

The impact of attitudes and aspirations on educational attainment and participation

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This review examines whether the attitudes, aspirations and behaviours of young people and their parents influence educational attainment and participation.

The 'poverty gap' in education means that children from poorer families tend to do less well at school and beyond. It is crucial to know whether this situation can be improved by activities to enhance the beliefs and behaviour of the most educationally marginalised families. If attitudes and aspirations do cause higher levels of attainment, then appropriate interventions can be developed. But if they do not, then money and effort is being wasted on approaches that may even have damaging side effects. This all-encompassing review of existing evidence provides summaries on a range of areas, from parental expectations to child substance abuse.

The review:

- presents a model of causation for social science;
- provides information from almost 170,000 pieces of evidence;
- summarises the effects of 13 different kinds of belief and behaviour;
- highlights the implications for policy, practice and future research funding.

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Executive summary

Background

This review synthesises the available evidence on the causal impact on educational outcomes of aspirations, attitudes, and behaviours (AABs) of young people and their parents. The educational outcomes considered are attainment and post-compulsory participation. **Attainment** is an individual's level of success in educational assessments of any kind. A key indicator might be a young child's school readiness, such as the ability to read letters of the alphabet and count to ten. Another could be the level of qualifications gained by the end of compulsory schooling. **Participation** concerns an individual's educational and work trajectory after the end of compulsory schooling. A key indicator might be a young person's enrolment in further or higher education.

A search of the eight main educational, sociological and psychological electronic databases supplemented by other means yielded 1,827 potentially relevant reports of research. This literature included 13 distinguishable kinds of aspiration, attitude or behaviour for parents or their children. Where a possible AAB is not listed here, that is because it was not discovered in the literature (parental motivation is one example).

Four of these AABs focus on the parents:

Parental involvement	Parenting style	Parental expectations	Parental substance abuse
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Parental behaviour relevant to the child ranges from conception (prenatal health and risk), through preschool (interaction with toddlers) to school (involvement in homework and choices) and beyond. Possible indicators include parents reading to children, their rules about the timing of meals and bedtimes, and parents' engagement in risky behaviour such as drug use. **Parental expectation** here refers to what an individual believes will happen in the future. A key indicator might be a parent's report of their child's likely success in a forthcoming test.

Five AABs concern the attitudes and aspirations of the individual child:

Self-concept or esteem	Self-efficacy or locus of control	Aspiration	Motivation	Attitude
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Self-concept is an individual's perception of themselves. A key indicator might be a child's perception of the relative economic status of their family. **Self-esteem** is closely related to self-concept, and refers to an individual's evaluation of their own worth or goodness. A key indicator might be a child's perception of significant others' beliefs, expectations and attitudes about them. **Self-efficacy** is an individual's belief in their own ability to achieve something. A key indicator might be a child's belief about their cognitive abilities in a particular subject area. **Locus of control** is very similar in definition to self-efficacy, and refers to an individual's belief that their own actions can make a difference. A key indicator might be a child's belief about the importance of making an effort to ensure success.

Aspiration is what an individual hopes will happen in the future. A key indicator might be a child's reported desire to continue with education post-16. **Motivation** is both the reason why an individual makes a decision, and their strength of purpose in carrying these decisions out. A key indicator might be a child's reported belief that schooling is important for their future. **Attitude** (other than those 'attitudes' dealt with separately) is an individual's feelings about education. A key indicator might be a child's expression of liking or dislike for school.

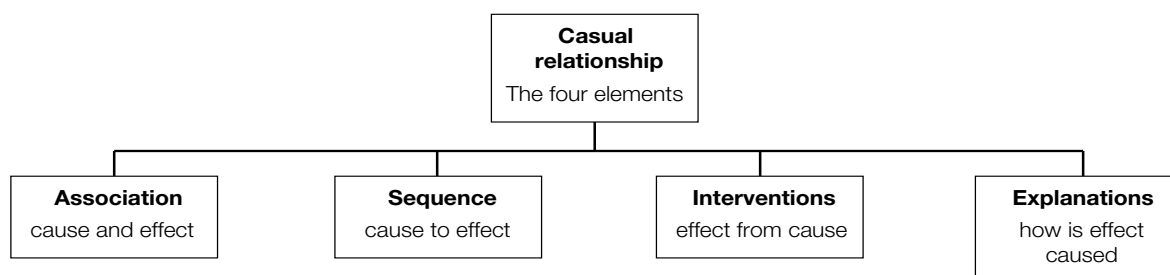
The final four AABs concern the behaviour of the individual child:

Extra-curricular activities	Paid work	Substance abuse	Poor behaviour
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Child behaviour includes risky behaviour, such as smoking, and potentially improving actions and habits, such as physical exercise. Other possible indicators include school attendance and engagement, and antisocial behaviour at school, such as classroom disruption or bullying.

The review argues that four types of evidence are necessary before a causal relationship can be considered to be fully established between a particular type of AAB and attainment or participation. These four types of evidence are illustrated in the figure below.

Figure 1: Types of evidence required to establish a causal relationship



Association means that an aspiration, attitude or behaviour is clearly linked to an educational outcome, so that they vary in value together. For example, this might mean that children with higher expectations also have more success at school, and that children who do worse at school have lower expectations. Association is usually presented as a correlation between two or more variables.

Sequence means that the AAB that is supposed to cause the improvement in attainment or participation can be shown to have existed before it, and that it can be used to predict later attainment or participation. For example, this might mean that a child's high expectations are shown to come before the onset of success at school. A sequence is usually portrayed by a longitudinal study.

Interventions means there must be evidence that controlled interventions have altered the level of any AAB, and so produced changes in attainment or participation that cannot be explained in any other way. For example, this might mean that a programme of raising children's expectations also raises their attainment. Such an effect may be tested in a number of robust ways, most notably via a randomised controlled trial.

Explanations means there must be a plausible account of how an AAB could influence an educational outcome. For example, this might mean that there is a clear, simple and widely agreed mechanism that can explain how and why differences in expectations between pupils are converted into differences in school outcomes. The explanation must be easy to test and make the fewest assumptions necessary to provide a mechanism linking cause and effect.

Evidence for each of these elements must be present in order for the review to be confident that any relationship is causal, although no one study would be expected to contribute relevant evidence on all four. For some AABs and some educational outcomes, there is evidence in this review for only one or two

of these elements. Here there may be case for further research of a particular kind, to determine whether there is truly a causal relationship that can be a sound basis for approaches aimed at raising educational attainment or increasing participation. As is shown below, the lack of robust evidence of successful interventions is a particular gap for several types of AABs.

It is important to note that the results presented are for this new review of evidence. It is by some way the largest ever conducted on this topic in the UK, with over 166,000 pieces of research considered. However, it is inevitably incomplete. The review is not about educational improvements unrelated to AABs, nor is it about the AABs themselves. It only addresses the 13 AABs found in the search. The team focused on recent research reports written in English, not exclusively about special needs provision, using eight databases of educational, psychological, and economic research (but not health, for example).

For more details on this background, see Chapters 1 to 4 of the main report.

Key findings

The summary results are presented in colour-coded format (see colour key) – dark blue for promising, medium blue for indicative evidence, and pale blue for unpromising – and grouped by parents’ AABs, then children’s aspirations and attitudes and, finally, children’s behaviours. The colour is a judgement based on the quality, quantity and overall consistency of the evidence, as presented in Chapters 5 to 7 of the main report. Elements are shown in grey where that type of evidence was weak or non-existent.

Colour Coding

Evidence of complete causal model	Indications of causal model	Insufficient evidence for causal model
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Parental aspirations, attitudes and behaviours

The review found evidence of an association between parental expectations and their child’s attainment, and three of the four causal criteria were met at least in part. However, the evidence falls short of that needed to assume that it is a causal influence, because no relevant rigorous evaluations of interventions were found. There were, therefore, no clear indications that parental expectations could influence later participation. Perhaps, work in this area could be more fruitfully pursued, not in isolation, but as part of the development of interventions for parental involvement.

Parental expectations	Association	Sequence	Interventions	Explanation
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Parental involvement in their child’s learning was the only area reviewed with sufficient evidence to meet the four criteria for a robust causal model, and then only as a cause of attainment (not participation). There is a reasonable case that parental involvement is a causal influence on their child’s school readiness and subsequent attainment. The next step here would be to design and engineer cost-effective interventions, and to monitor them in operation. There is a much weaker case that parental involvement is a causal influence on a child’s participation in post-compulsory education. The next step here would be a focused search for further evidence relating to this area, with a view to commissioning research where it is needed.

Parental involvement	Association	Sequence	Interventions	Explanation
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There is very little evidence from this review that combating parental substance abuse has a discernible benefit for either attainment or participation. Assuming that interventions to reduce parental substance abuse are developed or in use for different outcomes anyway, any improvements in children's education would be a bonus.

Parental substance abuse	Association	Sequence	Interventions	Explanation
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The review confirmed the association of certain parenting styles, such as authoritative rather than authoritarian, with higher attainment. However, the evidence falls short of that needed to assume that it is a causal influence, both because the evidence of sequence was so sparse, and because there were no relevant interventions. This issue could be subsumed within the more promising line of work on parental involvement. No evidence was found that parenting style was a cause of later participation in education.

Parenting style	Association	Sequence	Interventions	Explanation
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Individual aspirations and attitudes

The review confirmed the association between children's expectations/aspirations and their attainment. However, the evidence falls short of that needed to assume that it is a causal influence, because no relevant rigorous evaluations of interventions were found. There were no good indications that a child's aspirations could influence later participation. For both outcomes, a judgement has to be made whether a controlled intervention study would be ethical.

Individual aspirations	Association	Sequence	Interventions	Explanation
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Not enough evidence was found in this review to suggest a causal link between attitudes to education and attainment or participation. There was no clear evidence of association or sequence between pupils' attitudes in general and educational outcomes, although there were several studies attempting to provide explanations for the link (if it exists). This example illustrates the point that it is possible to create a plausible explanation for something even if there is almost no evidence that it is needed. In many ways, the explanation is the least important aspect of any causal model.

Individual attitude	Association	Sequence	Interventions	Explanation
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The same is generally true for motivation. However, within the studies of individual motivation and attainment there were a few interventions, which involved offering pupils an extrinsic (usually financial) motivation for results, that showed some promise. This is worth pursuing, perhaps funded by the Pupil Premium. No relevant evidence was found on motivation and participation.

Individual motivation	Association	Sequence	Interventions	Explanation
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The evidence on child's self-concept or self-esteem falls short of that needed to assume that it is a causal influence on attainment. This is largely because so many studies found no association after

controlling for prior measures like attainment at an earlier stage of education. It is unlikely that the ongoing debate in the literature about the sequence of events here can be resolved without some more closely controlled and independent trials. No evidence was found that a child's self-concept or self-esteem was a cause of later participation in education.

Individual self-concept or self-esteem	Association	Sequence	Interventions	Explanation
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The evidence on child's self-efficacy or locus of control falls short of that needed to assume that it is a causal influence on attainment, largely because (as with self-concept) the sequence is unclear. There is also a shortage of good intervention studies. Almost no evidence was found that a child's self-efficacy or locus of control was a cause of later participation in education. A good reason would have to be found to justify continuing work in this area.

Individual self-efficacy or locus of control	Association	Sequence	Interventions	Explanation
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Individual behaviours

The review found some indicative evidence of the influence of extra-curricular activities, after-school clubs, and participation in sports on attainment. This falls short of that needed to assume that it is a causal influence, both because so little evidence was found, and because of the lack of controlled comparisons. However, work in this area might repay further and more rigorous investigation, since, like parental involvement, it shows a small amount of promise for participation as well as attainment.

Extra-curricular activities	Association	Sequence	Interventions	Explanation
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In general, not enough evidence was found in this review to suggest a causal link between individual paid work while at school and attainment or participation. There was no clear evidence of sequence, and no evidence from interventions on how much paid work pupils did while still in full-time education.

Individual paid work	Association	Sequence	Interventions	Explanation
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In general, not enough good evidence was found in this review to suggest a complete causal link between poor pupil behaviour and attainment or participation. There was insufficient clear evidence of association or sequence from poor behaviour to either educational outcome. However, there were a few promising interventions of reasonable quality, and so this area could also justify further work.

Individual poor behaviour	Association	Sequence	Interventions	Explanation
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There is little evidence from this review that combating child substance abuse has a discernible benefit for either attainment or participation. There is slight evidence that intervening to reduce cannabis

use among young adolescents could be effective. Assuming that interventions to reduce child substance abuse are in development or use for different outcomes anyway, any improvements in education would be a bonus.

Individual substance abuse	Association	Sequence	Interventions	Explanation
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For more details see Chapters 5 to 7 of the full report.

Recommendations

Some of the 13 aspirations, attitudes or behaviours covered in this review have such a limited or otherwise unpromising evidence base that it is not worth pursuing them at present, if the only reason for doing so is to improve educational outcomes. These include parental and individual substance abuse, children’s general attitudes to education, and the amount of paid work they do during schooling. All of these are coloured red in the key findings above.

There has been very little rigorous work on the causes of post-compulsory participation in education, which is quite surprising given that widening participation has been a favoured policy for more than a decade in the UK. It is time for research that tests more rigorously the role of aspirations and motivation in prompting young people to stay on in education.

The evidence in most areas is generally too immature at present to estimate the effect sizes or the costs of any type of intervention. It is important, therefore, that future work moves towards estimates of both, which can then be broken down into estimates of cost-effectiveness for specific sub-groups of learners, such as low attainers and families of low socio-economic status (SES).

Much of the work found in this review on the causes of attainment was conducted in the USA. Its results are relevant to the experience on this side of the Atlantic, but it would be helpful to see more of this kind of work, concerning both participation and attainment, being carried out in the UK, and reflecting the country’s specific context and culture.

It is noticeable that it is possible to devise a plausible explanatory mechanism for the effect of any of the 13 AABs covered in this review, even where there is little or no empirical evidence of any effect. This suggests that the mechanism is the least important part of any causal model. If it is clear that altering an AAB works to improve educational outcomes with no damaging unintended consequences and at reasonable cost, then it matters less if the mechanism is not understood. On the other hand, even the most convincing explanation is of less consequence if the AAB has no discernible effect on educational outcomes (or if the effect is damaging). Both are important elements of a full causal model, and in terms of devising and rolling out the most cost-effective improvements to the education of poorer children. But for the present, if an improvement works at reasonable cost then it can be used, whether the explanation is absent or turns out to be incorrect.

It has proved hard to provide definitive answers on the effectiveness of the varied psychological constructs under the heading of aspirations and attitudes (unlike observable behaviours). As shown in Chapters 5 and 6, the association between measurements of concepts like expectations, aspiration, self-esteem or locus of control and educational outcomes tends to disappear when high quality contextual data is available. The strongest claims made for the impact of aspirations and attitudes by authors covered in this review tend to emerge from studies in which measures of prior attainment or SES background or cognitive ability are missing. When these datasets have been re-analysed with fuller contextual data and the association between outcomes and any construct has been shown to be lower than previously understood, or lacking altogether, then the original authors have changed the construct. Self-esteem

becomes global self-concept, and then academic self-concept, and then academic self-concept for a specific curriculum area, and so on.

Some areas covered in this review have sufficient evidence of association and sequence, and what is missing is a series of rigorous tests for efficacy. Individual learners' aspirations and participation in extra-curricular activities are two examples. If suitable interventions can be devised on the basis of the existing correlational work, then the next step should be a programme of randomised controlled trials or similar. Two others areas in a similar position, but for different reasons, are self-concept and self-efficacy. These have both been modelled extensively with no generally accepted results. The key question to resolve here concerns their sequencing in relation to educational outcomes. This will not be achieved using more, or more complex, statistical modelling. Experts in these areas need to come up with testable interventions, and stable definitions with clear, pre-specified success and failure criteria. These must then be independently evaluated to decide whether work in this area is worth pursuing. In the absence of such work, these psychological constructs may be a 'red herring' in the search to reduce the poverty gradient in the UK.

Conversely, individual extrinsic motivation and improving poor behaviour are both areas that already have some examples of successful interventions, even though the other components of their causal models are rather weak. These areas need development, through an iterative design approach perhaps, rather than moving straight to further interventions. There is enough promise to continue work in these areas.

The area with the most complete causal model, and so the most promise for the immediate future, is parental involvement in their children's education. Coupling this with work on parental expectations and parenting style could support and strengthen the approach. There is sufficient evidence to proceed to an engineering phase of development. The key questions are: what is the chief ingredient or lever for success here; and how should the interventions differ when dealing with children of different ages? As with motivation and poor behaviour, a design approach is needed to develop the most cost-effective interventions for policy and/or practice.

For more details, see Chapter 8 of the full report.

1 An introduction to ‘exploring causality’

The project

The aim of this project is to identify and assess available evidence for the causal impact of aspirations, attitudes and behaviours of young people and their parents on educational outcomes such as attainment and post-compulsory participation. This is the most comprehensive review of this area that has been undertaken in the UK to date. However, the resources involved and the breadth of the topic mean that the findings must be read as strongly indicative rather than definitive. A complementary report, also funded by the Joseph Rowntree Foundation, looked at interventions to change attitudes and aspirations (Cummings *et al.*, 2011). The immediate background to both projects was the report for the Joseph Rowntree Foundation by Goodman and Gregg (2010). In line with previous studies, it showed that there is a considerable gap between the average recorded school attainment of children from richer and poorer families in the UK. It also showed reasonably substantive correlations between levels of attainment and pupil and family attitudes to education. A summary of their key findings in each relevant area is used as a preface for Chapters 5 to 7 of this report. This new review of causal evidence is intended to help determine whether such attitudes and aspirations, and the behaviours that stem from them, are a key link between socio-economic background and school outcomes; and, if they are, whether this knowledge can be used efficiently and effectively to reduce the poverty/attainment gap in the UK.

One of the main reasons for providing universal, compulsory and free at point-of-delivery early education in the UK is to reduce the influence of social, familial and economic background on attainment and participation, thus promoting social mobility and a more just and equitable society. There is perhaps no more important issue facing education and society today (Gorard and Smith, 2010). Understanding the reasons for the poverty gap and devising approaches and suggested behavioural changes that help reduce it are therefore directly relevant to current policy and practice. But it would be unethical and inefficient to base real-life approaches on one study or on a clearly incomplete picture of the available evidence. A review of the available evidence and an appropriately sceptical consideration of what it reveals about the causal links involved is a vital next step. This is needed to avoid wasted effort and needless opportunity costs, and to hasten the identification of feasible solutions. There is already considerable policy and practice activity being undertaken on the assumption that aspirations, attitudes and behaviours (AABs) can be influenced to improve educational outcomes. For example, in 2009, the UK government proposed plans to lift the aspirations of 2.4 million children. There is an ongoing emphasis on raising aspirations so that no child is disadvantaged by where they live (St Clair and Benjamin, 2011). This is just one of many national, regional and local initiatives attempting to improve educational outcomes by changing AABs of children and parents. To what extent are proposals like these, and the expenditure they entail, justified by the best available evidence?

The research question for this new review is:

Do AABs cause educational outcomes?

And, if so:

Is there one overall model or different ones for each AAB?

How do child and family background characteristics interact with any effects discovered?

Is it likely that intervening to change AABs will lead to improved outcomes?

And what are the most plausible and/or cost-effective interventions?

The remainder of this chapter briefly considers what is meant by the terms aspirations, attitudes and behaviours, and the kinds of educational outcomes that these might influence. The chapter concludes with a summary of the structure of the rest of the report.

Brief discussion of terms

In a sense this is a report of many reviews – one for each AAB. The range of AABs includes motivation, attitude, aspiration, expectation, self-esteem, self-concept, self-efficacy, locus of control and several others. It includes behaviours such as substance abuse, playing games, work intensity and even religious practices. Moreover, given that it covers both individual learners and their parents, it is clear how wide-ranging this report is. What are these AABs? The complexity of drawing causal relationships between aspirations, attitudes and behaviour and educational attainment is apparent from the outset, because of the different definitions of the terms used in the literature. Many of the concepts, such as self-esteem, attitude and motivation, are interrelated and used in different ways by the researchers reported in this review. Some studies consider only one AAB and some consider several at once. In brief, though, here is a summary of how the review uses each term.

