficacy and fairness of different types of school systems, what is striking about the response from campaigners on both sides was the very natural tendency to interpret or diagnose the problem from a pre-existing perspective, and to use the new information presented to them to support their own preferred solution (OECD 2011).

We do not mean to suggest that the PISA results were in any way misused or manipulated to make the case for particular reforms (though it is always worth closely scrutinising the quality of evidence put forward to justify a particular policy or intervention). And it is worth noting that this type of response is not peculiar to policy advocates and campaigners: while most of us are inclined to uphold an image of ourselves as rational deliberators, carefully weighing the evidence for and against, behavioural

1. Cognitive dissonance is the internal tension or discomfort we feel when holding competing views, when our actions do not match our self-perception, or when we learn information that is not in line with our existing values and belief system. We are motivated to resolve this tension or discomfort, and do so in various ways including but not limited to rationalisation, rejection of discordant information, or changing our beliefs.

2. Noticeably, not all countries who have scored poorly in the PISA league tables have been willing to accept the truth of the findings; commentators in Latin America, for example, have remarked upon the reluctance of Argentina's federal government to accept the need for reform of the education system, despite ranking near the bottom (58th out of 65) in the 2009 PISA rankings (Oppenheimer 2010).

Everyone starts with an 'A'

science reminds us that we are all susceptible to biases in our thinking, such as seeking out information to support pre-existing beliefs (known as 'confirmation bias'), over-valuing certain types of information, such as that presented early in an evaluation ('anchoring' and the 'halo effect'), or feeling the pain of a loss more acutely than the pleasure of a similar gain (loss aversion), all discussed in section 5.

The implications for teachers

PISA results were perhaps particularly uncomfortable for those in the teaching profession, challenging their long-established status and esteem as a highly trained and skilled profession. Although teachers in general tend to be naturally cautious when it comes to sweeping educational reforms, especially if they appear to threaten employment security, pay, or conditions, in the German case, the negotiating power of the teaching unions has protected teachers from policies such as performance related pay which have become common place elsewhere (OECD 2011). However, in general, the response from teachers appears to have been positive: Germany's improvement since the early 2000s is seen as evidence of teachers' professionalism, in focusing greater attention on the learning needs of particular students.

Reassessment of core values and assumptions

While the widespread media reporting and strong public reaction clearly created the space for education reform to be proposed, deliberated and negotiated, it is possible that for many, cognitive frugality has prevented or tempered deeper critical reflection. We may at times be forced to concede a debating point, but do not shift the general thrust of our argument and assumptions very easily.

It is therefore worth asking how far the subsequent discussion and analysis led people – the public, policy makers, and educators – to reassess the core values and beliefs underpinning their views of a fair school system, or indeed to reappraise their underlying views and attitudes towards people from poorer backgrounds who tend to suffer most from educational disadvantage. Similarly, it is worth asking how far the political processes of deliberation and negotiation that followed – carefully balancing a range of competing professional and political interests – allowed for the 'root and branch' review of the German school system that was arguably needed.

Although potentially uncomfortable, such questions are worth asking because of what we know from behavioural science about the importance of adopting a 'growth' mindset rather than taking a 'fixed' view of people's cognitive ability, particularly given what attitudinal research reveals about the strong tendency of people, regardless of class position, to ascribe negative character traits to those perceived as being from poorer and more disadvantaged backgrounds (Bamfield & Horton 2009). And while Germany's improved performance in each subsequent wave of the study has allowed those involved to claim the success of their preferred policies or reforms, there is a danger that as the fear of poor performance fades, the pressure for deep reflection about the causes of educational disadvantage will similarly be eased.

On the whole, the shocking results of PISA 2000 helped to spur action through what may have been a collective need to make sense of the

As the initial dissonance is starting to be resolved, the taxing nature of challenging deep-seated views may be preventing a wholesale adjustment of underpinning beliefs and values

information which was so incongruent with widely held beliefs about the strength and equality of the education system. But as the initial dissonance is starting to be resolved through the reform that has happened thus far, the taxing nature of challenging deep-seated views may be preventing a wholesale adjustment of underpinning beliefs and values, both about particular children or groups of children, and about the inherent fairness of a highly differentiated, selective and segregated school system which reinforces cultural beliefs regarding the construct of academic ability.

These themes are discussed further in section 7, where we draw together behavioural insights with an established body of research evidence on teachers' professional learning and development, to describe how creating dissonance as part of structured programmes of professional development can be one of the most powerful ways of promoting teachers' professional learning, particularly for experienced teachers.

Everyone starts with an 'A'

2. Understanding educational disadvantage

The following section provides important background context for the suggested interventions that follow, but readers already familiar with the literature on the socioeconomic attainment gap may wish to skip this section and go directly to section 3.

The OECD PISA study and other international datasets show that in all participating countries it is possible to identify groups of children and young people – typically those from socially or economically deprived family backgrounds – who have a higher risk of experiencing low attainment and other types of educational disadvantage than their peers. What varies between countries is the nature and scale of disadvantage.

For Germany, the nature of educational disadvantage is characterised by three dominant features:

- the country's steep socioeconomic gradient in attainment by socioeconomic status (SES), meaning that differences in a pupil's SES (as measured by the OECD's ESCS Index which captures differences in families' economic, social and cultural resources) are correlated with a large difference in performance
- high levels of regional variation, with large differences in achievement across German Lander
- the wide gap in performance between 'native' students and those with an immigrant background, which, however, does not exist when SES is controlled for. Because pupils with an immigrant background are more often of a low SES group than their 'native' classmates, the performance gap likely reflects the achievement effects of SES and differences in language proficiency

Although significant progress has been made in enhancing outcomes for students from disadvantaged backgrounds, there is still room for improvement. According to the latest PISA results, Germany has improved in terms of equality of opportunity in education, but there is still a significant performance gap between high-SES students and students from socioeconomically disadvantaged backgrounds. A high-SES student scores on average 43 points higher in Maths than a socioeconomically disadvantaged student. The corresponding OECD average is 39 points,

which is approximately equivalent to one year of schooling (OECD 2013b).[3]

Even at a given performance level, inequalities persist; students of equal ability but from different social classes have different likelihoods of attending the Gymnasium. "Even when students in primary school were equally matched in terms of actual achievement, those whose parents had attended Gymnasium were three times more likely to be sent to a Gymnasium than those whose parents had gone to a Hauptschule" (Pearson n.d.). An OECD report from 2011 entitled 'Strong Performers and Successful Reformers in Education' argues that "this [inequality despite performance level] undermines the assumption by German educators that the choice of secondary school is based solely on achievement in elementary school. The fact that this was not the case showed that the system is manifestly unfair. For a number of reasons, it systematically denies opportunity to those whose parents are from the lower classes" (OECD 2011 p.209). In section 5 of this paper we examine the possibility that cognitive quirks such as the halo effect and confirmation bias may be influencing teachers' impressions of pupils and their subsequent recommendations for which secondary school a pupil should attend.

In England, the largest divide in education outcomes remains between pupils from different socioeconomic backgrounds (DfE 2012). The scale of the challenge here is significant: despite heightened government efforts since the late 1990s, only limited progress has so far been made. At age 11, pupils from poorer families (as indicated by eligibility for Free School Meals) are still on average some twenty points behind their classmates, while there is a stubborn performance gap of 27 points at age 16 (DfE 2012). More positively, levels of low attainment amongst almost all minority ethnic groups have improved significantly over the recent period (DfE 2012).

Understanding the drivers of educational disadvantage

The SES attainment gap reflects a combination of different mechanisms – structural, economic, psychological and cultural – through which children's circumstances hinder them

What accounts for this marked difference in learning outcomes? Importantly, the SES attainment gap is not an indication that disadvantaged students are less academically 'able' than advantaged students. Rather, it reflects a combination of different mechanisms – structural, economic, psychological and cultural – through which children's circumstances hinder them from reaching their potential and from attaining the same level of educational success as their advantaged peers. Research reveals that children's socioeconomic background can affect their capacity to flourish in school in numerous and often mutually reinforcing ways, beginning with factors in the home environment and then extending to opportunities for learning in the local neighbourhood and in formal schooling (APA 2013):

Family level factors
The first way that social class affects a child's learning is through the family's level of resources, including levels of household income, parental education, and occupational status, as well as social and cultural capital.

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3. A rough rule of thumb is that 40 score points is approximately equivalent to one year of schooling (Jerrim 2013).

Social capital is a complex notion, but has been succinctly defined by Sociologist Robert Putnam as 'social connections and the attendant norms and trust' (Putnam 1995). The claim here is that more affluent families tend to have wider networks of trusted people and institutions, and those networks are imbued with norms relating to growth and learning that have educational value for developing children. Cultural capital is also a contested notion, but in this context manifests in the form of relatively easy access to books, art, music, and other cultural material which augments the child's general disposition towards ideas, and which may be weaker for disadvantaged children. Although disentangling the effects of multiple factors is complex, research highlights the important mediating role played by *family processes*, focusing in particular on parenting style (eg calm, caring and consistent parenting vs. harsh, authoritarian parenting and inconsistent discipline) and levels of parental involvement in children's early learning, through activities such as reading, painting and drawing, teaching nursery rhymes, playing with shapes and numbers, and singing (Sylva et al. 2003).

Differences in the home environment are often compounded by unequal access to enriching learning experiences outside the home

What matters most for children's development is the extent to which parents are able to provide a safe, caring and stimulating 'home learning environment', which gives children the attention and security they need to develop their learning capacities by exploring and interacting with the world around them. In this sense, *what parents do* with their children at home in the early years, rather than *who they are* (ie their income level or occupational status) has been shown to be more significant than any other factor open to educational influence (Desforges and Abouchaar 2003).[4]

A second important pathway through which social class can affect students' educational attainment is through its effect on their *psychological health*. Stress caused by financial insecurity, debt, poor housing quality, fear of crime or concerns about physical safety, as well as family or relationship turbulence, can all create emotional distress that undermines individual attainment. Low-SES parents are also more likely to experience post-natal depression and other forms of mental ill-health, lower perceived control, or chronic stress which can influence children through the diminished quality of relationship that can result (Marmot 2010; Jensen 2009).

These differences in the home environment are often compounded by unequal access to enriching learning experiences outside the home, particularly those provided by high-quality early childhood education and care. While good quality provision should ideally be available for all children, it is particularly important for children from deprived backgrounds, since it has a disproportionately large positive impact on their early learning and development (Sylva et al. 2003).

School level factors
This double (or even triple) disadvantage for poorer children helps explain why a marked gap in children's cognitive, social and emotional

4. Having higher levels of income and higher educational qualifications clearly does not always make for better parenting, and conversely, having lower income and fewer qualifications does not automatically mean that people will be poor parents. Nevertheless, parents with greater assets and resources, both material and non-material, are generally better able to provide access to stimulating and enriching activities within the home, as well as affording a greater range of educational experiences and services outside the home.

development is clearly evident even before they start school. Beginning school with good language and communication skills and a basic understanding of letters and numbers can then make it much easier for children to flourish in primary school, affecting their confidence and self-perception as a 'good' or 'able' pupil. Conversely, having poor vocabulary, comprehension or other forms of language delay (which may be exacerbated for non-native speakers), poor social skills and low levels of confidence all have negative effects on children's early learning.

Disparities in resources are also manifest at the school level: although total levels of investment and the distribution of resources vary widely between and within countries, more deprived localities tend on average to have a lower-quality and under-resourced school environment, which can enlarge and perpetuate the educational attainment gap (Jensen 2009). This may mean that the school has a shortage of materials, a lack of library books, inadequate technology; or that the school building itself is run down, showing signs of poverty or structural distress, shortage of space, or located in an area without the associated cultural institutions (eg libraries, sports centres) that are often more readily available in more affluent communities.

Arguably the greatest disparity lies not in the physical infrastructure and built environment, but in access to the most important resource – namely, excellent teaching from highly engaged, motivated and well-trained teachers. Of all factors operating at school level, it is the nature and quality of the interactions between teacher and learner which makes the biggest difference to student outcomes. We propose that the quality of the relationship between teacher and learner, for example around expectations and evaluations, can be improved through the behavioural insights explored in the following sections.