Aspirations and expectations

Aspiration is what an individual hopes will happen in the future. A key indicator might be a child's reported desire to continue with education post-16.

Expectation is what an individual believes will happen in the future. A key indicator might be a parent's report of their child's likely success in a forthcoming test.

There are several different ways of envisaging aspirations. In the Young People's Social Attitudes Survey 2003 (NatCen, 2005), nearly all parents had positive general aspirations for their children, such as 'being happy', but such hopes are not the focus of this review. In some studies, aspiration was taken to mean the intention to stay on in full-time education post-16 or to go on to higher education (Cuthbert and Hatch, 2008; Gorard and Smith, 2010). More generally, it can refer to young people's beliefs about their likely educational attainment (Jacob and Wilder, 2010) or their chances of graduating from high school and going to college (Hill *et al.*, 2004). Aspirations are not necessarily only about good exam results and having a university degree. Several studies used the terms 'aspirations' and 'expectations' interchangeably. This review defines aspirations as what individuals *hope* will happen and expectations as what individuals *think* will happen. Possible indicators include:

- Parents' occupational and educational aspirations for their children
- Parents' educational drive for their children
- Parents' expectations of their child's education

- Young people's intention to stay on in full-time education post-16 or to go on to higher education
- Young people's education/occupational goals
- Young people's beliefs about their likely educational attainment
- Young people's beliefs in their chances of graduating from high school and going on to college

Attitudes and motivation

Motivation is both the reason why an individual makes a decision, and their strength of purpose in carrying these decisions out. A key indicator might be a child's reported belief that schooling is important for their future.

Attitude (other than those 'attitudes' dealt with separately) is an individual's feelings about education. A key indicator might be a child's expression of liking or dislike for school.

The review considers both parent and child attitudes. Attitude can refer to anything that reflects parents' and individuals' feelings about education, schooling and attainment or academic achievement/performance. Attitude is also often taken to mean one's confidence, and so it is linked conceptually to self-esteem and self-efficacy (see below). Some studies measure young people's attitudes only towards certain subjects (Ma and Xu, 2004), and may not include wider attitudinal components, such as confidence and enjoyment, that other authors consider. Mattern and Schau (2002), on the other hand, used a six-item inventory, including a utility component (the relevance or value of the subject), enjoyment and competence in the subject. Other studies refer to pupils' attitudes towards school in general. Motivation can refer to the reasons why parents or individuals make educational decisions, and to the strength of purpose in carrying these decisions out. Possible indicators include:

- Parental value placed upon education
- Appreciation of knowledge
- Attitude to learning or specific subjects
- Young people's attitude towards school (positive or negative), learning and/or education
- Young people's expression of liking or dislike for school
- Belief that school results are important for the future

Self-concept/self-esteem/self-efficacy/locus of control

Self-efficacy is an individual's belief in their own ability to achieve something. A key indicator might be a child's belief about their cognitive abilities in a particular subject area.

Locus of control is an individual's belief that their own actions can make a difference. A key indicator might be a child's belief about the importance of making an effort to ensure success.

Self-concept is an individual's perception of themselves. A key indicator might be a child's perception of the relative economic status of their family.

Self-esteem is an individual's evaluation of their own worth or goodness. A key indicator might be a child's perception of significant others' beliefs, expectations and attitudes about them.

Although many differences are claimed between self-concept, self-esteem, self-efficacy and locus of control, the research on them shares similar approaches, themes and even authors. This

makes the concepts confusing. In some studies no clear distinctions were made between the concepts. Some researchers refer to self-esteem as the evaluative aspect of self-concept and self-concept as the descriptive component of self-perception (Marsh and Craven, 2006; Swann *et al.*, 2007). Shavelson *et al.* (1976) defined self-concept as a person's perception of themselves as a result of their experience, reinforced by evaluations of significant others. Self-concept, in turn, can be considered to influence one's behaviour. Sometimes the concepts were treated as though they were the same constructs because of the close relationships between them. Some studies used the term self-concept to mean both self-esteem and self-efficacy. In others, these terms were used in relation to motivation. Grecas (1989) defined self-efficacy as a belief in one's ability or competence, and that one's own actions can make a difference to the future, while self-esteem is an evaluation of one's worth or goodness. In this case, the latter is viewed as not being directly linked to one's ability, as it could be derived from one's physical attractiveness, personality or moral behaviour. Self-efficacy, in turn, can influence one's aspirations and attitudes towards school. In practice, researchers also used self-esteem and self-concept to measure different things. Even if seemingly similar constructs, such as self-esteem or self-concept were used, the results may differ because authors argue that 'academic self-concept' is not the same as 'global self-concept'. Therefore, findings from different studies may differ, depending on whether the authors were measuring global or academic self-esteem or academic self-concept. For example, in their meta-analysis, Valentine *et al.* (2004) and Valentine and Dubois (2005) found reciprocal effects between academic self-beliefs and achievement, but little or no reciprocal effects between global self-esteem and achievement. Marsh and O'Mara (2008) used the term self-esteem to refer to global self-concept. The varying definitions mean that different studies may be using different measures and are therefore not easily comparable. In discussing studies on the causal influence of AAB, readers need to bear in mind that it is sometimes difficult to extricate the influence of one construct from the other. Possible indicators include:

- Parental locus of control (how far parents believe their own actions can affect their lives)
- Young people's self-esteem, self-efficacy and self-concept (the belief that they can achieve)
- Youth's perception of the economic status of their family
- Young people's perceptions of significant others' beliefs, expectations and attitudes
- Young people's locus of control (how far they believe their own actions can affect their lives)
- Young people's belief in their own ability
- Young people's perception of possible parental support if they choose to continue education post-16
- Peer influence (what individuals believe their friends will do at age 16)
- Friends' college plans
- Individuals' subjective opportunity structure
- Individuals' learner identity and learning trajectory/pathway

Behaviours

Behaviour encompasses a wide range of possibilities, for a child and its parents.

Individual child behaviour includes both risky behaviour such as smoking and potentially improving actions and habits such as physical exercise. Possible indicators include:

- Young people's school attendance and engagement
- Young people talking to friends about choices
- Exclusion, truancy and suspension
- Antisocial behaviour/delinquent behaviour (stealing, fighting, gang culture)
- Substance abuse (alcohol, smoking, drugs)
- Positive behaviour (participation in sport, clubs and activities)
- Emotional problems/hyperactivity
- Peer problems
- Experience of bullying
- Individuals' experience at school

Parental behaviour relevant to the child includes the behaviour of parents/carers, from conception (prenatal health and risk), through preschool (interaction with toddlers) to school (involvement in homework) and beyond. Possible indicators include:

- Parents' own reading and reading to their children
- Parental interest in a children's schooling (e.g. help with schoolwork, subject choice)
- Parental involvement in children's school life (e.g. PTA, children's extra-curricular activities)
- Parental motivational practices (e.g. encouraging children to be persistent in schoolwork)
- Parents' encouragement for college
- Parental social support (closeness, availability for chatting)
- Parents' doubts about affordability of future study
- Parental involvement in highbrow culture (cultural capital)
- Family interactions (e.g. preparation of food with the children, or taking them to the park)
- Childcare (type and incidence)
- Parenting styles/rules (e.g. regular meals and bedtimes)

- Family investment in education of children (books, tuition, computer and internet)
- Parents' choice of school
- Parents' language codes (restricted or elaborated)

Educational outcomes

This review is concerned with whether aspirations, attitudes and behaviour (AABs) can be shown to cause education-relevant outcomes, including attainment and post-school participation.

Attainment is an individual's level of success in educational assessments of any kind. A key indicator might be a young child's school-readiness, such as the ability to read letters of the alphabet and count to ten. Another could be the level of qualifications gained by the end of compulsory schooling.

Attainment can mean performance in standard national tests. It can be qualifications, teacher reports, or formal test scores (including the British Ability Scales). It sometimes refers to achievement or test scores in specific subjects. In preschool studies, achievement could mean school-readiness, with indicators such as the ability to read the alphabet and count to ten. Mattern and Schau (2002) use students' general science knowledge and understanding of science concepts as indicators of science achievement. Miles (2010) uses STAR Math assessment as an indicator of achievement. Wambugu and Changeiywo (2008) use a physics achievement test adapted from the Kenyan national examination past papers. O'Callaghan *et al.* (2007) use learning questionnaires and psychometric tests. This gives just some idea of the range of operationalised definitions encountered. Studies are therefore not always easily comparable.

Participation concerns an individual's educational and work trajectory after the end of compulsory schooling. A key indicator might be a young person's enrolment in further or higher education.

Participation includes what young people do when they have the choice to leave formal schooling, their immediate post-compulsory participation in education, university or college, and their employment and training. Attendance at, or dropout from, compulsory schooling is treated in this review as a behaviour rather than an outcome.

Background factors

Where possible, the review also considers the relevance to educational outcomes of family and other background factors. These include measures of parental socio-economic status (SES), income, parental education, health and well-being issues, ethnicity and special educational needs. Readers should note that this review omits studies that are exclusively concerned with special educational needs or gifted education. Further factors that might be involved in a causal model leading to attainment or participation include: teacher-child relations; school-related factors; peers and the school mix; and incentives (financial or otherwise) from family, government or institutions. However, the most significant potential influences on attainment and participation are an individual's innate ability and their prior attainment (or their 'talent', after Rawls, 1971). Such factors are excluded from the research for this review, but any robust causal model must take account of these.

Structure of this report

The next chapter presents a summary of the methods used to locate relevant published and unpublished evidence for this new review. Chapter 3 presents a series of general criteria for the identification of a robust causal model, which are used to structure much of the rest of the report. Chapter 4 explains how the review findings are summarised and then presented in Chapters 5 to 7.

Chapters 5 to 7 present a summary of the key findings relating each AAB to the two possible educational outcomes. The summary for each AAB uses the same structure, based on the causal criteria set out in Chapter 3.

Chapter 8 presents some recommendations for policy and practice.

The report concludes with a list of the references cited.

Please note that the appendices to this report have been published separately (Gorard *et al.*, 2011) and are available in electronic form by contacting the authors.

2 Conducting the review

Introduction to the review

In consultation with experts, this review generated appropriate search terms for the kinds of indicators described in Chapter 1. The reviewers applied these search terms to the most appropriate electronic databases, generated potentially relevant research reports, excluded some of these, categorised the rest, and added reports from hand searches, recommendations and personal expertise. The reviewers then synthesised all reports, regardless of quality, according to the four causal criteria described in Chapter 3. The quality of any research, as indicated by its report, is used to judge how much weight to place on its evidence. This inclusive approach is based on earlier reviews which have found that the major problem with poor quality research lies in its unwarranted conclusions, rather than with the evidence it presents (Gorard *et al.*, 2007). This is not a traditional systematic review (such as See *et al.*, 2011). Therefore, this new review largely ignores the conclusions of the researchers themselves, and instead uses their evidence, of whatever scale and quality, for the eventual synthesis.

Sources searched

Electronic searches were conducted, using the search terms below, of the main educational, sociological and psychological databases. These were ASSIA, Australian Education Index, British Educational Index, ERIC, PsycInfo, Research papers in Economics (RePEc), Social Services Abstracts and Sociological Abstracts.

These were supplemented by advertising for relevant research reports, advice from the project advisory group, communication with the AAB interventions review team at the University of Newcastle (Cummings *et al.* 2011), hand-searching of recent journal articles and the existing knowledge of the reviewers. The search did not include wholesale daisy-chain searching from one research report to all of its references.

Search criteria

Following a substantial scoping review to test the sensitivity of the search terms, a standard and highly inclusive statement of search terms was used for each database (adjusted to suit the idiosyncrasies of each). This statement of search terms was tested, adjusted and re-tested iteratively to ensure that as much relevant material as possible was captured. In summary, the search was for any material, published or unpublished, that mentioned attainment at school (or a synonym) or educational participation after school age (or a synonym), plus any of the AAB or socio-economic status (SES) background terms (by name or a synonym), plus any causal term (or a synonym) or any research design (such as regression discontinuity) that would be appropriate for testing a causal model. A key purpose of the search was, wherever possible, to gather grey, unpublished literature in order to reduce the possibility of publication bias.

The full search 'syntax' of the terms used in the search and the logical operators (and, or, not) that were used to connect them is reproduced here for replication and other purposes.

The syntax used for searching the ASSIA, AEI, BEI, ERIC, Sociological Abstracts, and Social Services Abstracts databases was:

(attainment OR test score OR school outcome OR qualification OR exam* OR proficiency OR achiev* OR "British Ability Scales" OR "Key Stage" OR NEET OR "sixth form" OR college OR post-16 OR "post-compulsory" OR "postcompulsory") AND (attitud* OR expectation* OR aspiration* OR behaviour* OR intention* OR motivation OR self-efficacy OR locus of control OR "family background" OR "home background" OR SES OR "socio-economic status" OR "socioeconomic status" OR poverty OR disadvantage OR "low income" OR deprivation) AND (child* OR school) AND (caus* OR effect* OR determinant* OR "regression discontinuity" OR "instrumental variables" OR experiment* OR longitudinal OR randomi?ed control* OR controlled trial* OR cohort stud* OR meta-analysis OR "systematic review")*

This yielded 133,641 candidate research reports. The syntax for searches using the PsycInfo database was the same, but did not support the use of '*' as a wild-card term. This yielded 1,677 candidate research reports. The syntax for searches using the RePEc database also did not support the use of '*' as a wild-card term, and involved substituting '/' for OR and '+' for AND. This yielded 31,173 candidate research reports.

In total, 166,491 research reports were identified as possibly relevant. These were copied to an Endnote database. The search was completed by the end of January 2011, which, therefore, marks the latest date for full material to be included.

Cleaning the dataset

Since 166,491 is such a large number of reports, the initial screening and cleaning of the database involved only the titles of pieces. Duplicate reports were removed. In general, and to allow progress with the resources available, reports pre-dating 2000 were largely ignored on the assumption that important prior work would be referenced in subsequent reports from 2000 onwards. By agreement with the funder, work that was exclusively concerned with children with special needs or with adult and professional learning beyond the age of 21 was also omitted. Only reports in English were retained. This led to a considerable reduction in the number of possibly relevant pieces to 3,651, but it does also mean that, in addition to any evidence missed by the initial search, a few key reports might have been deleted from the database on title alone.

The next stage involved reading the abstracts, and a further series of reports were excluded on this basis. Reports were deleted where their abstract made clear that they were in any category listed above (e.g. duplicating the same evidence, or concerned with older adults), where lack of relevance to the review became apparent (such as having the AAB solely as the outcome), or where they were not based on research. The review also excluded reports of instructional/teaching strategies, or generic school improvement studies, where such studies did not use AABs as an intervening stage. To be relevant to the review, a report had to link AABs to educational outcomes. Therefore, interventions to improve learning via better teaching strategies, or to enhance motivation without considering the impact on educational outcomes, for example, were ignored. These successive steps reduced the database to 1,827 reports (but now including some hand-searched and already-known pieces). This version of the Endnote database is available for other researchers upon request.

The final stage involved reading the full reports. Again, reports were deleted from further consideration where it was now clear that they were in any of the excluded categories listed above, or where the quality of reporting was so poor or deficient in detail that the research itself was impossible to judge. The remaining studies are used somewhere in the ensuing narrative synthesis.

The next chapter specifies the criteria deemed essential for a robust causal model in social science. These criteria were used to classify the remaining full reports of relevant studies.

3 The nature of causality

In their 2010 report, Goodman and Gregg largely presented their results as associations between variables, because of the nature of the datasets they used and because no interventions were involved. Do aspirations, attitudes and behaviours (AABs) cause the educational outcomes with which they are associated? Or does attainment at school lead to positive AABs? Or is there some third factor that produces both AABs and educational outcomes? To answer these questions, this new review is based on a simple set of general criteria for establishing a robust causal model.

According to John Stuart Mill (1882), a causal claim can be made if:

- the cause preceded the effect;
- the cause and the effect are related, and
- there are no plausible alternative explanation for the effect other than the cause.

These are all important elements, but Mill's criteria do not make clear what 'related' means. Bradford Hill (1966) and others working on the links between smoking and lung cancer proposed another set of scientific conditions for workable and ethical identification of a causal link. Put simply, we can talk of a cause-effect relationship between X and Y when most of the following descriptions apply (Gorard and Cook, 2007):

- X and Y are associated in different studies, with different researchers, using different methods and differing populations.
- The frequency of association is substantial compared with the frequency of X or Y in isolation.
- There is exposure to, or experience of, X before the onset of Y in all cases.
- X can be used to predict the onset of Y.
- There is a reduction in Y after the removal of X.
- There is an increase in Y after intervention X to increase Y.
- And there is a coherent, plausible, workable agreed mechanism for X to influence Y that is consistent with prior knowledge.

These include and clarify two of Mill's criteria, and add a requirement for a plausible and agreed explanation of the causal model. However, they omit a crucial element of Mill's ideas, which is the elimination of sensible alternative explanations. Subsequent writers have created their own formulations with many of these same elements for social science research (e.g. Byrne, 1984, 1986). In a series of more recent publications, Gorard (2002a, 2002b, 2004a) has proposed a model of causal evidence for social science that consists of four main criteria, clarifying and extending the ideas of Mill and Bradford Hill.

- 1 For X (a possible cause) and Y (a possible effect) to be in a causal relationship, they must be repeatedly associated. This **association** must be strong and clearly observable. It must be replicable, and it must be specific to X and Y.
- 2 For X (a possible cause) and Y (a possible effect) to be in a causal relationship, they must proceed in **sequence**. X must always precede Y (where both appear), and the appearance of Y must be safely predictable from the appearance of X.
- 3 For X (a possible cause) and Y (a possible effect) to be in a causal relationship, it must have been demonstrated repeatedly that an **intervention** to change the strength or appearance of X strongly and clearly changes the strength or appearance of Y.
- 4 For X (a possible cause) and Y (a possible effect) to be in a causal relationship, there must be a coherent **mechanism** to explain the causal link. This mechanism must be the simplest available without which the evidence cannot be explained. Put another way, if the proposed mechanism were not true then there must be no simpler or equally simple way of explaining the evidence for it. This 'warrant' principle (Gorard 2002b) combines the final complementary but different criteria of Mill and Bradford Hill.

If each criterion is seen as necessary (though not individually sufficient) for a causal model, then any study including evidence relevant to at least one of these criteria can contribute to the search for causal mechanisms, through the falsification principle. A cross-sectional study that finds no association between X and Y reduces the likelihood that there is a causal mechanism from X to Y, and so on. The purpose of this new review is to consider the existing evidence in light of causal descriptors like these, to see whether and to what extent the associations already uncovered are causally linked, and to propose ethical and feasible future work to test any reasonable evidence of causal links.

The next chapter explains how these criteria are used to classify the key findings, which are then presented in Chapters 5 to 7.

4 The organisation of the key findings

The six elements of each case study

The full and relevant studies, found as a result of the search described in Chapter 2, were read and judged by the reviewers to be a contribution to evidence concerning the effects of one or more of the aspirations, attitudes and behaviours (AABs) described in Chapter 1.

The studies relevant to each AAB were grouped together. They were then further sub-grouped in terms of their contribution to: establishing an association between that AAB and an educational outcome; establishing a sequence from that AAB to an educational outcome; establishing that an intervention to change that AAB would lead to an improved educational outcome; or providing a mechanism to explain the causal model. This grouping then forms the basis for the key findings presented in Chapters 5 to 7. The main review evidence is described in a separate section for each AAB, with six sub-sections for each, consisting of:

- 1 An introduction – summarising the evidence (if any) from the Goodman and Gregg (2010) review.
- 2 An outline of any cross-sectional, or uncontrolled intervention, studies looking at the **association** between an AAB and an educational outcome.
- 3 An outline of any longitudinal studies looking at the temporal **sequence** of variation in an AAB and an educational outcome.
- 4 An outline of any controlled **intervention** studies looking at the impact of variation in an AAB on an educational outcome.
- 5 A discussion of at least one plausible **mechanism** to explain the evidence of impact where there is any evidence of impact.
- 6 A **conclusion**, summarising the whole story for each AAB, and suggesting a way forward.

In each section of the key findings, evidence concerning each AAB is presented as far as possible in ascending order of the age of the learner at the end of that study. Where no results are presented for an attitude or behaviour, it is because no relevant evidence was found in the search.

Chapter 5 discusses aspirations, attitudes and behaviours of parents. Chapter 6 discusses aspirations and attitudes of children. Chapter 7 contains research on the behaviours of children.

Caveats – a reminder

This is a very wide-ranging review of evidence. Despite searching eight major electronic databases, supplemented by other sources, and then selecting relevant evidence from over 160,000 hits, there is always a danger that something important has been missed. For example, no specifically medical databases were searched. This means that when the review concludes, as it does, that the review

found little evidence of damage leading from prenatal substance abuse by parents to lowered educational outcomes for their children, it means just that. The review, conducted as described in Chapters 1 to 4, found little evidence on this topic. And of this total, the review found even less evidence of any dangers for educational outcomes only. This does not mean that other evidence does not exist, nor that prenatal substance abuse does not have other dangers.

In some respects, the necessary focus of the search on causal claims (and the syntax used in the search – see Chapter 2) means that a substantial number of cross-sectional studies of association may have been missed. These studies will have been more likely to be missed if they described their findings accurately as associative and not necessarily causal. This then means that the full body of evidence on simple associations may be under-represented in Chapters 5 to 7. This has been taken into account in the analysis and discussion. However, it is not a major problem, as the large number of longitudinal studies also provides evidence of associations, and this report starts each section with a consideration of the relevant associative evidence presented previously in Goodman and Gregg (2010).

Resource constraints also meant that the review focused on work that was electronically available, reported in the English language between January 2000 and January 2011, not exclusively about SEN pupils, and not deemed too culturally specific, where the work was done outside the UK. Occasionally, the electronic databases are inaccurate in detail (such as the spelling of authors' names) or even in citation. In addition, all of the classifications used here reflect the judgements of the reviewers, and there will inevitably be a few omissions or mis-classifications of some kind in an undertaking of this scale.

Therefore, and for all of these reasons, both despite and because of the scale of the search and its yield, this review must still be regarded as indicative rather than definitive. Nevertheless, this is the largest existing review for the UK, looking at the evidence for a causal model linking aspirations, attitudes and behaviours to school attainment and subsequent educational participation. The key point is not whether any studies have been missed in the search and exclusion activities of this review (since they almost certainly have been), but whether any new study would alter the substantive findings represented in Chapter 8 and the Executive Summary. For example, the search yielded several similar studies of the self-concept by one group of authors, whose work is well-represented in this review. Adding extra or earlier pieces by these same authors would not, in all probability, alter the judgements made.

Where no evidence is presented – for parental locus of control, or the impact of truancy on attainment, for example – this is because none was found that explicitly linked this attitude to educational outcomes. For some topics, such as the UK AimHigher programme of interventions to encourage participation in higher education, this absence of evidence was rather surprising. But perhaps it really is the case that (almost) no correlational, longitudinal, or experimental work has been conducted that compares the eventual educational outcomes of those exposed to AimHigher with others. None was reported in an earlier review specifically concerned with HE participation (Gorard *et al.* 2007). Another area that yielded almost no results was small-scale school-based interventions by teachers. This could be because these are not reported anywhere, or because they did not explicitly involve any AABs, or the AABs – rather than attainment or participation – were the desired outcome.

In general, there was no consistent reporting of effect sizes in the studies reviewed here. Most authors relied on significance testing alone, with all of the problems and limitations that implies. Effect sizes are repeated in the review where available, but no two sets of effect sizes occurred for the same intervention across different studies, and so no meta-analysis is possible. Without more consistent use of effect sizes, it is also not possible to conduct a cost-benefit analysis of interventions in each area.

Note that this review reports methods and evidence, where available, from primary research reports. It may also describe the primary authors' conclusions. However, the grouping into sections, the commentary on the evidence, and the use to which the evidence is put in this report, are all the responsibility of the authors of this review.

The next three chapters summarise the evidence on each major indicator of aspirations, attitudes and behaviours.

5 Parental aspirations, attitudes and behaviours

This chapter outlines the review evidence relevant dialogic to the effect of parental aspirations, attitudes and behaviours (AABs) on educational outcomes. It has four sections, on parental expectations, parents' involvement in their child's education, prenatal substance abuse, and parenting styles. These were the only areas relevant to parents found by the search. Only parental involvement has evidence for a full causal model. It is noticeable that in several studies, the focus is on the mother as parent or carer but that, where evidence on the role of fathers exists, it shows that the involvement of the father can be an important factor.

Parental expectations

This section looks at parental expectations (what they think their child will achieve) and aspirations (what they hope their child will achieve) together, largely because this new review discovered no studies specifically about parental aspirations (but see separate section on individual aspirations in Chapter 6).

Goodman and Gregg (2010) reported that parental expectations have a role to play in their child's attainment. Parental expectations are stratified to some extent by poverty, but the researchers also found that expectations are high across the board, for higher education and when aged 14 – indeed, currently there are not enough university places in the UK to satisfy such a level of demand. This suggests that it is not low expectations that are generally to blame for the stratified intakes to higher education. Something else happens so that some children with high expectations succeed and some do not. Expectations themselves are therefore unlikely to be a determinant of participation. Goodman and Gregg also pointed out that parental expectations are linked to parental involvement (dealt with in a separate section), and to the child's cognitive ability and attainment. But the latter link could simply mean that, in general, parents calibrate their expectations according to the ability and prior achievement of their children (see also section on individual expectations in Chapter 6). Nevertheless the report makes some strong claims, saying, for example that only 37% of the poorest mothers hope their 9-year-old child will go to university. The authors suggest that such 'adverse attitudes to education of disadvantaged mothers are one of the single most important factors associated with lower educational attainment at age 11' and that 'this factor alone is associated with 6% of the attainment total gap between the richest and poorest children at age 11, even after accounting for differences in prior ability'. Here we examine the wider evidence for this claim.

Association

Goodman and Gregg's review (2010) found a number of studies that showed a positive link between parental expectations and a child's school outcomes (Carroll, 2000; Senler and Sungur, 2009). Children seem to perform better at school when their mothers expect them to (Mistry *et al.*, 2009). Hong and Ho (2005) used US National Education Longitudinal Survey (NELS) data, and found a strong association between parental aspiration/expectation and student achievement.

Grinstein-Weiss *et al.* (2009) used a sample of over 12,000 children aged 5 to 17, from three different datasets. Their study found that self-reported parental expectations for their children were associated

with pupil outcomes at school. But parental behaviour and parent-child interaction, as they reported it themselves, was not associated with pupil outcomes. Jeynes (2007), in a review of studies, also finds a stronger link between school grades and parental expectations (0.9 'effect' size) than parenting behaviour (0.4). Fan and Chen (2001) similarly reviewed a number of studies and reported a stronger association between parental expectation and achievement than between parental involvement and achievement. Qi (2006) agrees for children specifically in black families. However, like many of the studies in this review, none of these included parental socio-economic status (SES) or pupil prior attainment in their analyses.

Cook (2010) involved 77 care-givers (primarily mothers) enrolled in the US government's Head Start programme aimed at low-income families with children, to look at the relationship between parent expectations, parent involvement in home learning, enrichment activities, and the school-readiness of very young children. Standardised measures were administered to children to assess school-readiness, and to parents to measure behaviour and expectations. High parental expectations were strongly linked to school-readiness scores, and also to parental involvement in learning, but parental involvement was not, apparently, the explanation for the link between expectations and school-readiness.

Therefore, there is enough simple evidence to suggest that parental expectations could be linked to their children's school outcomes of different kinds and at different stages.

Sequence of events

Similarly, this new review (Goodman and Gregg, 2010) found a number of reports relating to parental expectations for their child's education, and the subsequent attainment or participation of the child (Crosnoe *et al.*, 2002; Joussemet *et al.*, 2005; Sy and Schulenberg, 2005; Strom and Boster, 2007; Kiernan and Huerta, 2008; Rogers *et al.*, 2009; See, 2009; Johnson *et al.*, 2010).

Taningco and Pachon (2008) included fifth-grade US students, and their data came from the US Early Childhood Longitudinal Study (ECLS). The focus was on Hispanic/Latino students, computer use and mothers' expectations of their children to finish college. Although the ECLS data included 11,000 children, the study only analysed data for a smaller number where data for independent and explanatory variables were available. However, the authors did not report the actual number used in the analysis. For the ECLS, academic achievement is measured by the Academic Rating Scale, based on teacher ratings of students' achievement in maths, science, reading and writing. Teachers also rated students' skill, knowledge and behaviours. Background data, included parental expectations, race/ethnicity, language spoken at home, mother's education and poverty level. The authors found mother's education and parental expectations to be consistently and positively associated with test scores.

On the other hand, Englund *et al.* (2004) found no association between parents' expectations and child school performance in first and third grades, or between mother's instruction and school performance. Skokut (2010) found that only SES was linked to school completion and only individual learner expectations were linked to post-secondary school attendance for Latino English-language learners in California. Parent expectations, parent-child communication, school-connectedness and extra-curricular activities made no difference to either outcome. It may therefore be that the individual's expectations are most important, regardless of from where they derive. Gill and Reynolds (1999) suggested that a child's perceptions of parental expectations may have an effect on their achievement, independently of actual parents' expectations.

Therefore, the evidence of Goodman and Gregg's review (2010) is unclear. Even though there are several studies looking at simple associations between parental expectations and outcomes, these do not look at the order in which these two things occur. The link between parental expectations and child success is less stable when viewed in the proper sequence for a causal model.

Intervention

Goodman and Gregg found no controlled interventions explicitly intended to alter parental expectations in order to assess the influence on child's school outcomes.

Mechanism

There are several mechanisms through which parents' expectations might conceivably affect children's attainment. First, these expectations might affect the resources (time and money) parents devote to supporting their child's education. Second, parents' expectations might frame their children's expectations as discussed in Chapter 6. Third, parents' expectations may direct the way in which they respond to opportunities and problems their children encounter in school. A credible causal model of parents' expectations affecting children's attainment would need to provide evidence that one of these mechanisms (or another) was active in mediating the effect of parents' expectations.

Conclusion

The review found almost no evidence relevant to parental aspirations and school outcomes. The evidence on parental expectations suggests that they are linked to a child's success at school and beyond. But the sequence is not clear for a causal model, and no evidence has been presented that changing parental expectations influences their children's school outcomes. At present, the evidence in this review suggests that anyone with a sole concern to improve educational outcomes for those most at risk of underperformance should seek an intervention elsewhere.

Parental involvement and education

Although parental involvement in their child's education (such as homework help, discussion of reports and choices and attendance at parents' evenings) is covered by their datasets, Goodman and Gregg (2010) did not present any explicit evidence linking this topic to the child's subsequent attainment. However, they implied an association by saying: 'Young people from rich and poor families not only differ in how well they perform in exams, they also show marked differences in many family background characteristics (including parental education, family size and ethnicity), and their attitudes and behaviours (and those of their parents) in the teenage years, which may help to explain the large gaps in attainment.' (p. 35). The area of parental involvement more generally yielded the most studies for this new review. In their own review relevant to this topic, Desforges and Abouchar (2003) claimed that parental involvement has an effect on children's achievement and adjustment, even after all other available explanatory factors have been accounted for.

Association

This new review found several studies showing a medium association between some measure of parental behaviour, and the school-readiness or performance of their child (Yan and Lin, 2005). This included encouragement for parents to read at home with their young children, and help for some parents in providing reading activities (Brooks *et al.*, 1997; Siraj-Blatchford, 2010).

Positive associations have been reported between two kinds of early parenting and 'school-readiness'. One set of studies examined early reading and communication. For example, using observational data on mothers' reading with their children, Korat (2009) reported positive associations between mother's education and the sophistication of their interaction with their child's reading, which was also associated with the child's reading level. Other studies attempted to categorise parenting into different

styles. For example, Morrison *et al.* (2003), using a sample of 142 families, reported a positive association between the observed quality of mother-child interaction in problem solving, and the child's contextualised school performance. Cooper *et al.* (2010) used the ECLS-Kindergarten Cohort (ECLS-K) of 20,356 children and measured parental involvement through the Home Observation for the Measurement of the Environment (HOME) Scale. This scale measures the availability of resources for learning (such as books) in the home and the frequency of the child's participation in learning activities within and beyond the home. The authors reported that these measures of parental involvement mediate the association between family poverty and children's maths and reading achievement in kindergarten.

Similar, positive associations are also reported for parental behaviour that is seen as supporting children's achievement during their schooling. For example, Feinstein and Symons (1999) found that early parental interest in their child's education was strongly associated with school progress. However, this evidence is somewhat problematic in that it relies solely on teachers' reports of the level of parental interest. Martin and Martin (2007) described the Williamson Project, which involved parents, community leaders and school personnel in a comprehensive effort to improve achievement for African-American students at one urban elementary school. The results indicated improvement in academic achievement in state-mandated achievement testing and a decrease in behavioural problems. One suggestion emerging from this study is that school environments should be restructured to resemble more closely the family environments and cultures of all children. A problem with this study is that the multi-faceted 'comprehensive' effort at improvement means that the results for parental involvement specifically are hard to interpret. Topor *et al.* (2010) used a sample of 158 7-year-olds, as well as their mothers and teachers, to investigate the mechanism that explains the relationship between parental involvement and children's academic achievement, such as child's perception of their own cognitive competence, and the quality of the pupil-teacher relationship. There was a correlation between parental involvement and child's academic performance over and above the impact of cognitive ability. (See also: Abd-El-Fattah, 2006; Aikens and Barbarin, 2008; Baldwin *et al.*, 1989; Bleeker and Jacobs, 2004; Bodovski, 2010; Campbell, 2007; Davis-Kean *et al.*, 2003; de Graaf *et al.*, 2000; Lee and Bowen, 2006; Morrow and Young, 1997; Rosenzweig, 2000; Zhai *et al.*, 2011).

Therefore, there is some basis for a causal model here, especially in relation to the quality of mother-child interaction (see the caveat in Chapter 4 about the possible under-representation of associational studies).

Sequence of events

A considerable number of longitudinal studies suggested that parental involvement and interest in their child's learning from an early age and through their schooling were related to successful outcomes, and in the correct sequence for a causal model (Son and Strasser, 2002; Sylva *et al.*, 2004; Sylva *et al.*, 2008). This is by some way the largest category of reports in the review. And perhaps most importantly, and uniquely for the studies of all behaviours in this review, no studies reported the absence of such a link. The studies are presented in three groups: those that investigated parental behaviour towards preschool children; those that traversed the preschool/school boundary; and those that focused on school-age children.

Preschool

Johnson *et al.* (2007) used a set of adopted children, collecting parenting information and expectations from parents and children. The association between SES and outcomes was mostly explicable by prior IQ measures for the child. Around 13% of the remaining variation was associated with differences in parental involvement. Similarly, Dearing *et al.* (2009) with a longitudinal sample of 1,398 families, found that higher levels of participation by parents in early childcare were followed by a weakened link between social class and subsequent educational achievement. Evangelou *et al.* (2007) conducted a longitudinal evaluation of the Peers' Early Education Partnership, a UK-based initiative that involved children and parents in areas considered to be at risk of underachievement. The intervention group had subsequent higher scores

for language learning. Kiernan and Mensah (2011) analysed data from the UK Millennium Cohort Study, and reported that the parenting index score for positive parenting was linked to the child's foundation stage achievement, regardless of poverty or other disadvantage.

Dearing *et al.* (2006) tracked a sample of 329 kindergarten children, and found an association between children's literacy improvement and parental involvement at school. This link was stronger if the mother herself had a lower level of education. Mistry *et al.* (2008) used 1,500 children from low-income families, and found an association between support for language development (e.g. through reading) and 'maternal supportiveness' in problem-solving activities from the age of 14 months and the child's performance on developmental and behaviour scales when aged 42 months.

Across the preschool/school boundary

Crosnoe *et al.* (2010) took participants from ten locations across the US. A total of 1,364 mothers aged 18 or older and conversant in English, and whose baby was a single child, were enrolled for the Study of Early Child Care Youth Development. By the fifth grade, 287 families had dropped out or were lost. To avoid bias because of the missing data, the authors used full information estimation methods to allow for retention of all observed data. This approach has both benefits and some dangers. At 54 months and in grades one, three and five, learning was assessed using two Woodcock-Johnson Psycho-Educational Battery-Revised subtests. Reading skills were assessed using Letter-Word Identification, while maths skill was gauged using Applied Problems. Family SES was based on parents' self-report of parent education, income and marital status, and on the child's neighbourhood. Cognitive stimulation in the home at 54 months was measured using the HOME scale. Cognitive stimulation in childcare at 54 months was based on the Observational Rating of the Care Environment. Cognitive stimulation in the first-grade classroom was based on the Classroom Observation System. Control variables such as sex, race, mother's employment and school-readiness (based on the Basic Concept Scale), were included as dummy variables.

According to the study, children from high-SES backgrounds had more exposure to stimulating environments of the kind that might enhance learning. Children identified as having been exposed to cognitive stimulation at home and in preschool childcare and first-grade classrooms, net of socio-economic selection into different settings, had higher subsequent maths and reading achievement. The observed benefits of consistent environmental stimulation across settings tended to be more pronounced for low-income children. The authors argued that policies targeting only one setting might not be as effective as those interventions that target multiple settings in improving outcomes for children at risk of underperformance. Some potential confounding variables, like parenting skills and types of schools or childcare centres, were not included in the analysis. The link between SES and quality of childcare was also omitted, as was the potential influence of pre-existing differences in IQ.

Burt and Roisman (2010) used 1,364 randomly selected 15-month-old toddlers and followed them through to the age of 15. The researchers collected measures on standardised scales of social competence, family income, school engagement and achievement. The mothers' response to and interaction with their very young children predicted greater social competence, school engagement and then achievement. However, it was unclear from the report how much background and context variation was accounted for in the analysis.

Hango (2007) suggested that greater parental involvement can mediate the negative effects of low SES. The author used data from the UK National Child Development Study (NCDS), which is a longitudinal study of children born in one week in 1958. An initial 17,000 mothers were interviewed (98% of all births in that week in 1958). Follow-up interviews were conducted with the children when they were aged 7, 11, 16, 23, 33 and 43. However, the final sample was reduced to 3,072, taking into account missing and other data for age 7 financial hardship and age 11 parental involvement. This was further reduced to 2,658 considering age 11 financial hardship and age 16 parental involvement. This was because the researchers decided to include only children who were born into two-parent homes, and whose parents did not divorce or separate before age 16 (in order to avoid biased reports from single parents because of marital disputes).

Childhood financial hardship was measured at age 7 based on health visitors' reports, and at age 11 based on parents' self-report on whether they were facing 'financial difficulty'. At age 11, parental involvement was based on teacher reports of parents' interest in education, and on the parents' self-reports of items like how often they go on outings with their child. Parental involvement at age 16 was based on teacher report, and on asking young people if they got on well with their parents. The analysis also included parents' age when their child was born, when they themselves left school, the fathers' social class, house ownership, household structure, residential mobility, the child's sex, behaviour (anxiety and aggression) and reading ability based at age 7 and 11 on teacher ratings, and at age 16 on a reading comprehension test.

The child's educational attainment, in terms of whether the child had any qualifications or not by age 33, varied substantially by parental involvement (Hango 2007). Two factors – fathers' interest and going on outings with the mother at any age – were associated with the largest decrease in the chance of a child having no qualifications. It would appear that the best predictors of education attainment are father's social class, living in owner-occupied homes and the child's sex, behaviour and reading ability. The authors claim that fathers' interest in school had the biggest impact on reducing the effect of economic hardship. However, individual attributes like behaviour, sex and reading ability as well as family background continue to matter. The outcome measure here is an odd one, since the authors could have used qualifications achieved and actual educational trajectory at age 16 as well. Several key indicators are based on self- and subjective reports, despite the existence of other more objective measures in the dataset.

At school

Bates (2009) used data from four waves of the ECLS-K of 1998–1999, looking at school and family processes and the educational trajectories of children from kindergarten through to US fifth grade. There were three measures of parental home involvement: educational expectations, frequency of reading outside of school and number of children's books in the home. The research found ethnic differences in the level of parental involvement, but these are greatly reduced once other family and school characteristics are accounted for. Parental involvement was positively associated with children's reading and maths scores in kindergarten and with the change in those scores over time.