The nature and quality of the interactions between teacher and learner make a difference to student outcomes

Interplay of family factors and school level disadvantage

The interplay of family and school disadvantage here is particularly important: for various reasons children from poorer family backgrounds may show less apparent readiness to take up learning opportunities, creating the impression in the teacher's mind that they are less 'able'. Whether intentionally or otherwise, teachers may then make assumptions about the child's capacity to improve, which serve to reinforce and entrench negative learning dispositions for the student. This combination of factors may then cement a set of dispositions which view learning with trepidation rather than as a source of satisfaction gained through steady progress (DCSF 2009). This interplay of factors is evident in research, which demonstrates that teachers' subjective assessment of students' cognitive abilities tend to vary in different contexts, with teachers in lower-socioeconomic status and lower-achieving contexts being more likely to underestimate their students' abilities. These negative perceptions can have important implications for classroom interactions and for children's access to enriching learning opportunities, since teachers who underestimate their students' abilities tend to use a more restricted range of instructional approaches (Ready & Wright 2013). Furthermore, research which has examined student experiences in the classroom reveal that children from more deprived backgrounds are far more likely to report negative experiences, such as being shouted at by their teachers, than

their more advantaged peers (Horgan 2007). Studies also demonstrate that children from all backgrounds see the advantages of school, but deprived children are more likely to feel anxious and unconfident about school (Sutton 2007), and those who become disaffected with school often develop strong resentments about mistreatment within the school or classroom, such as perceived racial discrimination (Hirsch 2007).

Positive transitions to adult life

Children's early experiences and relationships in the home and at school can have enduring effects on children's learning and development throughout their schooling and into adult life (Blanden 2008). As a result of low attainment, young people from deprived backgrounds are at much higher risk of leaving school early or not continuing to further education and training (Schneider 2008). Nevertheless, it is unsafe to assume that there is a corresponding gap in individual ambition and aspiration, or belief in the importance of education. Recent UK research has shown that young people from all social backgrounds may have high personal aspirations, and a strong sense of the importance of doing well at school and in later life. The important difference lies not in what people want to achieve, but in their knowledge of the specific steps needed to make it happen, and access to the kind of support and social networks that are linked to success (Menzies 2013).

This brief overview has served to highlight the complex interplay of factors operating within the home, in the local neighbourhood and in formal schooling. It follows that sustained action is needed over the life course, beginning in the early years and continuing throughout childhood and adolescence, to overcome the barriers to learning that can arise from poverty, social exclusion and other sources of social and family disadvantage, and to support young people from disadvantaged backgrounds to achieve stable transitions to adult life (Marmot Review 2010).

Policy responses to educational disadvantage

In both Germany and the UK, efforts to narrow the gap in children's education and future life chances has followed a 'raising the floor' strategy, aimed at boosting the attainment of low-SES students while maintaining or enhancing the attainment of high-SES students, thus helping to both close the attainment gap and improve overall national performance (OECD 2013a).

Within Germany, a key plank of the reforms has been efforts to improve the quality of early childhood education and care (ECEC), especially for children from lower socioeconomic or immigrant backgrounds, with a new common framework for provision, and targeted support in some Länder, such as a premium to kindergartens for immigrant children to allow intensive one-to-one language support for those whose German language skills are assessed to be inadequate (Carey 2008). Similarly, the UK Government has since the late 1990s invested heavily in both targeted and universal programmes, including a network of children's centres, designed to compensate for early disadvantage, strengthen parent-child relationships and improve children's emotional, language and cognitive development (Sylva et al. 2004).

By contrast, the school reforms enacted in each country have followed a rather different path. While the authorities in both countries have sought to increase school autonomy over budgets and staffing, along with greater accountability at the school and teacher level for student outcomes, Germany has not embraced the drive towards greater diversity in school types that has been such a dominant feature of the reform programme in England.[5] Instead, the German authorities have sought to reduce stratification and segregation within the school system through structural reforms.

The policy discourse that has framed debates about reform may be both reflecting and shaping public attitudes towards what constitutes a fair society and fair provision of services. For example, qualitative research by Martin and Taylor-Gooby (2008) shows that while both Germans and English value 'fairness', their interpretation of fairness may be different in some significant ways. Whereas the German participants placed a strong emphasis on equality of provision in public services to provide a 'common foundation for individual progress', in the UK sample far greater emphasis was placed on individual responsibility to grasp and make use of those opportunities(Martin and Taylor-Gooby, 2008, p. 8). These attitudes are interesting to note in light of the various reforms enacted in the respective countries, for example the marketisation of a core service (such as schooling) occurring in England which would most likely be met with concern from German audiences.

<div style="float:left; font-style:italic; color:#d98c2b;">It is very hard to ascribe success to any single policy or intervention</div>

Untangling the impact of different policy interventions is not easy: the nature of educational disadvantage is such that to have any hope of success, any strategy must seek to address multiple drivers at the same time, which means adopting multiple strands of activity. As a result, the interdependency of causes and outcomes (with feedback loops operating between them) makes it very hard to ascribe success to any single policy or intervention.

The need for sustained and critical policy engagement is highlighted by recent research by McKinsey (Mourshed et al. 2010), which suggests that the reforms introduced thus far in Germany are consistent with the cluster of policies adopted by other education systems who have successfully navigated the school improvement journey from 'fair to good'. But the evidence also suggests that moving from 'good' to 'great' – or even to 'excellent' requires a different set of reforms, which focus less on structural aspects of the system and more on the nature and quality of the teaching and learning processes at the heart of schooling. The behavioural insights explored in this paper may go some way towards improving critical aspects of the relationship between teachers and learners, including those around expectations and evaluations.

Teacher perceptions of educational disadvantage

Below, we review teacher perspectives of the nature and scope of the socioeconomic attainment gap, along with what factors they believe

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5. Since the early 1990s, school reforms in England have focused heavily on diversifying school provision, with the introduction of a whole raft of new school types – Specialist, Foundation and Beacon schools, along with Academies, based on the model of Charter Schools in the US and Cananda, and more recently Free Schools, based on the Swedish model. Based on a quasi-market principle, such reforms have been designed to increase parental choice and school competition and hence raise school 'standards'.

Everyone starts with an 'A'

contribute to educational disadvantage. These perspectives are drawn from both the survey we conducted in England of a nationally representative sample of teachers and a publication by Vodafone Foundation Germany (VSD 2013) of interviews conducted in Germany to draw out perceptions of teachers, parents and pupils about systemic inequality of opportunity afforded to pupils of different social classes. As the questions in the survey and the interviews were not identical, we cannot draw direct comparisons between the two countries. However, the findings are nonetheless relevant and illustrative, building on previous research which highlights important differences in how the notion of 'fairness' and equality of opportunity are interpreted in the different contexts (Martin and Taylor-Gooby, 2008).

Box 1: Is there an SES attainment gap? Is it widening or narrowing?

While in actuality the SES gap is narrowing consistently in Germany, and slightly in England,[6] teachers' general impressions of the gaps in Germany and England are mixed.

Of the German teachers surveyed, 61% were of the opinion that there is not equality of opportunity in German schools, although it should be noted that this question included gender inequalities as well as inequalities due to social background (VSD 2013).[7] This means that 39% *do* think there is equal opportunity in German schools (even despite the PISA findings), yet 82% of teachers think that the success of a pupil is influenced by their social background to a large or very large degree. The majority (54%) of German teachers believe that the difference in performance explained by social background has increased (VSD 2013), which may reflect the fact that public *awareness* has increased as a result of greater public debate and discussion of these issues.

The response of English teachers paints a slightly different picture. Of the English teachers surveyed, only 34% believe the SES attainment gap has increased over the past few years, with 12% thinking it has decreased and 42% believing that the SES gap has stayed the same. 10% don't know, and 2% believe that "generally there is no difference in performance between different social classes". Although the gap has narrowed slightly in England at the national level, there has been wide variation between localities and schools; it is therefore perhaps not surprising that many teachers would not have a very clear impression of the gap.

That relatively more German teachers think that the gap is increasing could be attributed to one or more of a number of reasons, including media portrayal and the extent to which the SES attainment gap is discussed among teachers both formally and informally. While we cannot claim to know the cause of these impressions, it is interesting to note that despite actual improvement in narrowing the gap, a significant proportion of teachers in both Germany and England believe that the gap is widening. One might assume that such subjective impressions about the gap matter less than the objective measure of that gap, but both are very important, because as we indicated below, teaching and learning is subtly influenced by teachers' subjective impressions about the learners and their prospects.

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6. The SES gap has narrowed slightly at the national level, with wide variation between localities and schools.

7. An approximate English translation of the question asked is: "how good is the overall equality of opportunity in German schools realised, so that all students, regardless of sex or social background, have the same opportunities in school?", with 61% responding either "less good" or "not good at all". Other answer options were "good" and "very good".

Factors contributing to the SES attainment gap

When asked about their impressions of the root causes behind the SES gap, teachers in Germany and England had different beliefs; however, teachers from both countries were likely to attribute the gap to various actions (or lack thereof) by parents.

For German teachers, the top three responses (and percentage of respondents who selected the response) were:

- Some parents' lack of interest to engage with their kids (84%)
- Lack of a proper upbringing for the pupil by his or her parents (77%)
- Parents lack in being a role model (75%)

For English teachers, the top three responses (and percentage of respondents who selected the response) were:

- Parents lack knowledge about how to support them (76%)
- Parents lack aspiration for them (70%)
- They lack aspiration (56%)

There is a common tendency to denigrate members of low-status groups, whilst defending the elevated position of the wealthy

Interestingly, for both groups of teachers, the top three answers are planted firmly in issues relating to parents or the student. Perhaps this indicates that as it stands, there is insufficient attention given to elements of the classroom and teaching contexts and the potential for relatively small changes within them to affect learning and evaluations. Additionally, an explanation for this finding might be that people employ 'cognitive coping strategies' to justify existing inequalities, by which they make judgements about the character or behaviour of others in ways that rationalise and justify their respective positions. For example, there is a common tendency to denigrate members of low-status groups, whilst defending the elevated position of the wealthy (Bamfield & Horton 2009, p.14).

Pupil ability

Whereas only 5% of teachers in the English sample would attribute the SES gap in part to the students' lack of talent or ability, a full 57% of the German sample selected lack of talent as a response. As noted earlier, as the questions were not identical for the German interview and the English survey, we cannot draw direct comparisons. This large difference may be due to genuine differences in opinion between the two groups of educators, or it may be influenced by differences in the questions. It is also plausible that the word 'talent' has a different connotation or meaning in the two cultures. The stark finding is nonetheless interesting, especially when viewed in light of section 4 of this paper which explores the effect of beliefs about whether ability can be developed (as compared to it being a fixed trait) on performance.

Teacher bias

In each country, only a minority of teachers consider bias or favouritism by teachers to be a contributing factor to the educational disadvantage of low-SES pupils. In Germany 15% of teachers thought that some pupils

Everyone starts with an 'A'

get favoured over others, whereas in England only 4% of teachers thought that evaluation might be biased.

In response to these findings we might echo questions posed in the section PISA Shock about how well people, including teachers, know themselves, and to what extent has 'PISA shock' led teachers to reflect upon the ways that their own teaching methods, attitudes and behaviours towards their students, may – inadvertently – contribute towards the performance gap. Section 5 of this paper explores the possibility that certain thinking tendencies, such as the tendency for first impressions of ability to endure and the tendency to seek out information that supports pre-existing beliefs, may be subconsciously and inadvertently affecting teacher evaluations of their pupils.

School environment

In the English survey, 19% think that the school's resources being less adequate than those of schools in richer areas is one of the reasons for the SES attainment gap.[8] Section 6 of this paper explores whether the school environment, above and beyond the direct effects of having inadequate resources, may have indirect psychological or behavioural effects on dispositions towards learning.

These findings around perceptions of what contributes to the SES attainment gap help us to understand the context within which educators will receive the possibility, put forth in the remainder of this paper, that there is a role for behavioural insights to influence teaching and learning, to augment existing educational reform.

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8. This option was not offered in the German interviews so we cannot draw a comparison between the two groups of educators.

3. Applying behavioural insights to improve attainment

Our research indicates that there are at least three potential areas where behavioural insight might be used to augment existing, more traditional structural and policy reform with the aim of improving student attainment among low-SES groups:

- **Mindsets.** Whether pupils and educators believe that academic ability is a stable and innate trait (a 'fixed mindset') or can be expanded through effort and practice (a 'growth mindset') has implications for pupils' learning, their resilience to setbacks, and ultimately their educational attainment. The way in which educators and parents give feedback to pupils can reinforce or weaken a given mindset
- **Cognitive biases.** We are susceptible to biases in our thinking such as: seeking out information to support pre-existing beliefs (confirmation bias), over-valuing information presented to us early on in an evaluation (anchoring with under-adjustment and the halo effect), and feeling the pain of a loss more acutely than the pleasure of a similar gain (loss aversion). These quirks can affect pupil's learning of subject content, influence the amount of effort exerted on academic performance, and shape teacher and pupil expectations and evaluation of pupil ability
- **Surroundings.** Subtle and not-so-subtle cues, such as exposure to words associated with intelligence or a view of nature from the window, can affect pupils' effort levels, ability to effectively manage major issues, aggression levels, and test scores

In some areas, the behavioural insight is used to change the attitude or effort exerted by the pupils; in other areas, the educators may stand to gain from an improved understanding of how our minds work, resulting in potentially fairer evaluation of all pupils, especially stigmatised groups such as low-SES pupils.

The next three sections explore each area in depth, backed with examples and evidence from academic literature. After each area is described, educator perspectives from our workshops and survey are reviewed, and practical recommendations grounded in these educator perspectives are provided.

4. Mindsets

Research over the past two decades has explored how a person's 'mindset' can influence their performance and resilience in many areas of life. This is highly relevant for pupils and their academic careers, and can have a profound effect on under-performing student achievement.

In this section we discuss:

- Pupil and teacher mindsets: fixed or expandable
- Changing mindsets
- The role of feedback and praise on mindsets and performance
- Mindsets and the SES gap
- Teachers' perspectives
- Practical recommendations

Pupil and teacher mindsets: fixed or expandable

Broadly speaking, people sit somewhere along a continuum between having one of two types of mindset, or set of internal assumptions about the nature of their performance and intelligence. Professor Carol Dweck and her colleagues refer to these different views as the *fixed* and *growth* mindsets. A fixed mindset is one that views intelligence level or ability as relatively fixed, ie, a person cannot do much to change their level of intelligence. In other words, if you are a 'smart' person, you will probably always be a relatively smart person compared to the people around you. In contrast, a growth mindset is one that views intelligence or ability level to be expandable: intelligence can be strengthened with practice and so one always has the opportunity to change how intelligent or able he or she is.

Crucially for our current purposes, students' self-perceptions of whether intelligence is fixed or expandable can have a major impact on their achievement and attainment. Pupils who think that their intelligence or ability level is relatively *fixed* may feel very proud when they can answer questions correctly or solve a puzzle correctly. But when they answer incorrectly, or run up against a difficult challenge that they cannot easily solve, they can lose motivation to learn or to attempt similar tasks in future. In their eyes, answering the question incorrectly, or not catching the ball, or not solving the puzzle, means that they have failed. For pupils in a fixed mindset, expending effort seems like a signal that they are not innately intelligent enough. Additionally, pupils may use lack of hard work or effort to shield themselves; if they try hard and fail, they have no excuses and cannot save the reputation of their intelligence by attributing it to lack of effort (Dweck 2006).

In contrast, students with a *growth* mindset think that their intelligence or ability level can be improved through practice, believing it to be malleable and expandable. When they answer a question correctly

For pupils in a fixed mindset, expending effort seems like a signal that they are not innately intelligent enough

they don't attribute it to any endowed or fixed intelligence level; instead, they attribute it to effort and practice, and understand that to get better at something one must continue to try to do it. Growth mindset students view getting a question wrong as an opportunity to learn and to get better. They feel they are continuously learning so this particular wrong answer simply indicates it is something they haven't yet mastered, but that through practice they will improve their understanding and answer the question correctly in the future. Pupils with a growth mindset see effort and persistence as necessary ingredients in the recipe for success.

Pupils with a growth mindset see effort and persistence as necessary ingredients in the recipe for success

This valuing of effort, persistence, and long-term stamina is crucial for learning and improved performance. Angela Duckworth and colleagues have found that 'grit', or "perseverance and passion for long-term goals"(Duckworth et al. 2007), can be a better predictor of success[9] than many other traditional measures such as IQ, standardised test scores, income, or even how safe the student feels at school (Duckworth et al. 2007; Duckworth & Eskreis-Winkler 2013; Duckworth 2013). For example, in her seminal work, it was found that grit, as measured by a self-reported questionnaire, was a better predictor of cadets completing their summer training at West Point (USA Military Academy) than was the Whole Candidate Score, which is a measure of SAT scores, high school class rank, a leadership score based on extracurricular activities, and physical aptitude (Duckworth et al. 2007).

Together, Dweck, Duckworth and their colleagues "conceive of mindsets as a basis of grit or tenacity" (Dweck 2013a). And in a recent TED talk, Duckworth explained that while she doesn't yet know how exactly to foster 'grittiness' in people, the most promising strand of enquiry is that cultivating a growth mindset also helps to strengthen grit (Duckworth 2013). In unpublished work,[10] Duckworth has found a moderate correlation between the extent of a growth mindset and grit in pupils (Duckworth & Eskreis-Winkler 2013). Given that in a growth mindset the strengthening of ability is achieved through practice and effort, it seems likely that understanding and developing a growth mindset are the precursors for exerting effort and demonstrating grit.

Although we have been discussing mindset from the perspective of the student, teachers' mindset plays a crucial role as well. "Teachers with the fixed mindset create an atmosphere of judging" (Dweck 2006 p 197), and may believe that it is not worth their time or energy to help students who, in their view, are innately less able than other pupils (Dweck 2006). To date, Dweck and her colleagues' work has focused primarily on pupils. By her own admission, "we have so far just shown that delivering growth mindset to kids … tweaking their [frames of] minds without changing anything about their environment can be effective… our working assumption is that if kids are in growth mindset…, any changes are supported and maintained, but we have not intervened at schools [the school level, eg helping teachers to develop a growth mindset]." (Dweck, 2013a). We believe a promising area of work would be to train the educators themselves so that they embody the values of a growth mindset. This may help

9. Success as an objective achievement, eg graduation, employment status, etc. (Duckworth et al. 2007).
10. As of April 2013.

to prevent the situation observed in our workshop, where some teachers 'talked the growth talk but walked the fixed walk'. By understanding the importance of mindset, teachers are able to not only model 'growth' attitudes for their pupils, but also to consider more carefully the type of praise they give to their pupils.

Changing mindsets

Mindsets can be shaped indirectly through modelling behaviour consistent with one mindset or the other. Dweck and her colleagues have found that mindsets can also be shaped directly, by teaching students about the plasticity of the brain and the neurological changes that occur during learning and practice. For example, she suggests using the following language to help pupils: "new research shows that the brain is more like a muscle – it changes and gets stronger when you use it…when you learn new things, these tiny connections in the brain actually multiply and get stronger. The more you challenge your mind to learn, the more your brain cells grow" (Dweck 2006 p.219). Interestingly, referring to new neuroscientific research can also be a useful way to help teachers learn about a growth mindset without having them feel that it is an attack on their previous teaching style. In our interview with Dr Dweck, she explained:

> "[I]nstead of saying to a teacher, 'You've been harming kids for 20 years and now it's time to stop,' you're saying, 'Look we all used to think the brain was a fixed thing, some kids got good ones and some kids got bad ones… Everybody used to think that, but now we know the brain has so much plasticity and that we can predict who's going to blossom with enough attention and effort. So we now have to really try and take advantage of that plasticity…'"[11]
> **Dweck 2013a**

In addition to modelling 'growth' behaviour and teaching pupils (and educators) about how the brain learns, mindsets can be fostered by appropriate praise, discussed at length below.

The role of teacher (and parent) praise on mindsets and learning

Praise that teachers give to their pupils, and parents give to their children, can be hugely influential in shaping a pupil's mindsets

Praise that teachers give to their pupils, and parents give to their children, can be hugely influential in shaping a pupil's mindset. However, it is *not* the case that all praise has the same effect: the *type* of praise is incredibly important, as praising the person, praising the process, or giving objective feedback all have different effects on pupil's mindset, persistence with and enjoyment of the task, and overall performance.

There are many different ways to give someone verbal feedback, and each may send a subtly different message to the recipient. Consider the three statements 'wonderful – you're so clever' versus 'wonderful – you worked so hard on trying to understand this' versus 'wonderful – you got 8 out of 10 correct'. The first statement, "wonderful – you're so clever", is praising the student for ability or intelligence, and tacitly conveys the

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11. For a more detailed discussion of the profound implications of brain plasticity, see Doidge, N, (2007) *The Brain that changes itself*. London: Penguin.

belief that a stable trait of the person is what is being prized. This *person praise* (sometimes referred to as generic praise, see eg Zentall & Morris 2010, intelligence praise or ability praise) reinforces a fixed mindset (Mueller & Dweck 1998; Dweck 2006, Zentall & Morris 2010). The second statement, 'wonderful – you worked so hard on trying to understand this', praises the pupil for the process specifically, rather than a trait of the person or even the outcome of the interaction (such as a correct answer). *Process praise* like this (sometimes referred to as non-generic praise or effort praise) helps to foster a growth mindset, and as discussed below, has been found to improve various components of a successful learning journey (Bayat 2011; Mueller & Dweck 1998; Dweck 2006; Zentall & Morris 2010). Finally, the third statement, 'wonderful – you got 8 out of 10 correct', is objective outcome feedback that lacks as strong an implicit value judgement as do the other types of statements, but clearly praise that only describes the outcome is not emotionally satisfying for the person giving or receiving it in the long term.

Many studies over the past several decades have investigated these relationships described above; perhaps the most notable is an analysis of six studies by Mueller and Dweck (1998). The schoolchildren involved in the studies were asked to complete a set of pattern-completion matrices, were given feedback (either process feedback, person feedback, or objective outcome feedback), given a set of harder matrices, and asked a series of questions to help the researchers understand the effects of the different types of feedback.

The results of the studies are striking and demonstrate the effect of praise on mindset and associated task-related measures. To start, students praised for effort enjoyed the activity more so than either those who received objective outcome feedback or those praised for ability. When given the choice, those praised for ability chose to continue in line with a performance goal (eg more 'problems that are pretty easy, so I do well') over a learning goal (eg more 'problems that I'll learn a lot from, even if I won't look so smart'). And after encountering a setback (in the form of the very difficult second set of problems), the ability-praise group were less likely to want to persist with the task by bringing the problems home with them. Finally, those pupils praised for ability attributed their performance less to low effort and more to low ability than the group praised for effort; this is important because it demonstrates that ability- (or person-) praise is associated with the internalisation of the message that performance is an indication of a stable trait.

The different types of praise affected not only mindset and attitudes, but also measured performance. The last stage of the study was to give the pupils another set of matrices, this time at the same level of difficulty as the first set. Pupils in the praised-for-effort group did significantly better on this third set of matrices (after being challenged by the difficult second set) than on their first set, and those praised for intelligence did *worse* on their third set, clearly demonstrating how praise, likely mediated by mindset, affects resilience to setbacks and overall attainment.

A subsequent study investigated further and found that pupils praised for their effort chose to gain access to information that would provide them with new problem solving strategies to improve their performance, whereas those praised for intelligence or ability chose to find out the

scores of others to validate their own sense of worth. And finally, nearly three times as many students praised for ability misrepresented (lied about) their score when asked to send it to an anonymous student at a different school, even though they would never see this student, as those in the effort-praise group or the control group.

It should be noted that ability – or person – praise is not *always* detrimental. When given a situation where the student is experiencing only successes, this type of praise can increase intrinsic motivation (albeit motivation to continue doing well *in order to demonstrate and validate their worth as measured through performance, not for the sake of learning itself*). (Muller & Dweck 1998; Dweck 2006.)[12]

<div style="float: left; color: orange; font-style: italic;">
The different types of praise affected not only mindset and attitudes, but also measured performance
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Mindsets and the SES gap

In a sense, a pupil's mindset has more of an impact on performance the lower the baseline performance level (although not necessarily on well-being, where it may be equally beneficial at both high and low performance levels), both because there is more room to grow and because it may help to break through existing stereotypes or negative teacher perceptions, which as discussed in section 2 are more prevalent in relation to children from more deprived socioeconomic backgrounds

In our interview with Professor Dweck, we discussed the effect of mindset on the SES attainment gap. She explained:

> "We often find the biggest effects for students labouring under a negative stereotype, be they the poor students or the girls and math or minority students. So [developing a growth mindset] often closes, narrows the gap… because if that negative stereotype says it's fixed and your group doesn't have it, but if you think it's a learnt set of skills, that just doesn't sting in the same way. If it's a learned set of skills I can learn it."
> **Dweck, 2013a**

Dweck's statement supports our claim that changing mindsets can be beneficial in narrowing various attainment gaps, including the socioeconomic status gap. While we do not have empirical evidence to further support this suggestion, the points above give us reason to believe that the benefits of helping a pupil to develop a growth mindset, at least in terms of attainment, are concentrated on the lower performers, in essence raising the floor of the attainment level.

An overview of the key differences between a fixed and growth mindset can be found in table 1. Given the benefits of a growth mindset, especially for poor performers or stigmatised groups, it seems promising to support

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12. Inconsistent praise, combining both person- and process- praise, yields more complex effects. Zentall & Morris (2010) found that process praise raised both self-evaluation and task persistence in kindergarteners. But in inconsistent praise scenarios, even a little person (ability) praise made them less likely to want to persist with the task, and even a small amount of process praise maintained the control level of self-evaluation.

While the type of praise is important, so too is the sincerity of it. Giving false praise may undermine the authenticity of true praise. According to Bayat (2011), "a child who is praised senselessly for tasks in which he puts little effort might doubt the sincerity of the person praising him, or worse, might doubt his own sense of worth" (p.125). A potentially better strategy is to acknowledge the deficits so that effort and hard work can be targeted to those areas.

initiatives that help both pupils and educators to cultivate a growth mindset and its associated benefits for teaching and learning. Beyond the cost of raising awareness amongst teachers about the effects of praise, using effort-praise to commend the process of learning is a relatively low cost and low touch change that shows signs of profound impact on pupil enjoyment, resilience, and performance in the classroom.