Gfellner *et al.* (2008) evaluated the Parent-Child Home Program in Manitoba, Canada, (formerly known as the Mother-Child Home Program, developed by Levenstein, 1979), for the 20 years since the programme was introduced. The aim of the intervention was to reduce negative school outcomes for disadvantaged children. The programme used the parent-child bond to facilitate verbal interactions between parents and preschool children with an emphasis on toys and books introduced into the home. Home visitors and volunteers or paid service providers demonstrated to parents the styles of play and reading that facilitate verbalisations. Of the 185 families enrolled in the initiative, data were available for only 86 cases because of missing forms or dropouts. The quality of home environment (including mother and child behaviour during home-visitor sessions) was assessed on the 30-item Home Session Behaviour Scale. The instrument Child Behaviour Traits was used to assess the frequency with which the child exhibited specific behavioural characteristics. Quality of interaction was measured using the Parent-Child Together inventory. Performance outcomes were measured using three standardised instruments (Levenstein, 1988). Baseline measures were taken at three points (six weeks after introduction of the programme, at the end of the first year and at the end of the second year, on completion of the programme). Only children with all three measures were included in the analyses. The authors reported an improvement in the quality of home environment, parent-child interaction and child behaviour conducive to learning. However, there was no report of any control, or randomisation, and there was over 50% dropout. Many of the outcomes were judged by the visitors, who may have had an interest in the success of the intervention.

Schvaneveldt (2000) examined parental involvement in their children's academic activities and parental regulation of adolescents' behaviours in eighth grade, and the possible effects of these on academic achievement in tenth grade. Data were drawn from the US NELS survey, which included 13,116 participants. Participants were compared by sex, ethnicity and SES. The study claimed strong evidence

that for all sex, ethnicity and SES groups, post-secondary educational attainment can be enhanced through greater parental discussion of academic activities with their child during early adolescence. Greater parental discussion was positively associated with greater academic achievement during middle adolescence, which was then linked to greater post-secondary attainment. This was true for all groups, but particularly so for (East) Asian or Caucasian and higher-SES children.

Flouri and Buchanan (2004) used the UK NCDS 1958 data, with four indicators of parental behaviour as reported by parents when the child was aged seven: reading with the child; taking outings with the child; being interested in the child's education; and 'father manages the child'. The research showed an association between reports of father's involvement in their child's education at age 7 and school outcomes age 16. Flouri (2006) used the UK British Cohort Study (BCS) 1970 data, and reported a strong association between parental interest in their child's education aged 10, and educational outcomes at age 26 when controlling for other factors. The 'parental interest' item was completed by teachers, which is not ideal.

Stewart (2006) used data from NELS 1988 to look at the link between parental education, income and involvement, individual motivation, extra-curricular involvement and school engagement, and the academic achievement of African-American students in the eighth, tenth and twelfth grades. After prior attainment was accounted for, parent or care-giver school involvement was related to twelfth-grade achievement.

Orthner *et al.* (2009) analysed data from the NLSY97, a US nationally representative sample of adolescents followed into adulthood. This study was built on bio-ecological and social capital theories of human development suggesting that the capacity for child and youth development is enhanced when their primary relationships are supportive and provide them with social assets that encourage human capital development. The findings indicated that family stability and living with two biological parents is a stronger predictor of high school graduation than the quality of the parent-child relationship. But the data also indicate that the quality of the parent-child relationship can have a strong and positive influence on post-secondary education access among those who graduated from high school.

It is clear that despite some doubts about the quality and rigour of some of these studies, there is considerable summary evidence that parental interest and involvement in their child's education is associated with, and appears in the correct sequence to cause, educational and occupational outcomes. This is true from preschool to post-16 participation.

Interventions

Zevenbergen *et al.* (2003) evaluated the impact of a shared reading intervention programme on the reading skills of 4-year-old children from low-SES families enrolled in Head Start. However, because the intervention was conducted in the classroom as well as at home, it is hard to untangle the outcomes. Ten further intervention studies were found on parental involvement. These are presented in two groups: preschool interventions and interventions during schooling. Two small studies suggest that changing parental involvement via an intervention has no discernible effect on attainment or participation for the child. One of these was of generally high quality. The other studies all claim that the intervention is at least partly successful.

Preschool

Ford *et al.* (2003) evaluated an initiative in Wales called the Tandem Project, to encourage parents from low-SES backgrounds to play a greater role in preparing their children for school, as part of the Sure Start initiative. The intervention lasted six weeks, and parents were given a series of games to play with their children, designed to develop basic pre-reading and numerical skills. A total of 128 children took part (only 10% of those invited), aged from 33 months to 46 months, from socially and economically deprived backgrounds. Of these, 63 lived in the designated Sure Start area, and were less likely to have families with earned income, and more likely to have single mothers, and mothers who had left school before the age of 16, than the other

65 children. The children were divided into four roughly equal groups, including Sure Start delivered by parents, other parents as a control, children with Sure Start delivered at nursery, and other nursery children as a control. Children were assessed on each of the skills (such as recognising letters or numerals) before and after the intervention and again six weeks after the intervention. The results were mixed. In general, the treatment groups made greater gains than the controls in some tasks or skills. The nature of these gains differed in the different treatment groups, and also differed in the same group in the post-test and after six weeks. The amount of parental effort in support of the intervention was largely unrelated to the eventual reading results. The cell sizes are small and the gains are measured over a very short term.

Levenstein *et al.* (1998) investigated the long-term effect of a home-based cognitive intervention to promote parent-toddler verbal interaction, called the US Parent-Child Home Program, on high school performance, 16 to 20 years later. Stimulation was provided by toys and Verbal Stimulation Materials. Toddlers were considered to have completed the two-year programme if they received at least 35 of the 46 materials available. Children were eligible if they met five at-risk criteria, such as having a single parent, an unemployed mother, their family received Aid to Families with Dependent Children (AFDC) payments, their family income qualified for poverty payments, parental education was lower than twelfth grade, an older sibling in a Chapter One remedial programme, or the child's IQ score was under 100 (based on the Peabody Picture Vocabulary Test). Originally, there were 188 children in the treatment group, in different years from 1976 to 1980, and 31 were randomly assigned to the control group only in years 1979 and 1980. The data were collected retrospectively from programme records and from the Pittsfield office's school records. The authors analysed the results in terms of which group participants were allocated to initially, and not in terms of whether they actually completed the treatment. This approach was adopted to overcome the problem that particular kinds of children might be more likely to drop out of the study; it is referred to throughout this review as analysis by 'intention to treat'. At age 19 and beyond, 77% of children who had been offered the programme then graduated from high school, compared to 54% of the control, and 84% overall for middle-SES students in the same age cohorts in Pittsfield city. The results are complicated by having such a small control (to benefit as many children as possible), by 31 cases in the treatment group withdrawing from the study before age 16, and the fact that after 16 or more years, 41% of cases were no longer in the study. Demographic and scholastic baseline data were not available from the schools, as these had not been archived. It was reported that the control group had slightly lower IQ scores than the treatment group at the outset. Those who completed the programme had higher IQ scores. And those who took part in the programme were volunteers, meaning that parental motivation and IQ may be confounding factors in the years that follow the treatment.

Reynolds *et al.* (2004) used 1,404 children from low-income families taking part in the Chicago Longitudinal Study of the Chicago Child-Parent Centers (CPCs), aimed at improving educational attainment and reducing delinquency. The original sample included those who entered the CPC preschool and completed kindergarten, and those who participated in government-funded kindergarten programmes without CPC preschool experience. Preschool participation was associated strongly with higher rates of high school completion by age 20, and significantly lower rates of juvenile arrest by age 18. It is hard to rule out threats to the validity of the findings in such quasi-experimental designs.

Parent-School Engagement

Portillo Pena (2009) examined the potential effects of a reading intervention, called the Power Lunch Program (a paired inter-generational reading aloud activity) on reading attitudes, reading motivation and reading achievement. The programme emphasised reading as an interactive and collaborative process between a child and a caring adult. Participants were taken from twelve public schools in the US, involving four cohorts (ranging from first grade to third grade, aged 6 to 9). All were African-Americans. Of the initial 1,866 students only 866 were included in the analysis (if they were matched with control or treatment condition within school/grade level, within the grade criteria, and had longitudinal data available). This study used a quasi-experimental design and examined results up to four years after the intervention.

It suggested that the intervention had a positive effect on academically at-risk elementary students' reading attitudes, motivation and achievement up to four years later, with small to medium effects. Because of the multiple components targeted by the programme (reading attitude, motivation and reading achievement) it is not clear what the direction of the effect of this part of the intervention is (is it AAB on achievement or achievement on AAB?).

Kyriakides (2005) conducted a comparison study of a parent-school partnership programme in Cyprus, getting parents to work with their children in the classroom while teaching was going on. The intention was to encourage close communication with parents and help them understand and value the purposes of school activities. Parents acted as advisors, learners and teacher aides in collaboration with the teachers. The intervention took place in one primary school with 92 year-five pupils, and comparison was made with a similar school in another village with 95 year-five pupils. Written and teacher assessments of mathematics, Greek language and social science were administered before the intervention, as a post-test, and again six months later in both schools. After the intervention, pupils in the intervention group achieved higher grades than the control school in teacher and external assessments in the three core subjects. The intervention was equally effective for all socio-economic groups, but was especially effective where the mother was a housewife (and perhaps had more time to commit to the programme). The study is small, contains no randomisation and so the authors are incorrect to quote probabilities instead of effect sizes, there was no control for possible confounding variables of the kind advised by Furnham (1995), the intervention school was a volunteer with an enthusiastic head teacher, and there is a strong possibility of a Hawthorne effect.

Moon and Callahan (2001) discussed the project Support to Affirm Rising Talent (START), which was a collaborative research effort between a university and a large urban school district. The authors suggested that parental involvement had no impact on the academic achievement of the primary-grade pupils from low socio-economic environments who participated.

Magnuson (2003) used an instrumental variables approach with data from the random-assignment US National Evaluation of Welfare to Work Strategies Child Outcomes Study to estimate the effect of maternal education on young children's school-readiness. Further analyses were conducted with two sets of nationally representative data from the National Longitudinal Survey of Youth Child Supplement (NLSY-CS). These suggest that when mothers themselves returned to school on their own initiative, their children's reading achievement improved, but not their maths. This was true regardless of the mothers' prior educational level. Return to school also predicted improvements in the quality of the home learning environments for the children.

Kratochwill *et al.* (2004) conducted a randomised controlled trial of a multi-family group programme called FAST (Families and Schools Together), involving parents more in their children's education, to improve classroom behaviour and academic performance. The study matched 50 pairs of American Indian children aged 4 to 9, and each was randomly assigned to the treatment or the control. Pre-test, immediate post-test and 9- to 12-month follow-up data were collected. Teacher ratings indicated that FAST students showed greater improvement in academic competence after one year, while immediate post-test results showed improvement in behaviour measured on the teacher-rated Aggressive Behaviour Scale and Child Behaviour Checklist. Improved classroom behaviour by the child due to parental involvement may be an intermediary step or simply a correlate of the outcome. The study is small, ethnically specific and relies on teacher reports. FAST has been tried in the UK and the early signs are encouraging, but in both the US and UK, the evaluations have only found very weak differences in actual attainment results (Crozier *et al.*, 2010).

Topping *et al.* (2004) considered a maths tutoring method used by peers, parents and other volunteers. Thirty children aged 9 to 10 of below average mathematical ability were randomly allocated to experimental or control conditions. The 17 experimental tutees were tutored in mathematical problem-solving at home by their parent using the method, while the 13 control children received traditional maths problem homework. Pre- and post-test assessment of both groups involved a criterion-referenced mathematics test in parallel forms and a scale of attitudes to mathematics. Experimental tutees

showed gains on the attainment test while control group did not. The study is small, and is not only about parental involvement, making the results hard to interpret.

Spoth *et al.* (2008) looked at the long-term effects of the Iowa Strengthening Families Program, aimed at improving parenting competencies. Sessions were conducted for two hours once a week for seven consecutive weeks, involving a parent and child. Families with sixth-grade girls from 22 rural schools with high free-lunch eligibility were randomly assigned to either the treatment (238) or control group (208). Outcomes were school engagement in eighth grade, assessed by questionnaire about attitudes to school, and academic success in the twelfth grade, measured using parent and child response to a question about the child's usual grades at school. There is always a danger with any intervention that participants in the study are more likely to drop out in one treatment group than another and this can bias the results. The authors therefore analysed the results on the basis of intention to treat. The intervention appears to have had a positive effect on school engagement in the eighth grade, and a slight positive effect on grade academic performance in the twelfth grade. There are no test scores and no attendance data for this study. Therefore, there is a danger of bias in reporting. The academic self-report was for overall performance. If a child received markedly different grades for math and English, for example, it would have been almost impossible for them or their parents to explain this in response to the question posed. It is not clear, even if the results are accepted, whether school engagement is a correlate or an intermediary step.

Bradshaw *et al.* (2009) conducted a randomised controlled longitudinal study of a Family-School Partnership, aimed at promoting parental involvement in educational activities and bolstering parents' behaviour-management strategies. The interventions involved training teachers, school mental-health professionals and other school staff in how to build partnerships with parents. There were also weekly home-school learning and communication activities, and nine workshops for parents conducted by a first-grade teacher, plus a social worker or school psychologist. The study involved 678 African-American children in first grade, following them through to high school and age 19, randomising half to the treatment and half to a control. The teachers were also randomised to treatment or control. The outcomes monitored were achievement, special education service use, graduation and participation in post-secondary education. Grade-twelve reading and math scores were measured using standardised Kaufman Test of Educational Achievement (KTEA) scores. Grades six to twelve classroom behaviour and academic performance were assessed using teacher reports. School records provided information on high school graduation rates. Where data were missing from school records, self-report data from student's age 19 interviews were used. The intervention had no discernible effect on teacher-rated academic performance, KTEA reading performance, special education use, high-school graduation or college attendance. There was a small difference in KTEA maths performance. This is a large and generally well-conducted study. Only 574 students were tracked through to grade twelve, meaning that the results for over 15% of the cases are missing or refused. Since these cases cannot be assumed to be a random subset of the original cohort, there must be some doubt about the meaning of the reported 'significant' improvement in maths.

In summary, parental involvement shows some promise as the basis for an intervention to improve school outcomes from early years to early adulthood. Success may be intervention-specific, meaning that considerable care needs to be taken in designing ameliorative approaches for the future. Some interventions showed no effect. Several interventions combine activities for parents with activities for schools, nurseries and other settings. In these cases it would be inaccurate to describe the approach as solely about parental involvement. This theme is picked up again in Chapter 8.

Mechanism

Two relevant mechanisms explaining how parental involvement could affect pupil attainment have been referred to in this literature:

'parent as teacher': in which parents' instructional behaviours are expected to raise the child's achievement (this can be regarded as an 'additional resources argument', where more teaching improves outcomes), and this may have a pedagogic impact or even a long-term impact on cognitive ability; and

'parent-school alignment': in which the cultural norms of communication and behaviour in the home may be made closer to those expected in school. Children who come from homes where the rules of communication and behaviour are very different from those they encounter in school may be expected to experience difficulties in interpreting expectations at school. This can build a sense of frustration, compounding initial problems in interaction with teachers.

Either mechanism may initiate a reinforcing cycle. This can happen when teachers encounter children who are 'less ready for school' which may dampen their expectations of the progress these children can make. This may be observed in classroom organisation through seating arrangements (table setting in primary classrooms), setting or streaming at secondary school, or the level and character of teachers' interaction with a child. It can also happen when a child begins to make comparisons between their own achievement and the achievement of peers. There is potential for subsequent compounding of disadvantage through the kind of mechanism envisaged by self-efficacy theorists (see Chapter 6).

While both mechanisms might be viewed as important in 'school-readiness', they may also be important as a child's schooling progresses. The 'parent as teacher' mechanism may affect the quantity and richness of instructional support for a child throughout their schooling. A parent who is knowledgeable about the education and assessment system, or becomes more knowledgeable as a result of an intervention, may be in a better position to assist their child with homework, coursework, revision and choice of appropriate subjects. The 'parent-school alignment' mechanism may be more noticeable during critical moments during a child's time at school (such as when the school is unhappy with a child's behaviour or motivation, or when there are important choices to be made about curriculum pathways to follow). There was less mention in the pieces reviewed here of more general parent-child relationships and issues such as closeness and personal warmth. However, it is possible that these are at least part of the explanation for the link with parental involvement (and parenting style, dealt with in a later section of this chapter).

Conclusion

Parental involvement in a child's education is a strong and plausible candidate for a causal model of improvement. There is some evidence of association, and of the correct sequence from involvement to attainment (and occasionally participation). There have been successful interventions in different contexts, and there are at least two plausible mechanisms of explanation. Future work should be focused on identifying the key elements and timing of a successful intervention (the active ingredients), and how best to engineer these into practical steps for policy and practice. It is not possible to estimate the costs and precise gain of this until these key elements are known. Any such intervention may have benefits for the child, and the parent, beyond attainment and participation in formal education.

Parental substance abuse

Goodman and Gregg (2010) mentioned substance abuse (heavy drinking, taking powerful or illegal drugs and, increasingly, smoking tobacco) as something that their datasets included, and as a characteristic of families with what the authorities consider to be serious behavioural difficulties. However, the authors did not present any explicit evidence of an association between parental substance abuse and a child's educational outcomes.

Association

This new review found no studies of cross-sectional association between parental substance abuse and a child's educational outcomes. Part of the reason for this could be that, by its nature, an association between prenatal events and attainment must be the subject of a longitudinal study, and so would be covered in the next part of this section. It should also be recalled that none of the databases searched specifically covered medical evidence.

Sequence of events

Some older research has shown that children's subsequent cognitive ability is associated with prenatal exposure to alcohol (Coles *et al.*, 1991; Streissguth *et al.*, 1990; Goldschmidt *et al.*, 1996; Olson *et al.*, 1992; Olson *et al.*, 1997), but the sizes of the correlations are small.

This new review found three full longitudinal studies on this topic. One suggested no link from prenatal alcohol use to educational outcomes, one suggested a lowering of ability and subsequent achievement, and a third suggested no influence from prenatal cocaine use.

O'Callaghan *et al.* (2007) used the Mater-University of Queensland Study of Pregnancy, which involves a cohort of 7,223 children born to mothers enrolled at prenatal classes in Australia. When they were 14 years old, 5,139 of the children (now adolescents), and their mothers, completed attentional and learning questionnaires, and 3,731 of the adolescents completed psychometric assessments. For the children, measurements of achievement included the Wide Range Achievement Test – Revised, and Raven's Standard Progressive Matrices Test. Their behaviour was measured using mothers' report on the Child Behaviour Checklist, and their own Youth Self Report. Learning was assessed by a series of questions in the mother and adolescent questionnaires. Mothers' behaviour included the quantity and frequency of alcohol consumption and the extent of binge drinking. The study found that for young people whose mothers consumed less than one glass of alcohol a day in the early or late pregnancy stages, there was no association with any attentional, learning or cognitive outcomes. Analysis before adjustment showed that exposure to more than one glass a day in late pregnancy was associated with an increased prevalence of overall learning difficulty in the children. However, this association disappeared after adjustment for context.

Howell *et al.* (2006) recruited 265 adolescents with a mean age of 15, 181 of whom were born to mothers from one prenatal clinic in Atlanta, Georgia. Most of the adolescents were African-Americans from poor SES backgrounds. Of the 265, 128 had been prenatally exposed to alcohol via mothers who were heavy drinkers, 53 were controls with mothers who did not drink during pregnancy, and 84 were special education students. Attainment measures were adolescents' cognitive ability (using the Wechsler Intelligence Scale for Children), academic achievement (using the Wechsler Individual Achievement Test), academic achievement in school (Iowa Tests of Basic Skills) and Grade Point Average (GPA) for current and previous years. Other measures included adolescents' adaptive behaviour (Vineland Adaptive Behaviour Scales), special education placement, conduct and attendance, physical health (physical dysmorphia score), care-givers' current alcohol and drug use (Addiction Severity Index). Young people exposed to alcohol prenatally had significantly lower IQs than those in the other groups, and showed significant deficits on mathematics subtests. There was no increased incidence of conduct problems in school records related to alcohol exposure (e.g. absenteeism, school dropout) compared to control groups. Since participation was voluntary there may have been a pre-existing bias in these naturally occurring groups.