Table 1: Dr Carol Dweck's fixed and growth mindsets

	Fixed	Growth
View of intelligence and ability	Innate, relatively unchangeable. Cannot be changed much. An 'entity' theory of intelligence.	Malleable, expandable. Can be strengthened through effort and practice. An 'incremental' theory of intelligence.
View of poor performance	Personal failure; "this shows that I'm not good enough".	Challenge to improve; opportunity to understand where efforts should be focused.
View of effort	Effort should not be needed by people with innate ability or intelligence.	Effort and persistence are critical to continuous leaning.
Motivation goal	Performance goals: the aim is to maintain an image of ability.	Learning goals: the aim is to learn and continuously be challenged.
Resilience	Not eager to try again; likes to answer questions with which they are already confident; doesn't want to feel exposed.	Willing to try again and attempt even harder challenges.
Praise to reinforce the mindset	Praises the person, their ability or intelligence; "Wonderful, you're so clever".	Praises the process or effort; "Wonderful, you worked so hard on trying to understand this".

Teachers' perspectives

Workshop insights
Our workshops in Berlin served both to inform us about the teachers' explicit and implicit views on mindset and as a platform for the teachers to discuss the relevance of the concept to their work.

All but one of the teachers in our Berlin workshops were not previously familiar with the research about fixed and growth mindsets; however, the categorisation seemed to resonate with them immediately as we began discussing the concept.

Interestingly, before we shared the mindset research with the group, we asked the teachers their views on intelligence. At this early stage, the consensus was that intelligence is malleable and can be developed. Here, the teachers noted that both teachers and parents have an influence on the pupil's development of intelligence. The participants seemed surprised to even be discussing the idea of innate and rigid intelligence, with one even remarking that "a teacher who assumes that intelligence is fixed is in the wrong profession" but conceding that "but, there are such teachers".

After reviewing some of the findings about fixed and growth mindsets, the teachers seemed to recognise their own mindset or the effects of mindset on their pupils. Whether due to the comfort of being shown that many people do indeed have a fixed mindset – and that it can be changed

– or due to simply letting their guard down as the participants became more familiar with one another, throughout the rest of the workshop teachers expressed more fixed mindset attitudes. For example, the use of phrases such as "weaker students" and "intelligent students" crept into discussion, and some explicitly admitted that they could see in themselves a fixed mindset. One teacher felt that mindset is "incredibly strongly embedded in the culture" of a classroom. We asked Professor Dweck about this finding that some teachers seemed to talk the growth talk but walk the fixed walk. She explained that a fixed mindset may be more comfortable for some teachers – because then they are released from the burden of responsibility to help their low-performing students improve. "There's something comforting for some teachers to say, "Oh those kids have poor backgrounds, or they don't want to work hard, it's not my fault that they're not learning. It's not my job. I'll focus on the kids who are prepared to learn"" (Dweck 2013a). A growth mindset can be empowering but also a lot of responsibility.

The group of teachers had not previously considered very deeply the use of feedback and its effect on students, whether in response to a correct or an incorrect answer. One teacher explained his/her use of 'praise cards' which students can give to their peers, and which can be traded in, for example if a student is on the cusp of a grade. However, there was little discussion about whether praise was given for knowledge or for effort, with most praise discussed being unqualified or general. Perhaps this indicates only a limited set of tools from which the teachers usually draw.

Overall, the teachers in this workshop felt that student and teacher mindset could have significant consequences on their classrooms and felt it is an area which should be discussed more in their schools.

Interview and survey results

When Vodafone Stiftung Deutschland asked teachers in Germany about talent versus hard work,[13] over half responded that with effort and targeted support, less talented students can also be successful. However a full 27% feel that a lack of talent cannot be compensated for, reflecting a very fixed mindset point of view (VSD 2013).

In our survey to a representative sample of English teachers, we attempted to elicit whether they tend to have a fixed or growth mindset by asking them to what extent they agree or disagree with four 'mindset' statements (Dweck 2006). Our results show that English teachers tend to exhibit a somewhat more fixed mindset over a growth mindset, but to a small degree.

Exploring what type of praise teachers give when pupils answer a question correctly, we found that nearly three quarters of teachers like to include specific details about the quality of the answer in their praise. An example of this type of praise would be "well done; you used some counter-arguments to balance your statement". Roughly 45% said that they would most likely praise the pupil for their effort or persistence, such as "well done; you've been working hard practising this"; as discussed earlier, this type of praise helps to foster a growth mindset among pupils. Praise

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13. "Do you think that every student can be a good student, independent of talent, if he puts in enough effort and gets targeted support, or do you think that a lack of talent usually cannot be compensated with effort and support?"

for being bright, such as "wonderful; you picked that up so quickly, you're really clever", would be given by roughly 14% of the teachers surveyed. Although 14% is certainly a minority, it still presents an opportunity for improvement – if teachers reduced the instances in which they praise for intelligence and instead praise for persistence, growth mindsets might become more prevalent within English schools.

Practical recommendations, grounded in discussion with educators and experts

- **Praise pupils for effort instead of ability or intelligence; praise for the process of the learning instead of the outcome.** This type of praise will help strengthen pupils' resilience when they come up against a learning challenge and will help to instil or reinforce the idea that intelligence is not a fixed trait.
- **Teacher becomes the lead learner.** Educators can shape mindset through modelling it for the pupils. A suggestion by one of the German workshop participants is that "it helps to talk about one's own weaknesses, to openly say 'even at the age of 40, I am still learning every day'". We suggest taking this a step further and not refer to this as a weakness, but rather frame the teacher's interest in learning as their most compelling instructional quality.
- **Give a 'not yet' grade instead of a 'fail'** to promote a growth mindset, as suggested by Dr Carol Dweck in a recent event at the RSA (Dweck 2013b). This sets the expectation that with the right support and mindset, a struggling pupil is not destined to perpetual failure.
- **Position wrong answers as an opportunity to learn more**, to think about the process, and as natural to the learning journey. In the same way, the value of a not-perfect grade can be shared with pupils, a suggestion that emerged from one of the workshops. Dweck offers the following prompt to help embed growth values in the classroom: "Who had a fabulous struggle today?". Music conductor, teacher, and public speaker Benjamin Zander suggests replying to a mistake with "how fascinating!" (Zander 2012).
- **Build mindset into assessments of pupils.** Dweck (2013b) suggests giving pupils credit for exhibiting characteristics of a growth mindset. All pupils (both lower and higher performing) will be measured, with the mindset assessment contributing to a pupil's overall mark.
- **Build mindset into assessments of educators.** Similarly, educators should be assessed on their own exhibiting of a growth mindset and how well they model it and foster it in their pupils.

5. Cognitive biases

There are many ways in which we are not always as in control of our thinking as we believe ourselves to be. Rather than always calling upon a careful, deliberate, thoughtful process of evaluating all relevant information in an unbiased way, instead, we call on automatic responses, emotions, heuristics, or fall back on ingrained tendencies to make judgments and decisions. This range of thinking tendencies – which lead us to different outcomes in judgements and decisions than what we might expect – is called *cognitive bias*.

Here the word 'bias' refers to a *systematic* deviation from a purely balanced judgment. As will be discussed, we systematically over-value an initial piece of information over subsequent information, we systematically interpret information in such a way as to support our pre-existing beliefs, and we systematically are more motivated to avoid a loss than to acquire a gain of an equal amount. Susceptibility to these cognitive biases is not an indication of low intelligence or lack of education; rather these are fairly universal thinking tendencies, pervasive in many areas of life with implications beyond educational policy and practice.

In this section, we explore how these cognitive biases influence educators' evaluations of pupils and pupils' learning of subject content, their perceptions of their own capabilities, and ultimately their academic performance, and cover the following:

- Anchoring and halo effect
- Confirmation bias
- Loss aversion
- Susceptibility to cognitive biases
- Teachers' perspectives
- Practical recommendations

5a. Anchor (and under-adjust) and the halo effect

Nobel Prize winning psychologist Daniel Kahneman realised that his grading of student essay exam questions was influenced by a subtle bias. He noticed that if the first essay in the exam was good, the rest of the marks on that exam were rather similar; he was *anchoring* the marks he gave for later questions on the mark he gave on the first question (Kahneman 2011).

Anchoring is the tendency to rely too heavily, or to 'anchor', on a past reference or piece of information when making estimations or evaluations, and fail to adjust our estimations away from that anchor sufficiently. Amazingly, the anchor can be completely irrelevant. For example, because we read left to right, sometimes even the leftmost number can act as an anchor. Those asked to estimate the value of this

number: 7×6×5×4×3×2×1 will estimate a significantly higher value than those who are asked to estimate this one: 1×2×3×4×5×6×7, even though when viewed together it is clear to see that the two values are identical (Kahneman 2011).

In an experiment by Daniel Cervone and Philip Peake (1986), anchoring was shown to influence both self-efficacy and subsequent persistence on a task. Students were asked to pick a seemingly random number out of a bag (which was actually manipulated to be either high (18) or low (4)) and then asked to give predictions about how many anagrams they could solve. The first prediction was whether they thought they could solve more than or less than the value that had just been drawn (4 or 18), and the second was exactly how many items they would be able to solve. The students unknowingly *anchored* their prediction on the random number picked out of a bag, so that on average, those who picked 4 estimated that they would solve fewer items than those who picked 18, demonstrating that the arbitrary anchor did indeed influence the students' self-efficacy.

The implications of an anchor influencing beliefs about competency extend further. The students were then given the set of problems to complete, which increased in difficulty level to the extent that some of the last items were unsolvable (but not obviously so). The results suggest that the level of self-efficacy, which was itself influenced by the arbitrary number-out-of-a-bag anchor, had an effect on the level of persistence the student showed. Those in the high anchor group, who had picked the high number and subsequently judged themselves to be able to solve more items, attempted significantly more trials than the control group or the low anchor group. Thus the original anchor played a role in the participants' subsequent task persistence by influencing their judgements about their own ability.

These findings are important because they suggest that pupils who have low belief in their own capacity to do well at school may be lifted out of this, not only through overt attempts to promote a growth mindset as discussed in section 4, but also by subtle – and arbitrary – means. Whether teachers could use an anchor in their classrooms before an exam or assignment, by asking all pupils whether they thought they could score above or below 90%, for example, would be an interesting field experiment. Because a pupil's self-efficacy, or belief in their own capability, is instrumental in effective learning, this anchoring effect could have meaningful impact on a low-performing pupil's educational attainment.

Anchoring is not confined to abstract number experiments – it can also affect our evaluation of the people around us in everyday situations. This gives meaning to the adage that first impressions last. When referring to other people, this particular version of anchoring is often referred to as *the halo effect*. We tend to naturally focus on the first attributes we encounter in another person and under-weigh or even largely ignore the others. It is plausible and potentially very noteworthy that teachers' evaluations of pupils in the first days or weeks of the academic year will have undue weight on their continuing evaluation throughout the year. Moreover, in so far as this tendency applies, it may directly impact not only on how a pupil is assessed, but on how well they behave and perform as a result of how they see themselves in the teacher's eyes.

Anchoring is not confined to abstract number experiments – it can also affect our evaluation of the people around us in everyday situations

Mitigating anchoring and the halo effect

Returning to Kahneman's dilemma, to counteract this biased marking of exams, he developed a new system for himself where he would mark Question 1 on each student's exam first, and put the grade on the inside of the back cover of the exam booklet, out of view. He then returned to the stack of exams and would grade each student's Question 2, and so on. Kahneman found that, for a given student, the marks on the exam were now much more varied. He admits that this increased variation led to reduced confidence in his grading. That there was less coherence made him uncomfortable, but this was outweighed by the recognition that this was overall the better method, because it is less influenced by the halo effect (Kahneman 2011).

Overall, anchoring and the halo effect may have consequences for learning across a number of areas, including but not limited to a pupil's belief of his or her own capability and subsequent academic performance, and teacher perceptions and assessments of pupil performance.

5b. Confirmation bias

> "The human mind is a lot like the human egg, and the human egg has a shut-off device. When one sperm gets in, it shuts down so the next one can't get in."
> **Charlie Munger**

Confirmation bias is the tendency to look for and pay attention to information which confirms existing beliefs or preconceptions, or to interpret that information in such a way as to confirm or support existing beliefs. While Munger's quote above illustrates the effect of the confirmation bias, it is descriptive rather than prescriptive. That is, although it may be a human tendency to seek confirmatory evidence, we are not constrained to doing so, and can help ourselves to acquire a more balanced picture of the given situation. Confirmation bias may affect learning of subject content, but perhaps more importantly in the context of the SES attainment gap, it may influence both teacher and student perceptions of ability.

Box 2: Why are we so good at supporting our own pre-existing beliefs?

Confirmation bias may be explained by the following sequence, relating to cognitive frugality – the tendency to conserve mental energy wherever possible. When initially interpreting a statement, a person relies on their associative memory to initially understand the statement. According to Daniel Gilbert, a psychologist at Harvard University, this initial construction of an interpretation will evoke belief. It then requires more cognitive effort to counter this belief than it would to maintain it. In other words, it is simply *easier* and in most contexts it feels more rewarding, to continue believing something and confirm the belief's validity than it is to actively change a belief (Kahneman 2011).

Highly educated people are at least as susceptible to this bias as others.[14] In fact, the education system and certain professions (such as Law) may act to reinforce the confirmation bias. Although training students to build a case for and justify their positions with evidence is clearly desirable, this may in fact strengthen the confirmation bias. Therefore there is a need not only to clearly differentiate between deliberate case-making and evidence-gathering in the classroom, but also to balance training for case-building with an inculcation of other learning values such as "truth-seeking and scepticism" as advocated by Ron Ritchhart in his book Intellectual Character (2002). About this distinction, Raymond Nickerson (1998, p.205), a psychologist at Tufts University, says:

> "The extent to which the educational process makes explicit the distinction between case-building and evidence weighing deserves more attention. If the distinction is not made and what is actually case-building passes for the impartial use of evidence, this could go some way toward accounting for the pervasiveness and strength of the confirmation bias among educated adults."

If, as suggested, our education structures and social norms may be unintentionally reinforcing this tendency beyond the universal bias, then highly qualified and well-educated teachers may be at least as susceptible to this bias as others. Along with the cognitive bias, the likelihood that teachers are unintentionally seeking out information to confirm their existing beliefs about a pupil may be compounded by their own earlier educational experience.

The implications of the confirmation bias for pupils with respect to learning subject content are clear: it may be difficult for teachers to un-teach or re-teach material, and it may shed light on why it might seem that certain ideas or theories are firmly embedded in a pupil's mind. They are naturally seeking out information that is reinforcing that position.

But the confirmation bias also has potentially more profound implications at both the pupil and teacher level for feeding in to preconceptions about mindset, pupil ability, and other stereotypes regarding academic performance. Regarding mindsets (discussed in the previous section), if a student or educator believes that intelligence is innate and stable, they will interpret performance in such a way as to confirm that, thus even more deeply embedding the fixed mindset. Conversely, once a pupil is exposed to the growth mindset and starts to eventually embody the associated growth attitudes, the confirmation bias may help the student in reinforcing the understanding that intelligence and ability can be strengthened through practice.

Initial impressions about how well a pupil is learning or subtle stereotypes about 'what type' of pupil s/he might be could be carried on throughout the year in part because of the confirmation bias. This may be particularly harmful given what we know about children from low-SES

The confirmation bias also has potentially more profound implications at both the pupil and teacher level for feeding in to preconceptions about mindset, pupil ability, and other stereotypes regarding academic performance

14. Interestingly, Duckworth and Eskreis-Winkler (2013) suggest that a potential hypothesis for future examination is whether 'grittier' people (discussed in section 4) are more susceptible to the confirmation bias, although this research has not yet been carried out.

backgrounds being likely to start off their schooling at a lower performance level due to differences in family processes and social and cultural capital in their early years, as reviewed in section 2. These children may arrive already at a disadvantage, which is then perpetuated in part to tendencies such as the halo effect and confirmation bias. This perpetuation may offer a fresh perspective on more traditional reform around the accessibility of early-years educational programmes to mitigate the differences in performance early on, improving educational equality down the line (Freitag & Schlicht 2009).

Even in the cases where there is no actual initial difference in ability as demonstrated through performance, if pupils from a low-SES background are stigmatised or stereotyped as being less capable of performing well academically, both they and their teachers may unwittingly be reinforcing their own beliefs about educational attainment.

Crucially, low-SES pupils risk being unfairly characterised as being destined to a certain performance range from the beginning of the year or even the beginning of their schooling. Especially in a system where students are directed into one stream of education at a relatively young age, and that this stream effectively dictates the course of the remainder of the pupil's academic journey, it is important that educators understand this tendency and discuss its implications with colleagues and students.

Children may arrive already at a disadvantage, which is then perpetuated in part to tendencies such as the halo effect and confirmation bias

5c. Loss aversion

The term loss aversion describes the tendency for people to be very motivated to avoid a loss – more so than to achieve a gain of an equal amount. Framing incentives so that pupils must work to avoid losing them (rather than to gain them) may be a way of improving effort levels. These incentives could take the form of money, something symbolic such as a trophy or gold stars, or, as we propose later, could even be the grades assigned to a pupil.

Box 3: Loss aversion – a thought example

Most people would try harder to avoid losing £100 than they would to gain £100. An illustration of this can be found in the following thought example: consider the offer to participate in a coin toss where heads results in winning £100 and tails results in losing £100. Would you accept the gamble? Many people would not. Interestingly, even if the gamble were to be changed so that the cost of losing stayed at £100 but the prize for winning increased to £150, many people would still refuse the gamble (Kahneman 2011). Of course this also reflects our tendency to avoid risk where possible, but shows clearly how the fear of potentially losing the money is greater than the excitement of potentially winning it.

A paper published by the National Bureau of Economic Research analysed the results of several studies conducted among students of different ages to look at the role of loss aversion and incentives on effort exertion in school (Levitt et al. 2012). The researchers offered students an incentive (sometimes this was monetary – either $10 or $20; other times it was symbolic – a trophy) if they performed better on an imminent test than they had done, on average, on their previous three tests. The researchers varied whether the reward was framed as a gain or a loss by either promising it to the students after the test (gain), or by giving the students the reward prior

to the test, and explaining that it would have to be returned afterwards (loss) if they did not meet the criterion. The study found that indeed offering incentives framed as a loss was more effective at improving test scores.[15]

Notably, the researchers told the students about the rewards only immediately prior to the test. This was because they were trying to isolate the effect of the incentive on effort only, and wanted to avoid encountering a confounding effect of 'human capital accumulation' (studying more). In other words, it was not that students were so motivated by the potential reward that they studied better; instead, they exerted more effort during the test to achieve a higher score. The results suggest, then, that at least some students have a high cost of effort which is not compensated for by intrinsic motivation alone. For these students, some sort of extrinsic reward, especially when framed so that they must work to *keep* their reward rather than to gain it, may help to improve effort levels.

Although the use of loss aversion in educational practice seems promising, there have been areas where loss framing has not been found more effective than standard gain framing. Dolan et al. (2012) ran an experiment to explore the effect of bursaries on university students' inclination to go into the teaching profession. Here, they found that the framing of low-value incentives (up to £10) had no significant effect on university students' effort level on an online task (typical for such experiments). In line with the view that loss aversion has been shown to be influential on effort levels in many other research experiments, the authors suggest that "more research is needed to test whether this finding is unique to the parameters used in this study". Therefore using a loss frame is not a silver bullet and, while the use of loss aversion may help improve effort, it should not be expected to provide significant changes to student motivation in all cases all of the time. Rather, it should be considered an interesting concept which could be explored and tested out by teachers in the classroom. We provide guidelines for how to do so in section 5e.

5d. Susceptibility to cognitive bias

Susceptibility to these cognitive biases in judgment, summarised in table 2, is not limited to a select few. Rather, these biases reflect human tendencies in the way we think, theorised to be evolutionarily adaptive strategies which may have been more suitable in our ancient past.

It was noted earlier that highly educated people are on average at least as susceptible to some quirks, such as the confirmation bias, as less educated people. Additionally, susceptibility to these biases is not strongly correlated with standard measures of intelligence (Furnham & Boo 2011)[16] and a higher IQ only helps people to avoid cognitive bias if the people are specifically instructed to minimize their bias; if they are left to determine on their own that a bias might exist, people with a higher intelligence do no better at avoiding bias than those with a lower

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15. It should be noted here that this study looked at one-time-only behaviour change. A current strand of enquiry among academics is whether loss framing works as well in sustaining repeated behaviour as it does in changing once-off behaviour.

16. A literature review of the anchoring effect does list two studies showing that the anchoring effect is mitigated by higher cognitive ability or by existing level of knowledge, but many more provide evidence supporting the claim that there is no significant correlation between anchoring effect and cognitive ability or knowledge/experience/expertise.

IQ (Sotala 2010). Even top experts in the fields of psychology, behavioural economics, and cognitive science, such as Kahneman himself, are susceptible to unintentional bias.[17] And in fact, those with higher 'cognitive sophistication' were found to be more susceptible to the *bias blind spot*, the name given to the phenomenon of failing to recognize our own biases while recognizing them in others (West, Meserve & Stanovich 2012).

Table 2: Cognitive biases and their relevance to performance in the classroom

Cognitive bias	Description	Relevance to improving performance in the classroom
Anchoring	The tendency to overvalue an initial piece of (potentially irrelevant) information in an evaluation, and insufficiently adjust their evaluation away from that anchor.	Anchoring can influence belief about performance, which can subsequently affect actual performance.
Halo effect	Focussing on the first attributes we encounter in another person and under-weighing or even largely ignoring the others. 'First impressions last'.	Teachers' impressions of pupils in the first days or weeks of the academic year may have undue weight on their continuing evaluation of them throughout the year, and pupils may behave and perform in response to how they see themselves in the teacher's eyes.
Confirmation bias	The tendency to look for and pay attention to information which confirms existing beliefs or preconceptions.	Implications are at both the pupil and teacher level for feeding in to preconceptions about mindset, pupil ability, and other stereotypes regarding academic performance.
Loss aversion	People are generally more motivated to avoid a loss than to achieve a gain of an equal amount.	Incentives framed as a loss (eg that are given upfront but taken away if the pupil does not meet a certain criterion) may be more motivating than those framed as a gain.

Although it is difficult and may take effort to mitigate these biases, knowledge about them and enhancing the discussion of them among colleagues and peers can help in at least two ways. Making these biases part of our everyday conversations will allow us to both acknowledge without embarrassment where we have exhibited them, and help flag up potential minefields to others. Discourse about the universality of these biases may help to prevent a colleague from feeling personally attacked when it is pointed out that he or she has just exhibited a cognitive bias. Additionally, with insight into our vulnerability to these thinking biases, we are better able to design practice to either mitigate or make best use of these thinking tendencies.

The concepts introduced above provide a basis for discussion that pupils and teachers alike may be influenced by these thinking patterns and biases in judgments. For students, this may affect their learning of subject content, the effort they exert, or their own self-perception. For teachers, this may affect the way that they evaluate pupils and assess their work, with implications for the recommendations they make about the pupils' future education, such as to which stream of secondary school the pupil

17. Behavioural Economist and popular author Dan Ariely states that his intuitive responses are probably not much improved by his knowledge of cognitive biases, but his slower system 2 decisions and evaluations might be improved. See, for example: Ariely. D. (2012). Getting Junior to move. Wall Street Journal.

should attend. Better awareness of various cognitive biases may prove helpful in improving performance and ensuring fair evaluation of all pupils, regardless of their social background.

5e. Teachers' perspectives from workshops in Berlin and the English survey

The workshop with teachers was used to both increase awareness of some of the cognitive biases we exhibit as humans and to gauge how relevant the participants feel the biases are in the classroom on a day to day basis.

Anchoring / halo effect

Teachers understand that when putting pupils forward into a Realschule, Hauptschule, Gymnasium, or Gesamtschule, they are influenced by their own gut feelings. According to one teacher "not every case is decided rationally; intuition also plays a role".

Most teachers in the workshop felt that the halo effect is inescapable. "I have a particular image in my mind of every student; I cannot make myself free from that" and "we all have students whom we like more than others" were two striking comments which illustrate the difficulty in avoiding biased evaluation and impressions of students. Others mentioned that a pupil's surname and/or the performance of their older siblings can affect a first impression about a pupil, although one participant stressed that he didn't believe this to be related to social class.

The order in which exams and individual exam questions are marked is not irrelevant. There may be practical reasons for marking exams in a certain order: one teacher admitted that s/he sometimes sorts the completed tests in order from good student to bad student, because those of the good students are easier to mark, and another mentioned that if exams are collected in the order of when a pupil finishes, those at the top of the pile will be the students who spent (or needed) the longest amount of time, and so may create an anchor against which the other tests are evaluated. One teacher mentioned that to avoid anchoring s/he could take the quizzes from one excellent, mediocre, and worse pupil and mark those papers first; however, this statement shows that the teacher did not seem to appreciate the within-exam effect of anchoring, and also demonstrates an existing pre-conception of how individual students will fare on the exams.