Hurt *et al.* (2005) involved 135 children (62 with gestational cocaine exposure and 73 without), who were enrolled at birth, followed prospectively and had completed the fourth grade. Data were obtained from school report cards, standardised test results, teacher and parent report and birth and early childhood data. Successful grade progression was defined as completing US grades one to four without being held back. The study found that children exposed to cocaine during pregnancy and control children did not differ

substantially in school performance, in terms of successful grade progression, GPA, reading below grade level, and standardised test scores in reading, maths, and science. Children who completed grades one to four without retention had higher IQs and better home environments, regardless of cocaine exposure. This suggests that better home environment and higher IQ are more important factors for successful grade progression than gestational cocaine exposure.

There is, in summary, very little solid evidence here for a sequence leading from prenatal parental substance abuse to a child's educational outcomes, and no reports were found of parental substance use and older children's education.

Intervention

This new review found no reports of controlled interventions to improve children's educational outcomes by adjusting parental substance abuse. Ethically, it is difficult to envisage what these could have been. Perhaps some kind of regression discontinuity design could be used, involving those just above and just below a threshold for enforced drug treatment.

Mechanism

There are at least three possible mechanisms to explain how parental substance abuse could lead to altered attainment levels for a child. The first two of these ought to be reflected in other lines of explanation in this review. First, parental substance abuse might reduce the capacity of parents to engage in positive behaviours (such as those considered elsewhere in this chapter). Alternatively, parental substance abuse may foster substance abuse by children (see separate section in Chapter 7). There is also the possibility of neonatal damage, producing long-term differences in learning ability. However, there is so little evidence to explain here that there is little point in speculating further at this stage.

Conclusion

It is notoriously difficult to demonstrate the absence of something, especially from such a wide-ranging but inevitably partial search, which is why social science adopts a principle of parsimony or simplicity. And it must be recalled that the search for this new review did not include medical databases. Nevertheless, the conclusion of this review, as it stands, has to be that there is no evidence for a causal link from parental substance abuse to children's educational outcomes. This is not to condone substance abuse during pregnancy, or deny that it has other possible dangers. Nor does it deny that evidence exists (but was not found in these databases), or will exist in the future. But at present, anyone with a sole concern to improve educational outcomes for those most at risk of underperformance would be advised to seek an intervention elsewhere.

Parenting style

Goodman and Gregg (2010) showed that simple differences in parenting styles and rules (such as having regular bedtimes or family mealtimes) are linked to poverty, with poorer children often facing less regularity in their lives. By the age of 3, infants' test scores are already slightly linked to whether they have a regular bedtime. Is there wider evidence that such links are causal?

Association

A few studies showed a link between parenting style and school outcomes, and with the 'authoritative' style associated with most success (Terry, 2008; Sektnan *et al.*, 2010). Brown and Iyengar (2008) conducted

a literature review on parenting styles and achievement, suggesting that what they termed 'behavioural' and 'psychological' control were the two parenting styles most closely related to higher academic achievement. Hill (2001) found that low parent SES and parenting strategies, such as 'hostile and non-supportive', were associated with each other and with lower literacy scores for the children. Nuijens *et al.* (2000) employed self-reports from seventh and tenth graders to examine parents' levels of education and features of parent-adolescent relationships as predictors of adolescents' academic performance. Features of parent-adolescent relationships were assessed as follows: mothers' and fathers' influence with respect to academic performance, subjective closeness with mothers and with fathers and positive and negative emotions experienced in the relationships with mothers and fathers. Adolescents' academic performance was assessed by GPA, academic functioning and academic motivation. Parents' education was not a strong predictor of child achievement, but mothers' education was related to children's academic motivation. There was little pattern in the seventh grade, but by the tenth grade, academic performance was highly correlated with the closeness of parent-adolescent relationships.

A small number of studies found a weak association between religious observance and parenting styles in families, and school outcomes in the USA, often among African-Americans. These were generally small studies. Abar *et al.* (2009) looked at only 85 students, and the correlated measures, including attainment, were only self-reported. The research found that highly religious students tended to perform well academically, study better, and engage in fewer risk behaviours than young people who were less committed to religion, and that the authoritative style of their parents was associated with high levels of academic performance and study skills. Despite weakness in such studies, there were some bold causal claims such as that 'religiosity during adolescence has a significant effect on total number of years of schooling attained' (Loury, 2004, p. 119), 'church attendance during adolescence significantly increases total years of schooling that individuals obtain' (Loury, 2004, p. 125). Loury (2004) used the National Longitudinal Study of Youth but excluded all African-Americans, and all non-mainstream Christian denominations. The study found a substantial and appropriately contextualised association between the number of weeks attending church per year and the child's number of years of schooling.

There is, therefore, a *prima facie* case for a causal model linking parenting style and school outcomes, but not for religious observance itself and school outcomes.

Sequence of events

This new review found three further longitudinal studies on this topic. All three suggest a link between parenting style and outcomes, when considered in the necessary sequence for a causal model (i.e. where the parenting style precedes the educational outcome).

Flouri (2007) used UK Birth Cohort Study 1970 data, and found hyperactivity as a child, and mothers' authoritarian parenting, were negatively associated with educational outcomes when the child was aged 26. This result only involved high-SES parents. Gregory and Rimm-Kaufman (2008), with a small sample of 142 children and observation of parenting practices, found no link between mothers' behaviour when the child was at an early age and subsequent year-nine SAT scores, but a later link to the likelihood of graduating from high school. There were limited SES controls in this study.

Blondal and Adalbjarnardottir (2009) conducted a longitudinal study of 427 Icelandic young people. The study examined the relationship between the young people's perceptions of parenting style, parental involvement in their education and their chance of dropping out of school. Results indicated that adolescents at age 14 who characterised their parents as authoritative (showing acceptance and supervision) were more likely to have completed upper secondary school by age 22 than adolescents from non-authoritative families, after controlling for adolescents' sex, SES, temperament and parental involvement. Even after controlling for previous academic achievement, adolescents from authoritative families were less likely to drop out than adolescents from authoritarian or neglectful families. Parenting style was a better predictor of school dropout than parental involvement.

Therefore, although the evidence is sparse, there is enough evidence here for the field to move on to controlled intervention studies.

Intervention

This new review found no researched interventions attempting to alter parenting style and so influence attainment or participation.

Mechanism

Parenting styles have been categorised in terms of the extent to which they are authoritarian or dialogic, and authoritative or neglectful. There are at least two main hypotheses. First, children who develop an expectation of, and capacity to engage constructively in, dialogic relationships with adults will be better prepared for school. This mechanism is sometimes associated in the literature with the parental involvement and behaviour described above. Second, children who experience a more authoritarian parenting style may be more likely to conform with a school's expectations of them. In particular, they may be more likely to continue to participate in formal education. Taken together, the predictions of these two hypotheses suggest that for a child who has experienced authoritarian parenting, their attainment may be depressed by weak capacity to engage in dialogic relationships with teachers, while attainment and participation may be enhanced by a reduced risk of dropping out. These outcomes should be relatively easy to test.

Conclusion

Parenting style is intertwined with other issues, such as parental involvement (dealt with in an earlier section of this chapter), and this makes it hard to synthesise the evidence available. At present, anyone with a sole concern to improve educational outcomes for those most at risk of underperformance would be advised to seek an intervention elsewhere. However, there may be enough evidence here of an association between authoritative parenting and school outcomes to investigate further through a trial, if an appropriate intervention can be devised. Perhaps, though, this issue is best dealt with as part of work on the much more promising line of parental involvement.

6 Child aspirations and attitudes

This chapter looks at the review evidence on the effect of an individual's aspirations and attitudes on their attainment and participation in education. The five sections cover aspirations and attitudes in general, motivation, self-concepts and self-efficacy. None have enough evidence for a complete causal model.

Individual aspirations and expectations

Individual aspirations and expectations are considered important because they might influence key choices, and outcomes such as educational achievement and occupational attainment. Goodman and Gregg (2010) said: 'Among the young people's attitudes and behaviours that we capture in our study, it is expectations for higher education formed by age 14 that make the greatest contribution to the gap in test scores between young people from rich and poor backgrounds.' They went on to point out that aspirations therefore 'potentially have an important part to play in explaining why poor children typically do worse at school'. This is, according to their report, a major area for policy to make a difference, especially where aspirations are raised early on in a child's school career. So, they recommended 'raising children's aspirations and desire for advanced education – from primary schooling onwards'. Is this really a causal model?

Associations

There is a long-established suggestion that educational expectations and achievement (Duncan *et al.*, 1972), and expectations and educational participation (Reynolds and Burge, 2008), are linked. Many studies suggest that young people with higher educational aspirations have greater motivation and higher educational attainment than their peers (Desforges and Abouchaar, 2003; Flouri, 2006; Jacob and Wilder, 2010). Blaver (2010) looked at 1,391 Hispanic young people from the 2003 Trends in International Mathematics and Science Study (TIMSS), and found that self-reported competence in maths was associated with future educational aspirations, and also with maths achievement. Using data from the Longitudinal Study of Young People in England, Cuthbert and Hatch (2008) found that the aspirations of young people and their parents were associated with their educational attainment. See also, Abu-Hilal (2000) in the separate section later in the chapter on individual attitudes to school.

Yet several studies in this new review also revealed evidence that this simple association between aspirations or expectations and school outcomes might be something else. In fact, several reports show very similar patterns of aspirations for different social groups, such as rich and poor pupils, despite their different levels of attainment (Turok *et al.*, 2008; McKendrick *et al.*, 2007; Calder and Cope, 2005). Marjoribanks (2005) used an Australian dataset (Longitudinal Surveys of Australian Youth) and found that adding student expectations to a regression model to 'predict' educational attainment reduced the apparent association with student socio-economic status (SES). This means that each variable acts as a proxy for the other, and any analyses not using SES are in danger of overestimating the association of outcomes with expectations.

Therefore, this new review finds some evidence of an association between aspirations/expectations and school outcomes, but largely when SES background and prior attainment is not accounted for.

Sequence of events

The relationship between educational outcomes and aspirations/expectations seems to be a complex one. Aspirations can be both a predictor of educational achievement and an outcome of it, and might be influenced by self-esteem or self-efficacy, personal traits, experiences and mediating family factors (Gutman and Akerman, 2008; Strand and Winston 2008), or linked to beliefs about ability (Phillipson and Phillipson, 2007). Self-esteem and self-efficacy are addressed in separate sections of this chapter. Jacob and Wilder (2010) suggested that it is this potential iteration between expectations and attainment that makes it difficult to determine the primary causal structure. Young peoples' aspirations and expectations are not always a constant and can change rapidly during their school years (Gottfredson, 2002, and see below). So it is perhaps not surprising that the studies in this new review that are explicitly about attitudes or expectations and school outcomes do not provide a consensus.

Lin *et al.* (2009) looked at the progress of 2,000 pupils from grades seven to eleven, and found that the rate of progress was positively related to the expectations of pupils in year seven. However, this study had no measures of context.

Croll (2009) used the Youth Questionnaire from the British Household Panel Survey, from the mid-1970s to the early 2000s, and claimed that the 'results show that most children can express intentions with regard to future participation very early in their secondary school careers and that these intentions are good predictors of actual behaviour five years later' (p. 400). Children were asked from the age of 11 onwards whether they wanted to stay on in education after the age of 16. At age 11, for example, 67% of those who gave a definite reply said that they intended to stay on, and 72% did in fact remain in education. But the author seems to have misinterpreted this data. The 72% and the 67% are different subsets of the sample of children. It is not that all of the 67% and a few more all stayed on eventually. In fact, any predictions based on these reported intentions at age 11 would be less accurate than simply assuming that all children would stay on.

Beal and Crockett (2010) conducted a longitudinal study of three cohorts of students (grades seven, eight and nine) surveyed annually through to twelfth grade, and followed up into early adulthood. Of those who were invited, 90% took part in the first survey and 60% participated in the young adult follow-up. The study explored 317 adolescents' occupational aspirations and expectations, educational expectations, behaviours (using reported participation in school activities) and young adult's educational attainment. Occupational aspirations and expectations were measured using open-ended questions such as: 'What kind of work would you like to do?' and: 'What work do you think you will probably do?' while educational expectations used questions such as: 'How far do you plan to go in school?' High school behaviour (positive behaviours in which adolescents should engage for attainment and negative behaviours that they should avoid for attainment) were measured using the Primary Prevention Awareness, Attitudes and Usage Scale. Educational attainment was measured in response to the question: 'How much education have you completed?' Academic performance (GPA) was assessed with the question: 'What are your marks in school?' Occupational and educational aspirations and expectations remained fairly stable from year to year. Expectations may be partially mediated by participation in extra-curricular activities. No correlation was found between behaviour and expectations and aspirations, but adolescents' aspirations and expectations predicted adult educational attainment eight years later.

Liu (2010) used a nationally representative sample of students from the US Education Longitudinal Study of 2002, when the students were in the transition from high school to college or employment. The cohort's educational aspirations had generally declined from fairly high in tenth grade (between 'Graduate from college' and 'Obtain Master's degree or equivalent') by the time they reached the end of high school. Students who retained high stable aspirations were the most likely to continue in education. Jacob and Wilder (2010, p. 10) claimed: 'Even after we control for a host of individual, family and school characteristics, tenth grade expectations are strongly predictive of eventual enrolment.'

On the other hand, high educational aspirations do not predict high attainment for all ethnic groups (Strand, 2007), and so they cannot be a general 'cause' of attainment. Bui (2007) used US National

Education Longitudinal Study (NELS) data to examine the relationship between educational expectations and academic achievement among 10,261 students in grades eight, ten, and twelve. The author claimed that a cross-lagged analysis shows that there is evidence of reciprocal effects between educational expectations and academic achievement, but that the path from academic achievement to educational expectations is stronger than, and predetermines, the reverse path. Attainment seems to come first in sequence.

Intervention

This new review found no rigorous evaluations of interventions explicitly concerned with raising or lowering aspirations or expectations and so influencing educational outcomes. There will, presumably, have been many attempts to intervene with policy or practice to influence aspirations/expectations. None were found as part of a randomised controlled trial or similar.

Mechanism

A causal relationship between aspirations and achievement is quite widely accepted in the sociology of education. Bourdieu, for example, has argued that students 'internalise the odds' of their social group and thus reproduce the 'objective chances' imposed by the social structure (Nash, 2000). This sociological type of explanation is both structural and individualistic in nature. It provides a plausible explanation for the well-established finding that educational outcomes are stratified by SES and family background, and for the observation that individual learning trajectories may, and often do, not align with that stratification. The pattern of an individual's background provides a structure for early learning events, which creates a normalised identity as a (non)-learner or prospective learner. This leads to a tendency towards stratified outcomes. But since the identity is only a filter for the individual, their choices plus serendipity prevent that tendency from becoming a complete pattern. Put succinctly, patterns appear when looking at many individual lives, but whimsy can appear when looking at only one individual.

A major problem with this approach is that it is easy to find evidence for, but hard to test thoroughly. The theory suggests that aspirations are deeply rooted in family relations and the social context in which that family is embedded. The theory predicts that it will be very difficult to change aspirations through interventions that leave the familial and peer environments unchanged. New information made available to the student or the parent is expected to be interpreted in ways that are consistent with their existing frames of reference, sometimes leaving aspirations more or less unchanged. What is needed is a radical alteration in the family and peer environment, which is unambiguously unrelated to parental intentions. This would usually rule out changes such as a parent moving to a higher-status job or enrolling as a mature student for a university degree, since these might influence the outcomes in other ways (acting as confound). Conversely, achievement differences (e.g. for children enrolling in private schools through a state-administered voucher scheme) are potentially attributable to aspirations unless data are collected that enable the more general association between aspirations and attainment to be ruled out.

Conclusion

As with parental expectations (dealt with in the previous chapter), there is not enough evidence here for a causal link between aspirations/expectations and educational outcomes. Crucially, no study has been found that shows altering aspirations actually leads to difference in outcomes. Perhaps the variance 'explained' by aspirations in the Goodman and Gregg (2010) model reflects mostly the accuracy of individual's imagined futures, or the quality of the feedback they have received from schools.

There is also the problem that intentions, aspirations and expectations are very changeable. While this might seem desirable for any intervention intended to change them, the actual level of

volatility makes them unreliable as indicators. Croll (2009) found, but did not report as such, that less than 41% of children expressed the same aspiration at least four times when asked annually from year seven to year eleven, meaning that the majority of pupils expressed an intention to stay on in education *and* an intention not to. So, their intention must be right but is also wrong. In their study, Jacob and Wilder (2010) also reported that around 60% of students in their dataset updated their educational expectations at least once, and that expectations have become less predictive of school attainment over past decades. There may be good reasons for this volatility. For example, using longitudinal datasets from the Netherlands, de Groot *et al.* (2011) looked at peoples' intentions to move house. Intervening events such as family break-up led to moves that were not originally intended, while events such as job loss might prevent a previously intended move. If there is little link between intentions and real outcomes, then there cannot be a good causal model.

There is some evidence that child aspirations are already realistic (which is perhaps why they show signs of correlation with outcomes), and a suggestion that to increase them further might be more than the UK labour market and higher education system can accommodate (St Clair and Benjamin, 2011). Nash (2000), on the other hand, used Progress at School data from New Zealand, and showed that aspiration is not closely associated with SES background. The aspirations of Pacific Islander students are generally very high, and bear little or no relationship to their scholastic achievements. This means that for a large body of students, aspirations are unstratified by class, ethnic origin and attainment at school. See also Gorard and Smith (2010). This is an important point because if aspirations were stratified by SES, then raising aspirations for children from lower SES families would be fairer even if the 'system' could not cope. But if they are not stratified, then, and importantly for the rest of this review, falling short of one's early expectations and aspirations might perhaps lead to lower emotional and psychological well-being in adulthood (Hardie, 2010). There are, therefore, possible dangers in raising aspirations without raising competence. And if competence is raised, is there still a need to raise aspirations artificially? This is a very difficult issue, and it is not clear that researchers, policy makers or practitioners have thought through the implications here.

At present, anyone with a sole concern to improve educational outcomes for those most at risk of underperformance would be advised to seek an intervention elsewhere. However, if an intervention could be devised that isolated aspiration/expectation from other factors, then it might be worth testing whether raising aspirations really does lead to a difference in attainment.

Individual attitude

Attitudes, such as feelings about the value of schooling or a wish to participate in specific subject courses, are generally linked to SES background, and to related concepts like self-esteem (dealt with in a separate section of this chapter). However, they are also related to issues like enjoyment of school, which are not themselves linked to SES background (Gorard and Smith, 2010). Goodman and Gregg (2010) present no explicit evidence of a link between children's (as opposed to parental) attitudes to education and educational outcomes. Attitude here is taken to include school engagement, but is distinguished from aspirations, self-esteem and so on (dealt with in separate sections of this chapter). Goodman and Gregg (2010) suggest that 'policies aimed at improving attitudes ... among teenagers could have some beneficial effects in preventing children from poor backgrounds falling yet further behind during the secondary school years'. What does this new review find about such a claim?

Association

This review found few studies of association between individual attitudes and educational outcomes, and as a whole these do not provide convincing evidence that there is a strong correlation.

Twist *et al.* (2007) found some links between attitudes to reading and reading attainment for 200,000 9- and 10-year-old children in 41 countries in the Progress in International Reading Literacy Study (PIRLS). Hillman (2010) reported an association between positive pupil attitudes towards engagement with school and their achievement. Abu-Hilal (2000) used a sample of 280 grade-nine, eleven and twelve students from one high school in California, and measured their attitudes to school subjects (English, maths, science and social studies and school in general), level of aspiration ('How far do you think you will go in school?') and standardised achievement tests in the four core subjects. There was only a very weak association between attitudes and achievement (0.04), but a stronger association between attitudes and aspiration (0.25), and aspiration and achievement (0.48). The latter may be simply because those who do well are more likely to think that they can go further in education because they know that the probability they can do so is high (see previous section on individual aspirations).