Some suggested that speaking about the pupils with other teachers, so as to get other views on the pupil, would be beneficial; however, there seems to be drawbacks to this. The teachers described that in practice, only the outliers get discussed – the students who are particularly thriving or struggling. The middle tier of pupils is often relatively less discussed among the teachers. Additionally, a danger of this suggestion is that together the teachers would succumb to group-think, where they all tether their impression to one singular point of view put forward by a particularly vocal or persuasive individual.

Finally, one teacher described that at his/her school they have decided to refrain from briefing new teachers about the students in a direct effort to minimise the propagation of student reputations as regards their ability. This, however, presents an interesting challenge for new teachers who could greatly benefit from certain types of information about a particular

student. We suggest that teachers should not be afraid of discussing and sharing information about students which could be valuable for the teacher, such as "she has a hectic home life, so on Monday mornings she may take some time to settle". Rather than completely refraining from sharing such information, it would be ideal for teachers to know enough about cognitive biases and growth mindsets so that they can discuss pupils openly with each other, but all the while pushing themselves to challenge their own (and others') assumptions about the pupil.

Confirmation bias

The participants were unanimous in agreeing that we are all subject to an extent to the confirmation bias. One participant linked the confirmation bias back to the discussion about mindsets and resilience to failure when he stated that the confirmation bias may contribute to the difficulty in recognising that a well-performing student might have low resilience to failure:

> "Let's once again come back to the girl from the beginning [discussed in an earlier scenario]. I think this is something for which you need a higher level of sensitivity, because, at first glance, she obviously is the best pupil in class. But to recognize that it is hard for her to face challenges, and that she is easily demotivated, is something you are more likely to miss when you're biased that way."

A proposal, listed below in the practical recommendations section, which emerged from the conversation, was to engage students in perspective-taking or role-playing exercises to counter the effects of the confirmation bias and help pupils expose themselves to information that counters their initial position.

Loss aversion

We put forward a particularly provocative proposal to tap into the motivating power of loss aversion using the grading system. We asked participants how they felt about each student starting the year with an 'A' (or a '1' in the German context) and the teacher docking points when necessary. Would this work? What are the practical challenges to this?

The teachers pondered and discussed this option at length. Proponents of the idea thought that this could invoke in the students a desire to "defend" what they already have (a top grade), and shows confidence in the pupils' strengths. Others thought that rather than grades, excursions and exchange programs are a better incentive to improve performance.

A challenge with the 'everybody starts with an A' approach raised by one participant was that it doesn't leave any room for the pupil to grow; however, this view seems to miss the point that there must be continuous growth to keep the high grade, so rather than stifling growth, such an approach might improve the drive and motivation to continually grow. In a similar vein, this type of approach could also support a growth mindset, discussed in the previous section. Recall that the growth mindset is one which does not view ability as fixed. Having all pupils start with an A simply reframes the starting point as one where everyone has the potential for an A grade, but it will require hard work and persistence by the pupil to maintain this grade.

Giving students the incentive of the A upfront might change their effort or drive to perform well

Benjamin Zander, a world-renowned music conductor, uses a similar technique with his music students. He gives each student an A at the beginning of the year on the condition that they write him a letter post-dated to the end of the academic term, starting with "Dear Mr Zander, I deserve this A because…" and then describing the person they will have become by the end of the term. He found that giving an A grade upfront reduces the anxiety of self-doubt and constant comparison to other classmates which might hold people back from performing at their best, and can shift a teacher's perspective as well (Zander & Zander 2000; Zander 2012).

In contrast to Zander's method of giving "permanent, unqualified A's" (Zander & Zander 2000 p39), our approach does *not* mean that all students end up with an A. Rather, it is a simple reframing of the starting point, which we believe has the possibility to improve performance through many ways. As demonstrated in the study (Levitt et al. 2012) described in section 5c, giving students the incentive of the A upfront might change their effort or drive to perform well. Not everyone will be able to maintain their A, but since they have had the taste for the good grade at one point they will be hungry to regain it. In other words, the improved motivation applies to both not wanting to lose the A, but also to working back up to it when required. Additionally, starting with an A may help to shift the teacher's, parents' and carers', and pupils' expectations about the pupil's potential, which may have a positive knock-on effect on learning.

Starting with an A may help to shift the teacher's, parents' and carers', and pupils' expectations about the pupil's potential

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Box 4: Putting it into practice: everyone starts with an A

Given that each classroom and school will have different existing norms, policies and constraints, it would be unwise to recommend a single technique to trial the 'everyone starts with an A' approach. While we do not offer a blanket solution, we can provide an example from which to draw some inspiration.

On the first Monday in January, thirty twelve year old pupils arrive in their classroom for their first geography class of the term. On their desks are new blank notebooks. The teacher announces that this term's module will be 'rivers and streams' and asks them to open their books. On the first page of each notebook, the teacher has written the following grade: 'A'. The teacher explains that everyone is starting with an A and that each person has the potential to maintain this A, clearly setting out the criteria to do so. When the pupils arrive home later in the day, they proudly show their parents the notebook and the accompanying note from the teacher which explains the approach, what the pupils need to do to maintain this grade, and how parents or carers can support the pupils. This strategy could be used over a longer or shorter time period, with one or several subjects or projects.

Questions for teachers:
- Do you already have approaches to assess students' performance or behaviour that use the 'everyone starts with an A' concept?
- How might you use the 'everyone starts with an A' approach in your school?
- Can you think of other ways to connect our knowledge about 'loss aversion' (or the other behavioural insights described) to improve pupils' achievement?

Another participant questioned the long term effects of such an approach, and suggested that this would reinforce the idea that school is "always about marks", although it could be argued that this has more to

do with whether marks were given based on learning (rather than strictly performance) than with whether the pupil starts with an A or starts from the bottom. Interestingly, pupils who do not 'defend' their top mark could be seen to be doubly punished: first for their feeling that they are not as good as some others, and second in their feeling the disappointment of loss of the initial high grade.

One inspiring suggestion was that classes could defend their grade as a group. This would call upon loss aversion and also may bring students together to achieve a shared goal, providing an incentive for students who are mastering the content to help out others who are struggling. With such an approach, it would be crucial to ensure the classroom has an appropriate culture of collaboration and support, to prevent the potential backfire of some pupils putting more pressure on (rather than helping) struggling pupils.

After the workshop and upon further reflection, more questions surfaced here at the RSA: If indeed a switch to loss framing did improve engagement, how important would it be to determine whether that engagement was the result of improved comprehension by the student, or changed perceptions by teachers (for example teachers may find it psychologically more difficult to dock points from someone than to build points up), or a combination of both. Further, would such a programme induce too much stress for the students? And how do we weigh that potential stress against improved attainment, assuming it improves? These questions are ripe for further exploration.

Practical recommendations, grounded in discussion with educators and experts

- **Perspective-taking exercises, for both students and teachers**, to mitigate the confirmation bias and halo effect: Workshop participants suggested that pupils should be encouraged to do role playing tasks where they are asked to adopt an opposing position. Extending this idea further, teachers may want to consider counter examples to their own prevailing impression of each pupil, in an effort to minimise the halo effect and provide a more balanced view of their students.
- **Structure incentives to evoke loss aversion.** This could take the form of each pupil starting with an 'A', or having a number of gold stars, with points or stars docked when appropriate. However, be mindful of the recommendations for praise, recalling that in any case the incentives should be related to effort rather than correct answers or personal traits which might cultivate a fixed mindset.
- **Have the entire class defend a grade**, to capitalise on loss aversion. Perhaps this collective grade is a supplementary grade to an individual personal grade.
- **Distinguish between evidence-weighing and case-building**, to mitigate the confirmation bias. Additionally, praise pupils for inclusion of counter-arguments.
- **Discuss these cognitive biases with colleagues and pupils.** Recognising these tendencies is often easier to do in others than

in oneself; greater discussion around how we think and our susceptibility to biases in judgment may help raise awareness and provoke discussions without seeming like a personal attack on the person exhibiting the bias.

- **Praise the process of an evaluation, not the outcome.** When speaking to colleagues or examining one's own evaluations, consider not just the final outcome, but how the decision was reached. Have you considered the influence of anchoring, the halo effect, confirmation bias, or loss aversion on your judgments, and tried to mitigate it?

6. Environmental cues

The environment around us, inside the classroom, outside, and the school building itself, can influence our behaviour in meaningful ways. In this section we explore the effect of subtle and not-so-subtle cues within the environment on pupil behaviour and associated achievement. Specifically we explore:

- Cues in the classroom (priming with grades, words associated with intelligence, and scenes of poverty)
- The effect of greenery on mental fatigue
- Teachers' perspectives
- Practical recommendations

Subtle cues in the classroom

Consider the following scenario: David, a teacher, splits his pupils into two groups to take a quiz, and there is an even split of ability in each group. One group he keeps in his classroom and the other group is moved to the classroom next door. The quiz is the same for the two groups. Teaching assistants are assigned to each classroom to administer the quiz. The classrooms are similar, with many big windows looking out onto the playground area. To keep track of who was in each group, the pupils are asked to write the number of their classroom (6 or 1) on the top of their quiz before starting. The pupils take the quiz and David grades both sets. The average score of the group in the second classroom is significantly higher than the average score of the group in the first classroom.

Why might the second group have performed better? It is possible that the room number placed on top of the pupils' quiz paper subtly *primed* them to perform better or worse.

Priming is a psychological phenomenon, and is the tendency for subtle cues in our environment to influence our behaviour. These cues can be so subtle that we don't even consciously notice them (or make a connection to our current behaviour). Numerous studies have been conducted demonstrating the effects of priming across several diverse areas. For example, priming people with subtle cues of money (such as having dollar bills floating on a computer screen saver, or leaving a stack of Monopoly money in the participants' peripheral vision) has resulted in greater self-sufficiency and less altruism: people ask for less help from others but also offer less to someone else in need (Vohs et al. 2006). Having people hold a cup of coffee or tea, subtly priming the concept of warmth, taps into our association of physical warmth with emotional warmth and leads the coffee-cup holder to evaluate a stranger as being a nicer, warmer person (Williams & Bargh 2008). Some studies particularly relevant to performance in the classroom are briefly reviewed below.

Priming with letter grades

A study by Ciani and Sheldon (2010), similar to the scenario illustrated above, explored the role of priming in the classroom.[18] Students were given a quiz, on which there was space to enter the student's name and a space for a (fictional) Test Bank ID code. One group of students were told that their test bank ID code was 'A', another group 'F', and a third group 'J' which carries no association to grading. Those in the A group had better test scores than those in the F group, and those in the F group performed worse than the neutral J group. Like with the loss aversion experiment exploring the role of incentives on performance discussed earlier in the report, this study is interesting because it does not affect the studying habits or intellectual capital accumulation of the students. Rather, it suggests that something – more or different effort, perhaps – may be happening at the time of the quiz that improves the pupil's performance.

Priming with cues of intelligence [19]

However, although the priming in the example above measured an immediate effect and not any changes to learning strategies, it is possible that priming can have longer-term effects. If the priming leads to a relatively immediate change in behaviour (for example on the quiz), this behaviour might serve as practice for a similar event further down the line (for example on an exam). Lowery et al. (2007) primed university students with cues of intelligence immediately prior to a practice quiz which was a few days before an actual midterm exam. The students were each at a computer terminal, and to prime them, they were engaged in what the researchers told them was a "perceptual task" prior to the practice quiz. In this perceptual task, a string of letters flash up, and the student has to indicate whether the letters were on the left or the right side of the screen. For some of the participants, the letters made words associated with intelligence, such as *intelligent*, *smart*, *educated*; for others the words were neutral such as *intact*, *smock*, and *edifice*. After the perceptual task they took the practice quiz.

The researchers found that those who were exposed to intelligence primes performed better on their practice quizzes than those who were exposed to neutral primes, with scores of 57.4 versus 47.8 on average,

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18. The study was conducted in the United States, where grading runs from A through F (except E), where 'A' is *excellent* and 'F' is *failure*.

19. Despite some recent controversy over priming research, the prevailing view is that the phenomenon of priming remains conceptually proven. The controversy arguably stemmed from two recent events; a Dutch psychologist named Diederick Stapels was found to be fabricating his data around the same time as the findings of a seminal study by John Bargh and colleagues were not able to be replicated by a group of researchers, Doyen et al. (2012), although they have been replicated by others. Doyen et al. suggest that the experimenters' expectations, rather than the word primes, might affect the participants' behaviour.

In the interest of providing a balance of evidence (as recommended in the previous section), it should be noted that a recent article (Shanks et al. 2013) ran a suite of studies on supraliminal priming participants with intelligence cues where they did not find any statistically significant results. The authors suggest that previous studies demonstrating similar effects may be false positives, citing confirmation bias among researchers (so that they are less likely to check for statistical errors when results are in their favour than when not), intentional malpractice (in the case of Stapels and co-authors), and a publication bias where journals favour publishing studies with positive results, as potential contributing factors.

While these events provide a call to the field to ensure prevention of academic fraud and to encourage the reproduction of existing studies, the phenomenon of priming remains largely uncontested (TES 2013).

respectively, (although the difference was not statistically significant[20] in one study) with a significant effect[21] in another nearly identical study (average scores of 83.3 versus 77.8). Additionally, this effect carried on to the actual midterm exam one to four days later; students originally exposed to intelligence primes significantly outperformed those exposed to neutral words. Finally, and perhaps unsurprisingly, those students who took a practice exam (regardless of whether primed with words of intelligence or neutral words) performed better on the actual midterm exam than did those students who didn't take a practice quiz.

It is suggested that although the prime itself is not thought to be recalled in the long term, the "subliminal priming may have long-term effects to the degree that the primes influence behavior on a proximal task that serves as practice for a distal task of interest" (Lowery et al. 2007 p.152). Interestingly, if participants were told that the perceptual task was designed to improve their performance on the practice exam, there was no difference in scores between those in the intelligence or neutral priming conditions. In contrast to the other two sections of this report which encourage engaging students in the process of learning about how behavioural insight might be applied in the classroom, this section provides less clear direction about whether or not to discuss these issues with the pupils themselves. This is because this last finding, that the effects of priming are reduced or eliminated when the person under consideration is aware of the attempt to prime (Lowery et al. 2007; Dijksterhuis & van Knippenberg 2000 as cited in Lowery et al. 2007) raises the question of whether and how best to discuss with the pupils the potential for cues in their surroundings to systematically alter behaviour.[22]

Priming with cues of affluence or poverty

Those exposed to the images of poverty demonstrated impulsivity

Not only does it seem that fine-grained specific priming might affect pupils in the classroom, but also larger environmental cues may be influencing their performance. Liu and colleagues (2012) studied the effect of images of poverty on people's preferences for delayed gratification. The researchers gave participants a stack of images and asked them to count the number of people in the pictures; afterwards the participants were asked whether they preferred to be paid a small wage for the task immediately or a larger wage later in a few days time. For some, the images they reviewed were scenes of poverty, for others, the scenes were of affluence. Those exposed to the images of poverty demonstrated impulsivity, preferring a small reward now to a larger reward later (Liu et al. 2012). In a school context this might be analogous to preferring to watch some TV now over doing homework, whereas doing homework results in the larger reward of improved performance in school later.

This is important because the ability to delay gratification is considered by many to be a non-cognitive skill that has significant influence on

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20. With a p value of p=0.18, indicating that with 82% likelihood, the difference between the two scores was not down to pure chance.

21. p< 0.05

22. To our knowledge there is no work examining whether the influence of greenery on attention restoration is affected by whether or not the person is aware of the influence; this could be an interesting area for further study.

academic performance and a role in fostering success[23] in later stages of life. Walter Mishel's seminal study, now referred to as the "marshmallow experiment", explored whether and for how long a child would refrain from eating a treat given the promise of an exchange for two treats later. A host of outcomes were subsequently measured later in life (such as Scholastic Assessment Test scores), and those children who delayed their gratification (by choosing two treats later over one treat now) were found to have higher SAT scores, and their parents rated them as being better able to plan, handle stress and concentrate without being distracted (APA n.d.). These studies have been interpreted as demonstrating self-control. More recently, results of a longitudinal study of over 1,000 people from birth to age 32 by Terrie Moffat et al. (2011) found correlations between self-control (broadly the ability to "delay gratification, control impulses, and modulate emotional expression") and various life outcomes. Greater self-control was found to be correlated with higher SES and higher intelligence, but even controlling for both SES and intelligence, high self-control in children predicted not dropping out of education in later years, and various measures of health and wealth when the participants reached 32 years of age.

Additionally, the *perseverance* component of Angela Duckworth et al.'s (2007) "grit" undoubtedly requires the ability to delay gratification to stay on course. In fact, in a recent article Duckworth suggested that future research might explore the relationship between the ability to defer a benefit and grit (Duckworth and Eskreis-Winkler 2013). Programmes that aim to foster in pupils what Paul Tough (2012) describes as "character", a combination of grit, self-control, zest, emotional intelligence, gratitude, optimism, and curiosity, have been reported as educational success stories. What these paradigms have in common is the view that non-cognitive skills are a crucial component to academic success. That the environment within which a pupil is learning influences and can affect these non-cognitive skills deserves some additional research and attention.

However, for the purposes of the attainment gap in particular, it should be noted that in environments of unreliability, delaying gratification – which is traditionally considered to be an exhibition of self-control – might actually be a suboptimal strategy. Kidd et al. (2013), in a creative adaptation of the original Walter Mishel marshmallow study, found that when the children were in an unreliable environment where they had experienced the experimenter not following through with a promise previously, they waited a much shorter time on average before eating the marshmallow. Outside of a lab, in real situations where children may live in environments of poverty, unemployment and arguably more instability than those of higher-SES children, preferring a small reward immediately may be the most lucrative strategy given the potentially short time horizons before circumstances change, since there is good reason to believe that the promise of a larger reward may never materialise.

The effect of greenery on mental fatigue

The visibility of 'green' space such as grass, trees, or other nature has been shown to have a significant effect on various personal dispositions such as

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23. Success as measured by objective accomplishments such as those around schooling, obtaining a degree, or employment (Duckworth et al. 2007).

Participants with a barren view on average scored lower on an attention task, and felt less effective in managing their major issues

attention, aggression, delaying gratification and others (Kuo 2001; Kuo & Sullivan 2001; Sigman 2012), all arguably important factors in educational attainment. Pupils of low SES are more likely than their high SES peers to live in an area deficient in green space (Jensen 2009), and thus may be presented with even more challenging circumstances to raising their academic performance.

Kuo (2001) studied the residents of two architecturally identical social housing buildings with different outdoor views to explore the effect of a green view on the management of major life issues, mediated by the attention restoration (Kaplan 1995, as cited by Kuo 2001) that a view of natural vegetation can produce. That is, Kuo found that attention is an important resource to help manage major life issues effectively, and that participants with a barren view on average scored lower on an attention task, and self-assessed themselves as being less effective in managing their major issues. The attention task was to repeat a series of numbers back to the interviewer in reverse order. Regarding effectively managing longer term issues (deemed major by the participants themselves, such as returning to education or finding employment), residents with a barren view procrastinated more in addressing these issues, and found the issues to be more difficult, severe, and long-standing than those with a greener view, controlling for all demographic variables.

A subsequent study found that mental fatigue plays a role in aggression by inhibiting deliberative thinking (thus calling upon more automatic responses), by increasing irritability, and by decreasing control over impulses. "As the individual's willingness and ability to engage in more reflective, effortful processing decreases with mental fatigue, social behavior is likely to become increasingly thoughtless, tactless, and unstrategic, allowing conflicts to spiral out of control.... In school settings, deficits in effortful processing are likely to manifest in inattentiveness, and inattentiveness has been closely tied to aggression in both children (Stewart, 1985) and adolescents (Scholte, van Aken, & van Lieshout, 1997)." (Kuo & Sullivan 2001 p546). The researchers found that exposure to a more natural environment of grass and trees was correlated with lower scores on several measures of psychological and physical aggression,[24] again mediated by the reduction of mental fatigue seemingly prevalent in areas of socioeconomic deprivation.

Together these studies demonstrate that access to green space has implications not only for day-to-day or short term tasks, such as the activities within a classroom or completing homework, where attention and social skills matter for performance, but also on longer term, potentially path-dependant issues such as choices about further education or career.

Broken window theory?

The effects of a pupil's surroundings, including visible signs of poverty or lack of green space, on their behaviour and learning suggest that the school building itself may be contributing to the poor performance of students in low-SES areas. At this point it could be worthwhile to reference

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24. This relationship was found for many measures of aggression; however, it was not significant for acts of violent (compared to mild) physical aggression or parental aggression towards their children.

an opinion expressed at the focus group about the use of behavioural insights in educational policy and practice in general. While the educators we spoke to were unanimous in stating that the psychological wellbeing of the student is crucial in education, some thought that, while undoubtedly helpful, focusing on behavioural insight is somewhat of a luxury, and that the poor state of some school buildings is a more important thing to remedy in the first instance. The insights above about how an environment of poverty (or even just the *perception* of an environment of poverty) can influence pupils psychologically – even beyond the physical consequences to health and safety of being in a poor building – provide support for the already prevalent feeling among the educators with whom we spoke that school buildings should meet some minimum standard.

A well-maintained school building may also prevent a potential downward spiral of poor maintenance and vandalism of the physical environment. This idea stems from the 'broken windows theory' proposed by Wilson and Kelling in 1982. The theory, originally used to prescribe crime deterrence, and now sometimes cited as support for 'zero-tolerance' policies, may be relevant here as well: if a city exhibits signs of petty crime, such as broken windows or graffiti, it may be interpreted as a signal that this crime – and worse crime – is tolerated and there is little care for the building or community. This may be the factor that tips people over the line from committing a crime in the area or going elsewhere to commit it, and may erode law-abiding citizens' sense of self-efficacy to maintain social order. Plank et al. (2006) examine the broken window theory in the context of education and find that indeed visible signs of neglect were associated with pupil misbehaviour, and lower faith in teachers that they could maintain order. Harcourt and Ludwig (2006) find no evidence that the broken window theory works to deter crime in the way initially theorised, and Levitt and Dubner (2005) suggest that an altogether different initiative (from heavily policing petty crime) was the reason for observed drops in major crime. However, even if the broken window theory does not work to deter major acts of deviance by signalling lenience to potential criminals or marginal students, it is entirely plausible that it does go some way to deter petty deviance by simply creating a social norm of respect for the surroundings which people are likely to adhere to given the contagion of social behaviour.

Physical aspects of the school environment do influence a school's effectiveness

A study published in the journal *Buildings and Environment* finds that the built environment of a school, including its degrees of naturalness, individualisation, and stimulation can significantly affect a child's learning progression. Specifically, the study finds that the quantity of natural light and the quality of artificial light, the degree of choice (of e.g. furniture) and flexibility of the space, the colours used in the classroom, and the complexity of the building all had an effect (Barrett et al 2013). Additionally, a Department for Children Schools and Families (DCSF) technical report (2007) about evaluating the effect of school buildings on learning cites Woolner's et al. (2007) meta-review on the effects of building appearance on teaching and learning. Evidence demonstrates that physical aspects of the school environment do influence a school's effectiveness, and a new build or renovation can improve pupil motivation and engagement. The findings appear to suggest a diminishing marginal return to school appearance; that is, greater benefit is derived from

improving from a poor quality of school building or classroom to an adequate quality than there is in moving from an 'already adequate' to a better quality building or classroom. This suggests that policies would be well placed to target those buildings showing signs of poverty or lack of maintenance.

Table 3: The effects of suroundings on pupil performance

Environmental cue	Effect on pupil
Grades (letters)	A 2010 study found that having pupils write the letter 'A' on their quiz improved performance over those who wrote an 'F' instead, demonstrating a direct effect on performance (without affecting study habits).
Words associated with intelligence	A study finds that subliminally exposing people to words associated with intelligence led to better performance on a mock exam immediately after the exposure, and a real exam several days later (through the improved mock exam performance).
Poverty	Cues of poverty encourage impulsivity, or preferring an immediate reward now to a potentially more rewarding outcome in the future. This could mean, for example, preferring to have fun or watch TV now, rather than doing homework which contributes towards getting better grades in the future.
Nature or 'green space'	A barren view has been linked to mental fatigue, lower attention, higher aggression, and a lower perceived ability to deal with major issues effectively, all of which may affect performance and behaviour in the classroom and on longer term, potentially path-dependant choices about education.

The school environment, including subtle cues and access to green, natural views, may affect pupil performance in several ways, as summarised in table 3, and clearly relates to educational disadvantage. In addition to any direct effects of having inadequate resources (such as a lack of books), a deficient school environment may affect both the pupils' psychological health and their learning dispositions through access to a green view of nature and removal of signs of poverty; additionally, particular surroundings may change the level of effort pupils exert or their self-perception through various cues that subliminally prompt certain ideas. The research described above lays the foundation for promising further exploration of how the classroom environment shapes performance in education.

Teacher impressions

The workshops with educators in Berlin were used to discuss how changes to the classroom environment might influence pupils and impact attainment.

The teachers agreed that how well a building is maintained seems to be an important factor in learning, to the extent that they can feel comfortable and settled within the building. Some stated that it was not so much a matter of having state of the art equipment, but rather was about "showing a kind of appreciation to our students and the time they're spending in school".

Discussing the scenario of David's quiz detailed at the start of this section, some participants wholly agreed that people in general are subject to the effects of priming, whereas others thought that students would be "clever [enough to] recognise if we tried to manipulate them", reflecting

his/her impression that priming would be considered a manipulative approach. One participant replied that as a practical solution to avoid having numbered classrooms, at his/her school they name the classrooms by the teacher's initials.