Sequence of events

This new review found four further longitudinal studies on this topic. One suggests a link, one is of poor quality, and the other two both suggest that the sequence moves from attainment to attitude. This is the wrong order for the desired causal model.

Li *et al.* (2010) found a modest correlation (0.3) between a child's attitude to behaviour in school in year five and their academic outcomes in year six.

Harris (2008), in the Maryland Adolescence Development in Context Study, followed 1,407 seventh-grade pupils. But only 954 remained in the study in eleventh grade, and only 832 (less than 60% of the original sample) one year after high school. The authors looked at differences in beliefs about education and social mobility, and the claim that such beliefs are mechanisms by which the opportunity structure influences school behaviour, each with 'separate effects on academic outcomes' (p. 608). However, their results are unclear. In the first stage of their model they use only beliefs as a predictor, while prior attainment is entered into the model at the very end, once the majority of explicable variation has been accounted for.

Mattern and Schau (2002) involved 458 white seventh and eighth grade students in eight rural schools in northern New Mexico. Excluding those with less than 50% of the relevant sub-scores (three attitude constructs and four achievement sub-scale scores) the sample dropped to 441. A further three cases with outlying scores were excluded, leaving 438. Attitude to science (as a school subject) was measured in terms of liking for science (affect), perceived self-competence in science (cognitive competence) and reported usefulness of science (value). These three were chosen because they were comparable to attitude measures used in previous studies. Achievement was measured using a multiple-choice test of students' general science knowledge (items were taken from those used in the 1990 US National Assessment of Educational Progress (NAEP)) and a set of four select-and-fill-in concept maps that assessed students' connected understanding of science concepts. Data were taken twice – once at the beginning and again at the end of the school year. For boys, the best-fit structural model was the no-attitudes path model, suggesting that previous attitudes did not have an important link to subsequent attitudes. Post-attitudes were influenced by previous achievement, according to the authors. Boys' prior attitudes did not have a greater link with their later achievement than their prior achievement. Girls' achievement was not linked to their prior attitudes (once their prior achievement was accounted for). In other words, girls' prior science achievement is more strongly linked to their later achievement than their prior attitudes. Therefore, teaching strategies that stress achievement could well lead to an improvement in science but have little effect on attitudes. On the other hand, interventions to develop positive attitudes toward science should result in more positive post-attitudes, but would be likely to have no discernible effect on achievement.

Ma and Xu (2004) analysed data from the Longitudinal Study of American Youth (LSAY) in secondary school grades seven to twelve. This involved 50 middle and high schools, from each of which about 60 seventh graders were randomly selected, and then followed for six years. The total sample was

3,116 students (1,626 males and 1,490 females). Maths achievement was based on test scores in basic skills, algebra, geometry and quantitative literacy. To ensure comparability of test scores across years, multiple-group item response was used to equate scores for each year. Attitude towards maths was measured using student self-responses on three indicators: 'Mathematics is useful in everyday problems'; 'Mathematics helps a person think logically'; and 'I will use mathematics in many ways as an adult'. The results showed that the cross-lagged link between attitude in grade seven and achievement in grade eight was minimal. For an individual's entire secondary school career, achievement preceded, and in the words of the authors, 'demonstrated causal predominance over', attitudes. Prior achievement significantly predicted later attitude across grades seven to twelve. Prior attitude, by contrast, did not meaningfully predict later achievement. If this study is valid, an institution's ability to affect students' level of achievement via attitudinal change is minimal (Hom, 2004).

Intervention

This new review found only one study that involved an intervention to improve attitude and therefore attainment. This study is small, relates to a specific undergraduate course, and has an unclear outcome.

Duze (2010) examined the effects of Participatory Learning Technique (PLT) on the achievement and attitude of undergraduate BEd students on a research methods course. The study was based on a sample of 60 students (30 in experimental and 30 in control groups). Performance was measured using a criterion-referenced test covering topics in the course, and attitude was measured using a 50-item attitude inventory scale. Those exposed to PLT performed better than those who were taught in the traditional lecture method. They also exhibited more positive attitudes towards their course. Pre-test results had showed that the two groups were similar in terms of achievement and attitude toward the course. This confirmed an earlier study conducted with MEd students (Duze, 2005). The study did not test whether enhanced attitude caused an improvement in achievement, or whether PLT led to better achievement and hence enhanced attitude.

In summary, the review found little solid evidence that intervening to alter attitudes can lead to improvements in educational outcomes.

Mechanism

There are some obvious possibilities for explaining how attitudes might translate into attainment or participation, such as that liking going to school leads to better attendance and more enthusiasm for learning. However, as shown above, the evidence for a causal link is so weak in all three prior parts of this causal review that there is no immediate need for an explanatory mechanism. It may also be that the key and specific attitudinal issues are dealt with in other sections of this chapter.

Conclusion

No real evidence was found that attitudes towards educational issues, other than those dealt with separately (if they are considered to be attitudes), are linked to levels of attainment or participation. There is not even a promising foundation for future work here. At present, anyone with a sole concern to improve educational outcomes for those most at risk of underperformance would be advised to seek an intervention elsewhere.

Individual motivation

Goodman and Gregg (2010) cite motivation only as an outcome of schooling, and do not present any evidence that it is explicitly associated with educational outcomes. They describe a nationwide

government-funded voluntary programme (Social and Emotional Aspects of Learning or SEAL), which aims to promote five social and emotional skills that are thought to be instrumental for effective learning. One of these 'skills' is motivation. Alivernini and Lucidi (2011) stated that student motivation is the best single predictor of high school dropout. Is this backed up by the evidence of this new review?

Association

A number of studies have suggested weak associations between reported learner motivation and attainment or retention (Singh *et al.*, 2002; OECD, 2003; Robbins *et al.*, 2006; Unrau and Schlackman, 2006; Van de gaer *et al.*, 2007; Ream and Rumberger, 2008; Quirk *et al.*, 2009; Somers *et al.*, 2009). Much of this work was about motivation in relation to specific school subjects, such as maths (Meece *et al.*, 1990), and arts (Skaalvik and Valås, 1999).

Hayenga and Corpus (2010) studied 343 middle school pupils. They found that pupils reporting strong intrinsic motivation received higher school grades than pupils with reported extrinsic or mixed motivation (however strong those kinds of motivation were). Cheng and Ickes (2009) found similar results at college level, with 377 college undergraduates. Students with higher self-motivation had better academic performance (grade point average (GPA)), even after controlling for the students' previous academic performance (high school rank) and academic ability (SAT/ACT scores).

There is, therefore, some limited evidence of an association between motivation or type of motivation and attainment (or attendance at school). There was little evidence on motivation and post-compulsory participation. Studies of participation seem to refer to 'aspiration' (dealt with in another section) rather than motivation, but they may mean something similar.

Sequence of events

The highest quality and largest study, by some way, found no evidence that suggested intrinsic motivation was linked to attainment at high school, and this was confirmed by two other studies. Nor did the studies by Zanobini and Usai (2002) and Dowson *et al.* (2003), as discussed more fully in the section in this chapter on self-concept, find any evidence that self-concept could lead to attainment.

Keith and Cool (1992) used longitudinal data from a sample of 25,875 high school students who were members of the sophomore cohort of US High School and Beyond (HSB) study, to examine the effects of quality of instruction, motivation, academic coursework and homework on academic achievement. Only students who participated in the base year and first follow-up year were included in the analyses. HSB data measured quality of instruction and motivation, the quality of school, quality of instruction and parental and peer influences. The order in which the variables were included in the model was based on a logical and chronological sequence, and also on previous theory and research. Hence, background variables and ability were entered before the other variables. Quality of instruction came before motivation as high quality instruction generally leads to higher motivation, and a highly motivated student, in turn, completes a more academically oriented curriculum. Students in a more academic curriculum should complete more homework and therefore achieve a higher level. The authors did present six other models and showed that these were in almost all respects inferior in explaining the data. Ability had the strongest link to attainment (0.5), and quality of coursework and homework added further associations (totalling 0.4). This means that the bulk of any variation in attainment has been explained. Therefore, quality of instruction and academic motivation were unrelated to achievement (although motivation may be partly encompassed in coursework and homework). The authors expressed doubts about whether students' responses to questions about the quality of their school and its instruction actually measure quality of instruction and schooling anyway.

Schwinger *et al.* (2009) examined the link from motivational strategies to achievement for 231 eleventh- and twelfth-grade German high school students. Students' motivational strategies and

management of their own work were assessed based on students' self-reports. Students also completed an intelligence test, and their half-year grades (GPA) were assessed six months later. The study found that motivational strategies were not directly related to GPA. Intelligence and work management were both strong predictors of grades.

Gagne and St Pere (2001) studied 200 pupils, and showed that cognitive ability, or IQ, was the strongest single predictor of school achievement. If IQ is included in modelling, then any association between individual reported motivation and achievement disappears. If IQ is accepted as largely set before motivation, then this means that motivation is an outcome and cannot be a cause of achievement.

There is almost no evidence here to support a causal link from intrinsic motivation to attainment, and no mention of a link from motivation to participation.

Intervention

Intriguingly, given the shortage of basic evidence of a causal sequence, this new review found four intervention studies, in which extrinsic motivation was a major independent variable. Three of these concerned financial incentive payments.

Riccio (2010) reported on the Opportunity NYC: Family Rewards programme, examining whether offering low-income families cash rewards for engaging in activities related to children's education, family preventive healthcare and parental employment improves family and child outcomes. Under the programme, rewards were allocated to students and other family members. The authors compared the educational outcomes of students whose families were randomly assigned to participate with those who were not in the programme. More than 50 attendance and test-score outcomes for elementary and middle school students were examined. Family Rewards was found to be effective in improving the maths test scores of K-5 students (i.e. children in classes from kindergarten to fifth grade) in year two of the study, but the effect size was minimal. Among high school students, the programme was effective in increasing attendance rates and the number of students attempting eleven or more credits, and both attempting and passing exams.

Fryer (2010) examined the effect of financial (extrinsic) incentives on student achievement. The study analysed data on approximately 38,000 students from about 260 public schools in Chicago, Dallas, New York City and Washington, DC. Students were given monetary payments for performance in school (paid directly into bank accounts or by cheque). Students were paid three times a year, within days of verifying their achievement. The study found no statistically significant effects on standardised math or reading outcomes in Chicago, New York City or Washington, DC. Focus group interviews with students suggest that although students may be excited about the incentives, they do not actually know how to improve their grades. This is an important point to note for all attitude and aspiration work. Confidence may be misplaced without competence. However, paying students for inputs into the education production, such as for attendance, good behaviour, doing homework and wearing their uniforms yielded moderate improvements in reading and maths achievements. Paying students to read books yielded a noticeable increase in reading comprehension. In each of these cases it is reasonable to infer that the students knew what to do (they understood the school's definition of 'good behaviour').

Bettinger (2010) evaluated the effects of the Coshocton financial incentive programme, providing external motivation for academic achievement. Coshocton is an economically depressed Appalachian community in Eastern Ohio. Pupils in grades three to six were paid in gift certificates for every good test result in five core subjects. Each school had two grades from years three to six randomised to take part (a condition of the donor). Other grades acted as comparators for eligible grades in other schools. In total, it seems there were 24 treatment and 24 control grades, although the report does not make this easy to confirm. Motivation (intrinsic and extrinsic) was measured using the Academic Self-Regulation Questionnaire, and teacher-rated assessments. There appeared to be a positive effect on maths scores, with high scoring pupils more responsive to the incentives. There was no difference in reading. This may

be because extrinsic motivation is more effective for less conceptual tasks. Students can memorise a series of facts or formulae to prepare them for the tests, but it is more difficult for students to prepare for reading a specific text or writing on a particular subject. There was no evidence that pupils' intrinsic motivation was affected either way.

Kellow and Jones (2008) conducted an experiment that showed that white US high school freshmen (aged 14 to 15) who were told that their test performance would be predictive of their performance on a state-wide, high-stakes standardised test (evaluative condition) outperformed those in the non-evaluative condition. The high stakes, as perceived, were motivational. However, the African-American students in the evaluative condition performed almost the same as those in the non-evaluative condition. Here the high stakes made no difference. Self-perceptions of ability and expectations for success in maths were slightly lower for African-American students than white students in the evaluative condition. There were no differences in anxiety, goal-orientation and performance-avoidance between the groups. The study did not consider other variables, such as student characteristics, school environment and testing conditions, that might have influenced the results.

Mechanism

One explanatory mechanism suggests that some students will have stronger intrinsic (self-generated) motivation than others. This mechanism is closely related to the ideas of 'academic self-concept' and 'locus of control', since students who believe they are good at schoolwork and who believe that they can substantially affect outcomes through their effort are expected to be more motivated to achieve. This is dealt with in a separate section of this chapter. Another mechanism, more relevant here, suggests that all students will increase their effort if they perceive that current and future pay-offs are greater. This would be extrinsic (or externally-generated) motivation. Such pay-offs may come in the form of financial incentives for achievement or participation or the prospect of future earnings. However, whether the motivation is intrinsic or extrinsic, students must also know how to direct their greater effort. Motivating students to make more effort will not affect attainment if students do not, or do not know how to, direct their effort in ways that are likely to raise their achievement.

Conclusion

Motivation, like so many of the aspirations, attitudes and behaviours dealt with in this study, is intertwined with other issues, such as attitude and self-esteem (dealt with in separate sections of this chapter), and this makes it hard to synthesise the body of evidence available. At present, anyone with a sole concern to improve educational outcomes for those most at risk of underperformance would be advised to seek an intervention elsewhere. However, there may be enough evidence here of an association between extrinsic motivation and school outcomes to investigate further through a trial in the UK, if an appropriate intervention can be devised. And more work could be done on altering children's intrinsic motivation and seeking a link to gains in school outcomes.

Individual self-concept/self-esteem

Self-concept and self-esteem are covered together in this section because, as shown below, they are so strongly intertwined in the literature. Goodman and Gregg (2010) found that, 'even after accounting for long-run family background factors and prior attainment, [a child is] more likely to perform well in tests if ... [he or she] has a greater belief in his or her own ability at school'. So, they asked, 'will raising ... young people's self-esteem and ability beliefs have' an effect on attainment? This is a key question for this new review. What does the overall evidence suggest?

Association

Some other studies have linked academic self-concept to achievement, based on correlational or observational data (Cervantes, 2005; Peetsma *et al.*, 2005; Skaalvik and Skaalvik, 2009; Zimmerman, 1995). Shavelson and Bolus (1982) found a relationship between self-concept and achievement. Zand and Thomson (2005) found that African-American adolescents with high levels of self-worth were more likely to report having higher grades at school. Gonzalez-Pienda *et al.* (2002) used data for 503 12- to 18-year-old adolescents, and reported that their self-concept was statistically related to their academic achievement. Between them, a young person's aptitude and self-concept 'explained' most of the variation in attainment. Singh *et al.* (2010) collected data through a survey questionnaire in three school divisions in the southwest region of the US State of Virginia. There was a slight association between school outcomes (self-reported grades) and self-concept (at least for white pupils), and a slightly stronger link between a pupil's school outcomes and their sense of school belonging.

Baumeister *et al.* (2003, 2005) in a major and widely cited reanalysis of previous work, suggested that high self-esteem, in terms of the global self-concept, is not associated with better performance once other factors are accounted for.

Therefore, there is some limited but somewhat disputed evidence of an association between self-concept and attainment. There is no evidence here of an association between self-concept and participation.

Sequence of events

This new review found a large number of studies relating to the order of life-history events involving self-concepts and attainment (Helme and van Aken, 1995; Marsh and Shavelson, 1985; Marsh and Yeung, 1997; Green *et al.*, 2006; Neuenschwander *et al.*, 2007; Liew *et al.*, 2008; Whitesell *et al.*, 2009). Eight longitudinal studies presented evidence and models suggesting that self-concept (and self-esteem to a lesser extent) do not lead to attainment or participation in the way that a causal model would require. Five further studies presented evidence of a one-way sequence from self-concepts to outcomes. Finally, five studies suggested that self-concepts and school outcomes are iteratively linked, and are mutually the causes of each other.

Not a causal sequence

Maruyama *et al.* (1981) investigated self-esteem and attainment through a study of 1,613 children aged 4 to 15 in the Educational Follow-Up Study (EFUS) who were born at the University of Minnesota Hospitals in the early 1960s. The participants were reportedly representative of the white urban population in the north-central US, and their IQ scores were normally distributed. Social class and general ability were measured for younger age groups, and achievement tests using the Stanford Achievement Test and the Wide Range Achievement Test, which emphasises spelling, vocabulary, word recognition and arithmetic, were administered at age 9, 12 and 15. Self-esteem was measured by the Coopersmith Self-Esteem inventory at age 12. The authors reported that self-esteem and academic achievement were correlated, but no causal link could be drawn between those variables. They argued that as social class is so closely related to ability, 'it is impossible to separate their independent or unique influences on other variables. When they both share common variance with a third variable, it is likely that only one will be significantly related to that third variable' (p. 972). In instances when social class was found to be related to self-esteem, ability was not. And when ability was related to self-esteem, social class was not. They therefore concluded that ability (IQ) and social class are the underlying causal factors that affect the levels of both self-esteem and academic achievement.

Pottebaum *et al.* (1986) investigated what they term the 'self-concept' using items similar to those typically found in measures of 'self-esteem' such as 'I take a positive attitude toward myself', 'I am able to do things as well as most other people', 'On the whole I am satisfied with myself', and 'I feel I am a person

of worth on an equal plane with others'. They found no causal ordering from self-concept/self-esteem to academic achievement in a study of high school students. As with Maruyama *et al.* (1981), they also suggested that a plausible third variable (e.g. social class and/or ability) may be causally predominant over self-concept and achievement.

Tang (2004) used 12,144 students from the base year, and second and fourth year follow-up of the US NELS 1988–2000 database. Variables included SES, prior achievement, self-concept, locus of control, educational aspirations, parental expectations, parental involvement, peer influence, college plans, average grades, test scores, coursework completion and educational attainment. Prior attainment and SES were the strongest predictors. Once other measures were accounted for, locus of control and self-concept were not linked to subsequent attainment.

Scott (2004) analysed interviews with 11- to 15-year-olds in the sample households in the 1994–1999 BPHS, looking also at their educational achievements in later years (16 to 19). In context, self-esteem was unrelated to subsequent GCSE or A-level results. Nor was behaviour, like watching TV, related to examination results. Young people's intentions to stay on in school post-16 were strongly related to the odds of obtaining five or more GCSEs, but the sequence here is unclear since awareness of likely performance could affect stated intentions (see the earlier section in this chapter on aspirations and expectations). Young people's well-being, happiness and aspirations were related to attainment at GCSE, but not at A-level. This study is important as the multivariate analysis includes factors like family income, mother's occupation, family structure, housing tenure and parental education (all strongly linked to attainment). In fact, the more explanatory variables any study includes in analysis, the less likely it is that a mental concept like self-esteem is associated with educational outcomes.

Bachman and O'Malley (1977) used data from a nationwide longitudinal study to investigate the association between academic self-concept and attainment. Their data tracked more than 1,600 young men from when they were in the tenth grade in 1966 through to 1974. The study showed that students' self-esteem increased substantially over time. Self-esteem was measured using a modified version of the Rosenberg (1965) self-esteem scale. Although they found that students' educational attainment was correlated with their self-esteem, path analysis suggested that the level of self-esteem during high school had little or no direct causal link to later educational attainment (defined as final degree earned). The direct link from high school self-esteem to later educational attainment (final degree earned) was only 0.07, indicating that the relationship was extremely weak. The authors suggested that it was other likely causes in the students' lives, including family background, ability and scholastic performance, that were responsible for this miniscule correlation between self-esteem and attainment.

Bachman and O'Malley (1986) subsequently used a sub-sample of 1,487 eleventh-grade white males from the US Youth in Transition (YIT) nationwide study of high school students, to examine the effects of school academic climates on the pupil self-concepts of academic ability and global self-esteem, and their long-range educational attainments. Global self-esteem was again measured using ten items adapted from the Rosenberg scale. The authors used multiple indicators of academic achievement, students' self-reported grades and educational attainment (ranging from high school dropout to graduate study beyond a bachelor's degree). They found no association of these outcomes with academic self-concept and self-esteem, once background, ability and prior attainment was accounted for. The study only included white students.

Gottfredson (1982) used longitudinal data from the YIT project, based on a sample of 2,213 tenth-grade boys who responded from 87 schools. In the first follow-up, 85% of these continued to respond, with 81% in the second follow-up, and 73% in the third and fourth. Interviews and questionnaires were used three times during high school, beginning in tenth grade and participants completed questionnaires one year and five years after graduation. YIT data provided information on social and demographic backgrounds and a wide spectrum of personality measures. Personality characteristics were measured using sub-scales for anxiety, extraversion and commitment (social responsibility and academic achievement value and long range occupational goals). Academic achievement was measured using:

- Mental ability tests taken in tenth grade: the Quick Test of General Intelligence, the GATB-J test of vocabulary level and the Gates test of reading comprehension;
- GPA based on students' report measured in the tenth, eleventh and twelfth grades;
- Educational attainment, such as whether the student received a high school diploma, continued schooling or not, the number of years of schooling completed and highest degree earned.

The author claimed that students' personality at each time point could be explained by their personality in the preceding time point, and by their self-reported GPA for the past year. Anxiety, linked to low grades, was associated with lower grades in early years, but this link soon disappeared. Of the personality constructs, only commitment was related to educational attainment after high school, and this only weakly. The author suggested that commitment is largely a consequence of SES background and intelligence. Early high grades predict greater self-control, valuing of academic achievement and higher career aspirations (but not vice versa).

Chowdry *et al.* (2010) used the Longitudinal Study of Young People in England (LSYPE), and a compound measure of family economic circumstances reflecting income, housing tenure and parental occupation derived mainly from when the young person was aged 14. The authors drew on numerous other family characteristics such as parental age, education, number of siblings, health status and various measures of parent and young person's attitudes, notably parental aspirations, involvement in their child's education, degree of family closeness and educational resources in the home. They also used broad measures of the nature and quality of the secondary school each young person attended. The authors found that there were already major differences in attainment by socio-economic group at age 11, and that these differences increased at age 14, before narrowing slightly at age 16. Around two-thirds of the socio-economic gap in attainment at age 16 can be accounted for by prior attainment at age 11 (60%) and by long-term family background characteristics (a further 6%). This means that very little variation in outcomes is available to be explained by constructs like motivation or locus of control. Differences in the attitudes and behaviour of young people (15%) and their parents (8%) during the early teenage years can also explain part of the rich-poor gap at GCSE, and for the majority of the small increase in the gap between ages 11 and 16. Young people from poorer families were less likely to enjoy school, less likely to find school valuable and less likely to believe that their own actions made a difference (i.e. they were more fatalistic). Young people from poorer families were also more likely to engage in risky behaviour (linked to lower attainment) such as smoking, taking recreational drugs, truanting and engaging in crime. They were less likely to undertake positive activities (linked to higher attainment) such as playing sports, reading for pleasure and playing a musical instrument. Young people from poorer backgrounds were more likely to experience bullying at age 14. Better-off parents were more likely to help their children with their homework, more likely to get involved in school activities, more likely to share family meals and less likely to argue with their children – again all factors associated with higher attainment (Chowdry *et al.*, 2010). Young people from poorer families tended to rate their abilities lower than did those from better-off families but, after allowing for (objective) evidence on prior attainment at age 11, the poorer young people had actually tended to overestimate their ability while better-off young people had underestimated theirs. Therefore, simply increasing self-esteem or locus of control would seem to be unlikely to be effective. It could even be dangerous.

In summary, it is not surprising that previous reviews and studies (e.g. Newman, 1984 and Baumeister *et al.*, 2003) have also concluded that global self-esteem, at least, has no effect on subsequent academic performance.

One-way sequence

Some studies have proposed that self-concept led to school outcomes. Guay *et al.* (2004) used a sample of 465 primary school children whose progress was followed over ten years. They found that children

who perceived themselves as academically competent in early schooling had higher subsequent school achievement, but they found no associations with their limited measures of SES.

Zanobini and Usai (2002) reported on 92 children from 16 different classes in five Genoese lower middle schools, over one academic year, looking at changes in specific aspects of self-concept (social, competence, academic and physical self-concepts) and motivation, during the transition from primary to lower middle school. Self-concepts and motivation were measured using the self-completed Multi-dimensional Self-Concept Scale (MSCS) and the Academic Motivation Scale (AMS). The AMS scale measured extrinsic and intrinsic motivation as well as lack of motivation. Academic achievement was measured using teacher-assessed final school grades. In primary and lower middle schools, academic and competence self-concepts were somewhat correlated with final school grades. Motivation did not generally have an important influence on school grades. The study relied on teacher ratings for measuring academic achievement, and these were differently recorded in primary and middle schools. The sample was small and not clearly described.

Marsh *et al.* (2005) used a sample of 5,000 German pupils in early secondary school (aged an average of 13.4 years), and presented evidence of a link between academic self-concept and future grades, after taking prior achievement into account. However, there were no other context measures, such as SES, and it is important therefore to compare this with the larger studies above that had more background variables and found no impact from self-concept.

Dowson *et al.* (2003) studied students in the first three years of secondary school in southwestern Australia. Survey data for 2,132 students were collected over two waves about 10 months apart. Motivational goals were measured using the General Achievement Goal Orientation Scale developed by one of the authors (McInerney, 1997). This instrument measured three areas of achievement motivation: General Mastery (e.g. 'I am most motivated when I see my work improving'); General Performance (e.g. 'I am most motivated when I am doing better than others'), and General Social (e.g. 'I am most motivated when I work with others'). Academic achievements were measured using their end-of-semester examination scores for English and maths. Academic self-concept was measured using a modified version of the Marsh (1992) Self-Description Questionnaire II. Motivation accounted for only a small amount of variance (5% for English and 1% for maths) in achievement. Self-concept, on the other hand, accounted for 12% of the total variance (16% for English and 15% for maths respectively).

Using a multi-wave longitudinal panel analysis (YIT data), Marsh (1990) claimed at that stage that he had demonstrated conclusively that academic achievement was influenced by prior academic self-concept. He based this conclusion on the findings that reported GPAs in grades eleven and twelve were related to the academic self-concept as measured the previous year, while prior reported grades were not so clearly related to subsequent measures of academic self-concept. However, in later years Marsh altered this, saying that academic self-concept and achievement were both a cause and effect (Marsh and Craven, 2006; Marsh and O'Mara, 2008).

Reciprocal sequence

Chamorro-Premuzic *et al.* (2010) assessed 5,957 UK school children aged 9 for cognitive ability, academic achievement and self-perceived abilities. All were recorded as twins in the Twins Early Development Study. Achievement was measured based on teacher ratings using the National Curriculum (Key Stage 2 and Key Stage 3 criteria). Self-perceived abilities were assessed using the Perceived Ability in School Scale, which consists of nine items asking children how good they think they are at successfully completing the activities listed. Cognitive ability was assessed at age 9 using a test booklet containing four tests that students completed at home. At age 12, cognitive ability was assessed using a battery of online cognitive tests. Once cognitive ability was accounted for, self-perception and achievement at age 9 predicted both self-perception and achievement at age 12. The link between prior achievement and later self-perception was about the same strength as the link between prior self-perception and later achievement. The authors claimed that this was evidence of insight (children's accounts of their previous performance) and self-

efficacy (the self-fulfilling or motivational effects of self-beliefs). High-performing students apparently adjust their self-perception upwards, which might have a subsequent influence on their attainment.

Pinxten *et al.* (2010) used a sample of 1,753 students who were tracked from grade seven, through eight, ten and twelve. Academic self-concept was measured using nine items about students' perception of their academic competence such as: 'I think I am good at learning', and 'Homework is easy for me'. Achievement was measured using maths and language performance. Repeated measures of academic self-concept and achievement (standardised tests and teacher ratings) were examined with students on five occasions. Different models were then tested using Structural Equation Modelling. The purpose was to examine the structural relations between academic self-concept and achievement and how these relations might differ through the different ways in which achievement is measured. The authors concluded that results of causal ordering studies have to be interpreted very carefully as different measures of academic achievement can give different apparent causal patterns between academic self-concept and achievement. The skill-development model shows self-concept as a function of achievement (Valentine and Dubois, 2005; Skaalvik and Valås, 1999). The self-enhancement model, on the other hand, shows that higher academic achievement is the result of higher self-concept (Marsh, 1990). Pinxten *et al.* (2010) tend to support Marsh and Craven (2006) and Marsh and O'Mara (2008) in stating that the relationship between self-concept and academic achievement is a reciprocal one (see below).

Baumert *et al.* (2005) analysed longitudinal data from two nationally representative samples of German seventh-grade (13-year-old) students (comprising 5,649 and 2,264 individuals respectively). The prior self-concept of the student explained some of the variation in subsequent maths interest, school grades and standardised test scores. The authors concluded that self-concept is both an effect from, and a cause of, school attainment.

Grabowski *et al.* (2001) followed 1,000 students from ninth grade through to two years after high school graduation. They found that the students' self-concept had a direct and indirect link to post-secondary achievements, through educational expectations and the steps taken to prepare for college in the last year of high school. Global self-efficacy, on the other hand, had no clear link to academic performance. Self-efficacy was itself determined by social background and the individual's personal achievements (measured using satisfaction with work performance). Domain-specific self-efficacy was measured in terms of students' perception of their job based on the assumption that most of the students would have formal jobs by grade ten. This was obtained by asking students if they thought their pay was 'good', and if their job was demanding and stressful. The assumption was that if students perceived that they were paid well and that they find work not too stressful, it is an indication that they are confident, and are able to cope well. Therefore, self-efficacy is high. It was not clear why the authors did not measure students' academic self-efficacy instead. As not all students were in paid employment, work quality variables could not be included in the model. This, therefore, weakens the use of economic self-efficacy as a measurement. Global self-efficacy, on the other hand, showed no significant link forwards to any of the educational outcomes (actual post-secondary attainment, educational expectations and preparations for college). Although participants were randomly selected, they were also invited to participate and the study reported that girls and younger pupils were more likely than boys to agree to take part.

Marsh and O'Mara (2008) used YIT data to present what they call a 'definitive test' (p. 542) of claims that global self-concept has no effect on attainment, but that academic self-concept is reciprocally causally linked. However, even this reciprocal analysis is really only an association, where self-concept 'predicts' attainment at next stage and so on. No context variables were used, so there was a lot of unexplained variation for self-concept measures to soak up. Correlations were as low as 0.14. Less than 73% of the sample were still included in analysis by the end point (five years after school graduation). Since school dropout is linked to the academic self-concept, the latter could be acting as a proxy for school attendance. If so, the intervention would be to improve attendance, not the self-concept as such. Marsh and O'Mara (2008) claimed they were able to provide a definitive test of the reciprocal relationship between self-esteem, self-concept and school grades and attainment. They said (p. 549):

[A]cademic self-concept and performance are reciprocally related and mutually reinforced. Improved academic self-concepts lead to better performance, and improved performance leads to better academic self-concepts.

These are strong causal claims that, as with many writers in this field, are not fully justified by the evidence presented for them.

In summary, the evidence from studies of association and sequence is ambiguous. There are several difficulties. First, the theoretical and empirical distinctions between self-esteem (or global self-concept) and academic self-concept have been steadily sharpened by writers as they find that one or more operational versions of these ideas are ineffective. An association between self-esteem and attainment is not generally supported, while some studies support an association between academic self-concept and attainment (Valentine *et al.*, 2004; Marsh *et al.*, 2006). Second, more recent studies present the hypothesised relationship between self-concept constructs and attainment as reciprocal. However, it has proved difficult to find ways of separating the two hypothesised relationships empirically, and therefore it is not possible to rule out the causation being entirely from achievement to self-concept. Third, a majority of these studies have investigated relationships between academic self-concept and attainment for children in secondary school. Some studies focused on students close to the completion of compulsory education. Therefore, it might be argued that any effects of academic self-concept or of prior attainment are already embedded in children's attainment, which is used as a baseline in these studies.

Intervention

This new review found five interventions involving changes to self-concept or self-esteem, with attainment, of some sort, as a dependent variable. None provide very strong evidence of a causal link. There were no interventions concerning participation.

Cohen *et al.* (2009) conducted a randomised field trial involving a writing assignment for students to produce an essay affirming their personal values, which was intended to boost their self-worth. A total of 175 African-American and 190 European-American pupils in seventh grade were randomised to the treatment and control groups. The overall gain in GPAs from seventh to eighth grade, for the four core academic subjects of science, social studies, maths and English was similar in both groups, suggesting that the intervention had little or no effect. However, the African-Americans in the treatment group improved their GPA by 0.24 points and low-achieving African-American students by 0.41. The latter, of course, represents only a minority of students (at the intersection of treatment group, low-achieving and African-American), and may be regression towards the mean (Jerrim and Vignoles, 2011). The intervention also appeared to reduce the likelihood of low-achieving African-American students being assigned to a remedial programme or retained in grade. The research described in this article is reported as consistent with What Works Clearing House evidence standards.

Good *et al.* (2003) examined a way to reduce the effects of stereotype threats to test performance. There is a widespread belief among children that maths is a more masculine subject, so girls face a stereotype threat that impedes their performance. The reverse is true for reading and literature. The intervention involved teaching children to cope with these purported stereotype threats (a cause of anxiety). Participants were 138 US seventh-grade pupils enrolled in a computer skills class in one school in a rural area with a high proportion of low-income families (about 70% of students qualified to receive free or reduced-cost lunches). Children were divided into three groups and assigned to a college student mentor. One group was encouraged to view intelligence as malleable, as suggested by the work of Forbes (1945), for example. The second were told to attribute academic difficulties faced during transition to junior high school to the novelty of the educational setting, and to discuss how they could overcome these difficulties. The third group discussed a combination of these issues. To reinforce these messages, students created web pages that advocated the experimental messages. A control group used the same time to discuss

the dangers of drug use. Achievement in maths and reading was measured by the standardised Texas Assessment of Academic Skills test. In all three treatment groups there was no gender gap in maths, but there was in the control, and maths scores were higher in the treatment groups for girls. Results were less clear for reading scores, and the gender gap did not disappear. The number of cases is small, especially because each group is also divided into boys and girls (around 17 cases per cell). It is not clear how the groups were matched, or indeed if they were, at the outset. Mentors may have given additional substantive assistance in school subjects, as their work was not monitored.

Gordon *et al.* (2009) evaluated the Benjamin E. Mays Institute's (BEMI) mentoring programme for academic identification, and its effect on academic performance. The intervention was based on the concept that pupils who identify themselves with academics are more likely to perform academically as their self-esteem is related to academic success (Osborne, 1997). The main goal of the BEMI programme was to develop the intellectual, physical and social aspects of students through role modelling and mentoring, providing black males with positive role models. Instructions in four core subjects (maths, English, science and history) were delivered by male instructors. Once a week, students dressed in business attire and hosted business and community leaders who gave instructions in their area of expertise and discussed the rewards and benefits of their jobs. Mentors and mentees met weekly and parents also had a monthly meeting with the mentoring team. At the end of the year, students who had completed all components made a presentation at a conference. Sixty-one black male eighth-grade pupils in the US were divided into a single-sex treatment (29) and a control taught in mixed-sex settings (32). The intervention group was selected as those who had repeated a grade but expressed a desire to do well academically, who were labelled as at-risk and who displayed positive attributes like cooperation, determination, focus, appropriate behaviour, consistent attendance and positive problem-solving approach, as well as a willingness to participate in at least two hours per month of community activities. Participation was optional. The treatment group made slightly greater gains in maths and reading. The sample size was small. There could easily be volunteer bias and the cases were not assigned randomly so the authors are in error when using significance tests to judge differences. Since the intervention involved substantive teaching, it is not clear that academic identification is a causal intermediary.

Oyserman *et al.* (2006) studied a US School-to-Jobs intervention, based on the idea that individuals have internal 'academic possible selves', but that these are insufficient for success unless they are linked with plausible strategies, and made to feel like 'true' selves. The goals of the intervention were, reportedly, to help students develop possible selves, provide them with the strategies to attain these, and insulate them against feared 'off-track selves'. Feared off-track selves referred to delinquent behaviour, such as involvement in gangs or violence (30% of responses), drugs (30%), delinquency or involvement with the police (30%) and becoming pregnant and other 'status' offenses. It was expected that, in the long term, the behaviour relevant to academic possible selves (e.g. doing homework) would increase, while behaviour undermining possible selves (e.g. misbehaving in class) would decrease. Consequently, such self-regulatory behaviour would lead to better academic outcomes and GPAs. The intervention consisted of eleven sessions plus two follow-up sessions to help pupils extend their possible selves to outside the school. A total of 264 low-income middle school African-American and Latino students were randomly assigned to an experimental (141) or control group (123). Self-regulatory behaviour included time spent doing homework, disruptive behaviour and absences, and was measured using self-reported open-ended questions like: 'How many hours a week do you spend doing your homework?' and 'How often does the teacher make you leave the classroom because of your behaviour?' Academic outcomes were measured using GPAs in four core subjects and the Essential Skills Attainment Test at the end of eighth and ninth grade. The study concluded that the intervention had direct positive effects on possible selves as well as a direct negative effect on school absences (reducing absences). Intervention youth had more possible selves and were better able to use them to improve behavioural self-regulation. Changes in possible selves predicted change in behavioural self-regulation – going to rather than skipping school, behaving well and participating in class, and spending time on homework. Self-regulation improved academic outcomes

and reduced risk of depression. Intervention effect sizes on attainment (GPA) by the end of ninth grade were 'small-to-moderate'.

Oyserman *et al.* (2007) reported a further evaluation of the School-to-Jobs intervention, based on improving academic possible selves (see above). This time the aim was to investigate the extent to which an intervention that enhances young people's possible selves can buffer the negative effect of low parent-school involvement. A total of 239 eighth-grade students in three low-income middle schools were randomly assigned to experimental (131) and control (108) groups. The experimental group received the School-to-Jobs intervention for seven weeks. Twice weekly, School-to-Jobs students attended small group-based, in-school sessions followed by two parent-youth sessions. Some students were expelled or suspended in the first month of school and so did not receive School-to-Jobs intervention. Later sessions focused on strategies to attain possible selves and to cope with difficulties they may encounter. Parental involvement was measured using self-reported questionnaires including questions like: 'Do you ... attend parent/teacher conferences', ' ... belong to or attend meetings of the parent-teacher organization', ' ... talk with parents of other children to plan or organize activities for your child', ' ... belong to other school-based organizations with parents from your child's school', and ' ... act as volunteer at the school'. Baseline grades were based on students' self-reports, because school records for the previous year were not available. Student in-class behaviour was based on teacher ratings. School grades in the ninth year for maths, science, history and English were taken from school records. In the control group, parental involvement had a positive effect on GPA and on teacher-rated behaviour. In the intervention group, parent-school involvement had no effect. Students in the intervention group had higher GPAs and better teacher-rated behaviour than those in the control group when parent-school involvement was less than the average. The authors interpret this to mean that the intervention reduces the impact of low parent-school involvement. This is a complex chain of logic, which is probably more than the study can sustain. The analysis was not conducted as intention to treat, and only those who received a 'meaningful dose' of the intervention (defined as attendance at five or more sessions) were used. This means that the two groups already differed substantially by age, prior behaviour and reported academic outcomes.

In summary, there are problems with and ambiguities about the nature of all of these studies. Nevertheless, there are slight indications that it may be possible to improve attainment through an intervention that enhances self-esteem or academic self-concept.

Mechanism

Researchers have distinguished between two main categories of self-belief in relation to their attainment at school. The first of these (self-esteem or self-concept) is assessed through items that begin 'I am ...'. The second of these (self-efficacy) is assessed through items that begin 'I can...'. This section reviews research on self-concepts and the next section reviews research on self-efficacy. The research on self-concept distinguishes between self-esteem (a measure of global self-concept) and academic self-concept as a measure of self-concept in relation to schooling. Thus, items such as: 'I am just not good at Mathematics,' have been used (Eccles and Wigfield, 1995) to assess students' academic self-concept in relation to mathematics. The idea underlying these constructs is that learning takes place in a social context and learners' readiness to persevere in learning is affected by how they regard themselves within that social context.