A suggestion from one educator is to have pupils write the score they hope to achieve ("are reaching for") on the front of their exams before the test, and although this suggestion was given in the context of priming, it may call upon effects of pupils' self-perception and self-fulfilling prophecies as well.

In the survey, those in our sample of educators in England were given a scenario similar to the one listed at the start of this section and asked what factors they think may have played a part in the performance difference between the two groups. [See Appendix 1 for the scenario provided in the survey of English teachers]. While the most popular answer was "I don't know", with 40% of the sample selecting it, it seems that at least some teachers, about one in five, consider priming to be a possible contributing factor, with 22% selecting the option "the letter A on the top of the paper subtly influenced the pupils to perform better".

Other popular answers were: "the pupils enjoyed being in a different classroom to usual" (27%); "some other reason" (19%) including that one TA delivered the question better (3%), that one TA "helped" the students (2%), or pure chance (1.5%); "some in the second group cheated, raising the average score" (9%); and finally, "having a female administer the quiz was better for the pupils" (3%).

In aggregate these results provide an indication that some teachers are aware of the potential effect of priming and think that environmental factors such a change in classroom might affect performance, but would attribute a difference in scores (among a group of randomly split pupils) to many different possible factors.

Practical recommendations, grounded in discussion with educators and experts

- **Consider the use of priming with grades and intelligence cues** for example by asking students to place an 'A' on their exams, potentially affecting effort and performance.
- **Provide a green view from the classroom:** To help those students who do not have access to green space at home, schools should consider ensuring that at least some space on the school grounds has access to nature (with grass, bushes, trees, etc.) in which pupils are encouraged to play or spend other time, to help regulate these dispositions and reduce attentional fatigue. Where outdoor access to green space is limited, consider keeping some indoor potted plants in the classroom. By offering each pupil or each group of desks a potted plant at the beginning of the year to care for throughout the academic year, there may be collateral benefits of offering responsibility and cultivating care and curiosity.
- **As far as possible, ensure school buildings are maintained to an extent where physical signals of poverty are minimal.** This may help to prevent an added burden on performance of a culture of short-termism and impulsivity.

7. Sustaining behaviour change: implications for teachers' professional development

Having the practical and emotional support of colleagues helps teachers to overcome their natural fears or embarrassment in the face of unfamiliar practices

In the previous sections we elucidated some key concepts from the field of behavioural science, drawing out the insights which appear most relevant to the context of schooling and education. We turn now to the important behavioural question of how to embed new professional learning within the culture of the school, so that teachers are supported to improve their practice and sustain improvements over time. From a behavioural insights perspective, we can see that it is very unlikely to be enough simply to inform teachers about 'cognitive biases' or 'growth mindsets'. The kind of behavioural change involved in transforming often deeply held or long-established beliefs and practices requires a more structured set of responses at the school and system level.

Systematic reviews of the research evidence on teachers' professional learning have produced a surprisingly coherent and consistent set of findings, which identify a common set of features of effective programmes (Timperley et al. 2007; Cordingley et al. 2003, 2005, 2007). One of the chief findings is the importance of peer support and professional dialogue as a way of embedding new ways of working in teachers' day-to-day practice. Having the practical and emotional support of colleagues helps teachers to overcome their natural fears or embarrassment in the face of unfamiliar practices, making it more likely that they will persist in following the new approach.

Collaborating with trusted colleagues helps to create a safe environment for teachers to make explicit the tacit beliefs and assumptions that underpin their teaching, as well as increasing their self-awareness by putting themselves in the shoes of others. Successful programmes of teacher learning also require specialist expertise from outside the immediate environs of the school. The research suggests that if they are simply conferring with colleagues who share a similar mindset, it is less likely that teachers will be challenged to adopt new ways of working. By developing their own core professional knowledge and understanding in collaboration with others, teachers are better able to resist the "pull of the status quo" (Desforges 2003).

Simply analysing current practice is unlikely to promote significant improvements in teachers' understanding or offer benefits for students: the evidence suggests that effective professional learning needs to be rooted in evidence gained from experimenting with new approaches. Teachers need to develop the capacities of 'enquiry-oriented practice', learning to assess what the outcomes have been, and reflect upon the reasons for the apparent success or failure of the new approach.

To understand how effective programmes succeed in changing educational practice and sustaining it over time, we need to look more closely at the hidden processes that take place inside the black box of teacher and student learning. Timperley et al.'s (2007) Best Evidence Synthesis (BES) identifies three core cognitive processes involved in learning, which are distinct though not mutually exclusive:

1. Cueing and retrieving prior knowledge: consolidates prior knowledge by bringing to the surface for reflection and (re)examination;
2. Becoming aware of new information and skills, which are consistent with current values and beliefs – and so can be readily integrated into existing learning and then incorporated into practice;
3. Creating dissonance with a teacher's current position: when new information is incongruent with existing views, values and beliefs; may be resolved by accepting or rejecting what is proposed.

Being exposed to a new source of information can be effective in prompting teachers to look again at taken for granted assumptions about their own practice

Although learning which builds on prior knowledge is more likely to be integrated, creating dissonance can also be a powerful way to achieve deeper learning. As part of their comprehensive *Best Evidence Synthesis*, Timperley et al. (2007) returned to a sample of original (New Zealand) studies to understand how professional learning occurred. Case studies suggest that moments of dissonance can be an important way to challenge and expose tacit beliefs and trigger reconstruction of current knowledge. As the studies describe, being exposed to a new source of information – for example, through feedback from professional colleagues or from students – can be effective in prompting teachers to look again at taken for granted assumptions about their own practice. Particularly relevant in the context of educational disadvantage, the studies found that teachers were "typically unaware of the impact of their prevailing discourses on the way they thought about and taught students". Successful interventions helped teachers to develop this awareness, either by directly challenging negative assumptions about what students could not or would not learn to do, or by showing teachers that their students could learn if taught differently. As a result, the way that teachers talked about students and their parents shifted from blaming them for poor achievement, to focusing on the detailed strategies needed to meet their diverse learning needs (Timperley 2007, p. 167). Creating dissonance through being exposed to new information can be particularly effective in challenging teachers' social construction of students, especially in relation to expectations of achievement for some groups of students (such as those from disadvantaged backgrounds).

The point here is that the practical recommendations that we have put forward in the previous sections are only part of the bigger picture of what is required for deep, sustained change in the classroom. The provocative nature of this report may be the catalyst or rationale for the teacher to engage, and in this sense the recommendations are valuable talking points. But reading these recommendations alone will probably not be sufficient for most teachers to enact the change required, as teachers will need support from their colleagues and managers both informally and formally through a programme of professional development to help cement ensuing behaviour change.

School heads, managers, and system leaders will need to support teachers in integrating behavioural insights into their teaching practices. They can do this through providing a structured programme of professional development which includes a series of activities to a) translate the new knowledge into practice (which is done to a large extent through our proposed practical steps), b) offer repeated opportunities repeat and refine the new knowledge, and c) refine the new practice in the classrooms. These steps are put forth by Timperly et al. (2007) as best practice for professional learning.

Integrated into a professional development programme could be the elicitation of a public commitment by the teachers to challenge their own assumptions. This small practical step, rooted in the tendency for us to want to be consistent with our stated intentions (Cialdini 2009), could be a helpful tool to support continuous change.

In conjunction with the suggestions above, leaders within schools should allow the space for teachers to discuss these behavioural insights openly with their colleagues and managers to promote and sustain active learning.

Taken together, providing teachers with information about behavioural insight, allowing points of dissonance to emerge, structuring multiple points of learning to translate knowledge into practice and then repeating and refining the practice, and allowing teachers the space to openly discuss their knowledge about and application of behavioural insight, will help to create a culture of 'cognitive literacy' or 'behavioural insight awareness' among teachers. This culture may help to uncover some of the unexpected influencers of the teaching and learning processes critical to an effective and equitable provision of educational opportunity.

Recommendation:

- **Build learning about behavioural insight into professional development programmes for teachers.** These programmes could use this report as a catalyst for teachers to engage, and then support the teachers through providing opportunities to translate the knowledge into practice, repeat the knowledge, and refine the practice; the use of a commitment card with stated intentions to integrate behavioural insight into the classroom could be beneficial here.

A culture of 'cognitive literacy' may help to uncover some of the unexpected influencers of the teaching and learning processes critical to an effective and equitable provision of educational opportunity

8. Concluding remarks

Narrowing the socioeconomic attainment gap is not a small task. Many countries have reformed – and continue to revise – their educational policy and practice in an effort to move some steps forward in closing the divide between low-SES and high-SES school children. To date, in Germany these changes have indeed helped to lessen inequality, but are still some considerable distance away from creating a fairer and more equitable system, where educational attainment is only weakly correlated with social class. Having made substantial inroads along the school improvement journey thus far, Germany's challenge now will be in moving beyond 'good' and into a 'great' or 'excellent' education system.

Taken together, the evidence reviewed in this paper suggests that insights from behavioural science could be usefully applied to the challenge of narrowing the attainment gap in many ways. From improving effort and enjoyment levels of underperforming pupils, to understanding educators' assessments of pupils at the micro level in order to address the nature and quality of teaching and learning processes, to examining the very nature of the public and political discussion of education reform at the macro level in order to understand some of the challenges to sustained improvement, the application of behavioural insight to education policy and practice may potentially help to move forward along the path to such an equitable system.

Some might view using social science insights about mindsets, cognitive biases, and the influence of our surroundings as an insubstantial or peripheral solution to an intractable problem. However, as stated in the introduction, we are not suggesting replacing wholesale existing or even potential reform tackling structural and distributive issues. Instead, the research behind these behavioural insights provide a strong explanatory framework for traditional reforms, for example by providing the psychological basis for why school buildings should be physically maintained to an adequate standard, or by providing an alternative understanding of why levelling performance through early years programmes may help to prevent a vicious cycle of poor expectations and unintended bias. Behavioural insight is not just a "nice to have" optional bag of tricks, but rather it provides us with an updated and accurate account of how we are, helping us to understand what underpins and drives behaviour. Developing initiatives which do not include this insight would be to potentially miss out on this and the associated effectiveness. Behavioural insight alone is certainly not sufficient to cure educational disadvantage, but it may be a necessary component of a larger whole.

Teacher handout
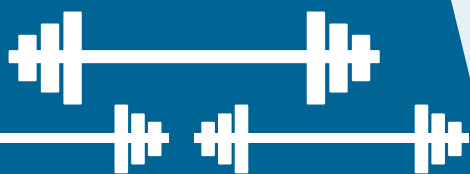
Mindset
Think about ability like a muscle that can be strengthened

- Praising pupils for effort instead of intelligence to help instil the idea that effort is key and intelligence is not a fixed trait. For example, try "great, you kept practicing" instead of "great, you're really clever".

- Becoming the lead learner. Educators can shape mindset through modelling it for the pupils.

- Giving a "not yet" grade instead of a "fail" to set the expectation that with the right support and mindset, a struggling pupil is not destined to perpetual failure.

Cognitive biases
Our judgements and thinking patterns might surprise us

- Perspective-taking exercises, for both pupils and teachers, to mitigate the confirmation bias and halo effect, providing a more balanced view of the subject or of other people.

- Structuring incentives to evoke loss aversion. Consider having each pupil start with an "A" or a number of gold stars, with points or stars docked when appropriate.

- Discussing cognitive biases with colleagues and pupils. Recognising these tendencies is often easier to do in others than in ourselves. Greater discussion around how we think may help raise awareness without seeming like a personal attack on the person exhibiting the bias.

Surroundings
Cues in the classroom environment matter

- Priming with grades and intelligence cues for example by asking students to place an "A" on their exams, potentially affecting effort and performance.

- Providing a green view from the classroom or keeping potted plants indoors, to help regulate certain dispositions and reduce mental fatigue.

- Ensuring school buildings are adequately maintained and physical signals of poverty are minimal. This may help to prevent a culture of short-termism and impulsivity.

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Appendix:
Priming question for
English audience

Please carefully consider the following scenario:

David, a teacher, splits his pupils into two groups to take a quiz, and there is an even split of ability in each group. One group he keeps in his classroom and the other group is moved to the classroom next door. The quiz is the same for the two groups. Teaching Assistants Fred and Abbie are assigned to each classroom to administer the quiz.

The classrooms are similar, with many big windows looking out onto the playground area. To keep track of who was in each group, the pupils are asked to write the letter F or A (for Fred or Abbie) on the top of their quiz before starting. The pupils take the quiz and David grades both sets.

The average score of the group in the second classroom is significantly higher. Why do you think that might be? *(Select all that apply)*.

- The pupils enjoyed being in a different classroom to usual
- The letter A on the top of the paper subtly influenced the pupils to perform better
- Having a female administer the quiz was better for the pupils
- Some in the second group cheated, raising the average score
- Some other reason (please state)
- Don't know

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