The prediction that children from poor families will have lower self-esteem rests on a belief that their frame of reference goes beyond their immediate social or family environment and that they will perceive themselves as disadvantaged. This could be a consequence of attending school in a more privileged area, or experience of treatment at school or beyond and subsequently. The prediction that children from poor families are likely to have a lower academic self-concept rests on a belief that they will experience dissonance between their experience of school and home, which will then be compounded in subsequent interactions with teachers. That is, the theory appears to predict that this effect will become embedded in children's early experience of school.

A key difficulty in the empirical analysis of this perspective is that the theory proposes that self-concepts and attainment are mutually dependent. This provides scope for finding evidence that contradicts the theory (if attainment rises and there is no subsequent rise in self-concept or if self-concept rises with no subsequent rise in attainment). However, if both self-concept and attainment rise, we cannot then infer that attainment is rising because self-concept has risen. It is difficult to see a way out of this problem. For example, it might be argued that 'persistence on task' is an intermediate variable between self-efficacy and attainment, but it could equally be argued that it is an intermediate variable between attainment and self-efficacy. Despite the positive attributes of longitudinal and structural equation modelling the authors are not able to overcome this difficulty.

Conclusion

Possible reasons for the inconsistent results in this section could be that studies used different instruments for measuring self-concepts, and the questions asked were not comparable, and may even have been measuring different constructs (or, indeed, nothing at all). They also used different indicators of achievement, such as standardised tests or teacher ratings. However, the single biggest difference lies in the use of contextual and possible confounding variables. The more and better these additional measures, the less association is found between self-concepts and school outcomes. It is also possible that academic self-concept and academic performance are measuring nearly the same thing. This is especially so where one's academic self-concept is based on other people's opinion about one's academic performance. For example, Roeser and Eccles (1998) found that the more teachers thought an individual was a good pupil the more that pupil was likely to value school. Similarly, Bauemister *et al.* (2003, p. 7) suggested:

People score high in self-esteem because they respond to a questionnaire by endorsing favorable statements about themselves. The habit of speaking well of oneself does not abruptly cease when the respondent turns from the self-esteem scale to the questionnaire asking for self-report of other behaviors. People who like to describe themselves in glowing terms will be inclined to report that they get along well with others, are physically attractive, do well in school and work, refrain from undesirable actions, and the like. That is how they get high scores in self-esteem, but researchers may easily mistake this identical tendency as evidence that self-esteem predicts or even causes a broad range of positive outcomes.

Whilst the proposed definition of self-constructs has been sharpened by research in this field, the accumulated evidence is, as yet, unclear. There are also important areas (such as evidence from studies of younger children in school) where the quantity of evidence is still very small. Therefore, at this time, the review must conclude that a full causal model has not yet been established. However, there is sufficient promise here to justify work, carefully designed to trial interventions that can separate the impact of self-concept from all else. There is little point in conducting more longitudinal studies as such, since these will be unable to resolve the central issue of the sequence.

Individual self-efficacy/locus of control

Goodman and Gregg (2010) pointed out that, to their knowledge, the influence of locus of control or self-efficacy on educational outcomes has not been tested. They reported that mother's locus of control is related to their SES background but did not say whether this is also true for children's locus of control. They did state they had identified children's locus of control as an important factor in attainment. By locus of control they meant that a child has 'strong beliefs in his or her own ability', that 'school results are important' (dealt with in the section of this chapter on attitudes), and 'believes that his or her own actions

make a difference and that he or she can control events that affect him or her'. And they claimed 'even after accounting for long-run family background factors and prior attainment, children are more likely to perform well in tests' if they have this locus of control. What does the evidence say about whether this is a causal link?

Association

This new review found a few studies that showed a correlation between young peoples' reports of an internal locus of control or high self-efficacy, and their school attainment (e.g. Schulz, 2005 and Speight, 2010). Da (2005) used a questionnaire survey of 213 junior school students to show an association between English self-efficacy, anxiety, learning strategies and academic achievement.

Hejazi *et al.* (2009) involved 400 US high school students, selected through cluster random sampling, who completed the Revised Identity Styles Inventory and Morgan-Jink Student Efficacy Scales. In general, the results indicated that an informational identity style was positively related to academic achievement, while a diffuse/avoidance identity style was negatively related. The authors propose that the personality style is the cause of the attainment, through the mediation of academic self-efficacy. However, there are now several hypothetical concepts in such a chain of reasoning.

Anderson *et al.* (2005), in New Zealand, found a link between locus of control and prior School Certificate results, and there were interactions with the type of school attended and student motivation. Given that the study involved only 215 year-twelve students in a non-random sample, and the authors assess the link erroneously in terms of statistical significance, it is hard for the findings to be clear.

Although the evidence is sparse and neither high quality nor large-scale, there is perhaps sufficient here for a *prima facie* case of a causal model.

Sequence of events

This new review found four further studies linking self-efficacy/locus of control in a plausible sequence and two suggesting that there is no sequence.

Zimmerman *et al.* (1992) involved 102 students (12% refusal or dropout) in eighth and ninth grade in two US high schools. Five teachers across these two schools agreed to use one of their classes, apparently selected randomly from their set of classes, but the paper does not describe how nor how many classes each teacher had. The sample of students completed two bespoke self-efficacy scales (for self-regulated learning and academic achievement), gave an indication of the final grades they were expecting and that would satisfy them; their parents were asked the same questions about grades of their children, and the researchers also had the prior and final teacher-assessed academic grades in social studies for each student. The highest correlation in the data was between student grade goals and their final grades (0.52). The correlation between student prior and final grades was only 0.23. This is evidence of an association but not for what the author claimed, which is that students' 'beliefs in their efficacy for self-regulated learning *influenced* ... their final academic achievement' (p. 663, emphasis added).

A further study of the same type suggested that self-efficacy led to individual's aspirations and later career trajectories (Bandura *et al.*, 2001). And one study used path analysis to suggest a link from goal setting, self-efficacy and prior performance to final achievement of high school students in Iran (Yailagh, 2003). One longitudinal study was explicitly concerned with higher education. In the US, Gifford *et al.* (2006) reported that prior ACT scores and locus of control were both associated with university students' subsequent academic results. Students who entered university with lower scores on the locus of control scale (internals) obtained significantly higher GPAs than those who scored higher (externals) on this same scale.

However, as discussed in the section in this chapter on self-concept, Tang (2004) presented strong evidence that once other measures such as prior achievement were accounted for, then locus of control

was not linked to subsequent attainment. Also, Grabowski *et al.* (2001) found evidence that global self-efficacy was not related to subsequent attainment.

The evidence for a sequence is limited and inconclusive. It is as likely that educational outcomes lead to self-efficacy/locus of control as the reverse.

Intervention

Four interventions were found that related to alterations in self-efficacy or locus of control and subsequent attainment. There were no studies relating to participation. Together, these studies provide very weak evidence of an impact from self-efficacy.

Hughes *et al.* (2006) conducted an intervention (It's Up to Me (IUTM)) aimed at developing students' self-perceptions, academic self-efficacies and academic performance. It involved the year-six pupils in twelve UK primary schools, six of which were given the intervention and six used as a control. How cases were selected and allocated is not clear. Psychometric tests (general self-efficacy, subject specific self-efficacy, self-esteem and academic motivation) were administered as measures of self-concept just before the IUTM programme and seven months later. The intervention had no effect on self-perception and self-motivation, and a small effect on self-efficacy. Intervention schools had higher Key Stage 2 scores, after controlling for Key Stage 1 scores. However, this improvement was isolated to pupils with special educational needs, who may have felt better about themselves because of the attention given to them as a result of the trial. Effect sizes, where they existed, were small.

Perry (2003) reported an intervention to enhance students' academic control, to redress failure, based on laboratory and longitudinal field studies conducted at the University of Manitoba over 20 years. The intervention involved a simulated classroom situation where the researcher gave students falsified performance feedback on an achievement test and so manipulated their academic control directly. This is representative of various achievement tasks found in actual classrooms that can make students feel in or out of control academically. The author claimed that differences between students in their sense of academic control can affect subsequent motivation and achievement performance, even though it is illusory.

Blackwell *et al.* (2007) examined the academic trajectories of learners with different implicit theories of intelligence and other achievement-related beliefs. Using four cohorts of pupils (373) as they progressed from seventh to eighth grade in one public school in New York, academic achievement was measured using a standardised maths test, the Citywide Achievement Test. Motivation was assessed using a questionnaire containing items that included implicit theories of intelligence, goal orientation, beliefs about effort and attributions and strategies in response to failure. The study showed that students who thought their intelligence was malleable and could be developed were more likely to believe that working hard was necessary and effective in raising achievement, than students who thought that intelligence was fixed. At the beginning of junior high school, and controlling for prior achievement, these pupils outperformed in maths those who held to the fixed-intelligence theory. This is evidence of an association but not yet of an intervention. Blackwell *et al.* (2007) then used an intervention to teach half of the 99 seventh-grade students in a second school the belief that intelligence is malleable. Only 95 of these elected to participate, and five were excluded from the study because they were not able to attend the sessions regularly. Students were randomly assigned to experimental (48) and control groups (43). The author does not explain the discrepancy of one case in the report. Sixth and seventh grade maths scores were used as measures of achievement. The intervention was eight 25-minute sessions (one per week). Students in the experimental group were taught that intelligence was malleable and can be developed. Undergraduate assistants trained in incremental theory were recruited as mentors to teach the motivational intervention workshops. There was a slight gain in achievement for the experimental group, especially those who had not believed in malleable intelligence at the outset. This is a very small sample, and the report is missing key information in places (such as when the initial assessments took place).

Miles (2010) used a controlled, pre- and post-test design study to test the effects of a 'mastery goal approach' to mathematics instruction on the performance of eighth-grade students. Seventy-nine students took part. It is not clear if the allocation to control and treatment group was randomised. The indicator of academic achievement was the STAR Math assessment. Students' motivation was measured using the Motivational Orientation Inventory. A pre- and post-test was conducted on 57 students (and it is unclear why only these were tested) to determine if there were any changes to students' motivation, perceptions of classroom goal structures, and academic efficacy as a result of the treatment (mastery goal approach to instruction). The report suggests that the mastery goal approach to instruction brought about a positive change in students' motivation and achievement. The study did not provide evidence of the causal direction. There is no evidence that the enhanced motivation led to higher achievement. The mastery approach involved individualised pacing of instruction to meet the needs of the students, intensive remediation and retesting of standards and mastery of materials. It is possible that such intensive instruction leads to success in testing, which in turn, leads to higher motivation and self-efficacy.

These four interventions form a strange combination of approaches, generally with older students, on a small scale and with far from convincing results.

Mechanism

In relation to school attainment, the idea of 'locus of control' is generally used to refer to a child's belief in their capacity to affect their progress in school. Conceptually it is close to the idea of 'academic self-concept' (dealt with in a separate section earlier in this chapter), but it is assessed through statements that begin 'I can' rather than 'I am'. 'Locus of control' may be predicted as a mediating variable between poverty and attainment if children from poor households are less likely to develop a belief in their ability to achieve in school. In these circumstances, they may be less likely to persevere when facing problems. The idea of 'self-efficacy' relates to specific tasks. Students may be asked to respond to statements such as: 'I can calculate percentages.' It is therefore most obviously applicable in analysing children's performance on one kind of a task compared to another and is, therefore, less easy to relate to initial variation by social class background. That is, a credible theory of self-efficacy as a mediating variable between poverty and attainment has to provide a rationale for why children from poor households are likely to be relatively weaker at one kind of task than another. There is also obviously a danger of tautology in any analysis that seeks to correlate two self-reports of competence (such as 'I can do maths', and 'I have passed GCSE maths'). Locus of control and self-efficacy are both hypothesised as 'reciprocal mechanisms' in which achievement is expected to enhance belief in one's ability to perform a task and this belief is expected to sustain motivation in attempting tasks. As such, research on these constructs faces the same difficulties in testing as noted in the case of self-concept.

Conclusion

There is little solid evidence that either self-efficacy or locus of control can influence attainment or educational participation. It is certainly not true to say, as You *et al.* (2011, p. 253) did, that it is 'well established that perceived control plays an important role in student academic achievement'. At present, anyone with a sole concern to improve educational outcomes for those most at risk of underperformance would be strongly advised to seek an intervention elsewhere. However, there are some indications here that might be worth pursuing, perhaps starting again at the very beginning and testing the contextualised association between self-efficacy and educational outcomes, and looking for evidence of the sequence from one to the other.

A problem here is that the meaning and utility of these concepts is unclear, even if the association is accepted. One of the problems faced in this review was the interlinked nature of aspirations, attitudes and behaviours with each other and with SES background factors. This is standard in explanatory

social science. However, the problem was compounded by the theoretical fragmentation of many of the supposedly explanatory concepts. Are self-esteem and self-concept the same or different, or is one a component of another? Once authors start to break these items down and have ten or more different kinds of self-concepts, which can be both causes and effects in the same model, then the theory becomes just about untestable. One very useful way forward in this area would be for the theorists to convert their concepts into specific and testable propositions, setting a plausible context and conditions, and then encouraging independent researchers to try and falsify them. The key is that the advocates must agree to success and failure criteria beforehand.

It could be anti-educational and perhaps rather dangerous to create an intervention that made more young people falsely believe that their future was under their control to a large extent. It may be that the world is not actually under their, or indeed anyone's, control (Gorard 2002a). Or, the difference between the two types of young people could be genuine, in the sense that the internal locus group may have learnt that they can control some things and the external locus group have learnt that they cannot. In this case, merely giving the second group more confidence, affecting their locus of control artificially, could be useless or worse. What would be needed, under these conditions, would be greater competence to control their world – including presumably the pace, style and content of their learning. In that case, differential competence could be the cause both of differences in attainment and in a genuine improvement in locus of control. Self-efficacy or a belief in one's own competence is very similar to locus of control, and faces similar problems. Where the real underlying difference is *actual* competence, such that differences in beliefs about competence are largely justified, then it is competence and not self-efficacy that needs to be altered through any intervention. Simply making people believe that they are more competent than they actually are may be ineffective or worse. But then making people more competent at gaining positive school outcomes and so also making them more confident, is almost the same as simply improving their school outcomes. Self-efficacy by itself could be a red herring.

7 Child behaviour

This chapter completes the review by summarising the evidence on the effect of young people's behaviour on educational outcomes. The four sections cover participation in extra-curricular activities (ECA), paid work while at school, poor behaviour and early substance abuse. None has sufficient evidence for a complete causal model.

Individual extra-curricular activities

Goodman and Gregg (2010) suggested that young people from poorer families are less likely to engage in activities like playing musical instruments or formal sports. They also suggest that the Extended Schools Services programme run by local councils in England, and including opportunities to play sports and participate in arts and music, may yield benefits for attainment (citing Cummings *et al.* 2007). However, they also note that any association between ECA and GCSE attainment disappears once prior attainment is controlled for. This might mean that the benefits of positive activities are already included in the prior attainment. Or it might mean that ECA has no direct association with attainment but only with those likely to be higher attainers anyway.

Association

This new review found several studies reporting a weak association between individual participation in ECA, including sports, and school attainment. All related only to the secondary phase. None dealt with subsequent participation in education.

Shulruf *et al.* (2008) considered 555 students in year nine from one suburban high school in Auckland. They showed a correlation between students' participation in ECA and their academic outcomes and attitudes towards literacy and numeracy. Using all available predictors, including participation in ECA, the best regression model had only 13% to 15% common variance with school attainment (subject scores). Prior attainment explains around 9% alone, and playing team sports less than 2%. Much data was missing, and the authors erroneously used significance testing with what is clearly population data.

Lipscomb (2007) used US National Education Longitudinal Study (NELS) data for grades eight to twelve, and found no socio-economic variation in the relationship between participation in ECA and grades. There was a weak positive association for all students.

Kantomaa *et al.* (2010) looked at the related issue of physical activity and overall academic performance and future educational plans of adolescents aged 15 to 16. They used a sample of 7,002 from the Northern Finland Birth Cohort 1986, and collected data by post in 2001–02. More elevated parental SES, fewer behavioural problems, better mental health and higher levels of physical activity were all slightly associated with self-reported academic attainment and future educational plans. See also Stevens *et al.* (2008).

There is, therefore, a weak *prima facie* case to investigate a causal link, even though the levels of association reported are low enough to be easily explicable by insufficient contextual and confounding variables (such that those participating in ECA were already different at the outset).

Sequence of events

The review found three full longitudinal studies on this topic, which were small or of poor quality. They generally show the same picture as the associative studies. There is a very weak link between ECA and attainment (and college attendance in one example) and the sequence is correct for a causal model.

Vandell *et al.* (2007) looked at 35 after-school programmes in eight US states, following 3,000 low-income, ethnically diverse elementary and middle-school pupils. The study reported that students who regularly participated in high-quality after-school programmes had higher standardised maths test scores and better behavioural outcomes than students who regularly spent after-school time without adult supervision. However, data was collected for only 2,300 pupils, from teacher and student surveys and school records. Also, the authors did not provide evidence that their groups were initially equivalent. The reported differences between the groups might easily reflect pre-programme differences in their behaviour or academic performance.

Kaufman and Gabler (2004) used NELS data to assess the relationship between participation in various ECA and students' subsequent probability of going on to a four-year college or university course. They concluded that participation in extra-curricular cultural activities has different 'causal' effects on college-bound and elite college-bound student populations. At the general college level, hands-on training in the arts appears to improve students' odds of going to college by bolstering what the authors refer to as 'human capital' but not by increasing 'cultural capital'. Direct exposure to the arts does not appear to improve students' chances of going to an elite or heavily selective college, though having parents interested in the arts does. At the elite college level, for example, participation in yearbook/school newspaper activities appears to benefit boys but not girls, though more girls report participating in this activity than boys. Thus, it may be that elite colleges do not simply seek students with high cultural capital but those who stand out, defy expectations, or are otherwise unique among their peers. On the other hand, the authors find little reason to believe that students can actually be taught or trained in the types of cultural competence valued by elite college admissions offices anyway.

Martin *et al.* (2007) involved 33 African-American students who had been expelled or suspended from school at least once, aged 13 to 17. The study took place in an alternative school in a city school district of Ohio with high rates of poverty, low parental involvement and lack of funding. There was a high rate of absenteeism or truancy and referrals and low graduation rates among participants. Students attended an after-school programme for three hours a week, five days a week. It involved tutoring, group counselling, social skills training and various enrichment activities. Behaviour was assessed using attendance, discipline referrals, suspensions and expulsions reports. Their academic performance in maths and reading were assessed using the Kaufman Test of Educational Achievement (KTEA). The study also assessed students' intelligence based on verbal and non-verbal abilities using the Kaufman Brief Intelligence Test. Prior to the intervention, student achievement was negative and every student was two grade levels behind their peers (those not on the programme). After intervention, participants were performing at their appropriate grade level. Their average improvement in basic skills was by at least two grade levels. The study was small, and had no control group, and could reflect regression towards the mean.

The review also found a few studies on the lack of a link between watching television and attainment (dealt with here for convenience, as there is insufficient on this topic to warrant a section on its own). Ennemoser (2003) presented a longitudinal study of the effects of television on academic achievement. Results suggest that, although there is some evidence for a causal relationship between television and achievement in language and reading, the underlying mechanism of the television effect remains unclear. Heavy viewing of entertainment programmes may be disadvantageous for children with poor intellectual abilities or who come from families with low socio-economic status (SES). Educational programmes, on the other hand, have a slightly positive influence on later language and reading abilities. Munasib and Bhattacharya (2010), anyway, report that any link between watching television and school outcomes disappears when appropriate controls and contextual variables are added.

There is no solid evidence in this section that could not be explained by an initial bias in the groups in the first two studies. The third study is too small to be given much weight. It is ethnically and culturally specific, and the approach involves generic teaching and so is about more than after-school activities, making it hard to untangle cause and effect. The evidence seems to show that watching television does not lead to changes in generic educational outcomes. There is no *prima facie* case for a causal model linking television or any other out-of-class activities and school outcomes.

Intervention

This new review found one intervention study of an after-school programme, but none of ECA as more traditionally conceived.

Goerge *et al.* (2007) carried out an evaluation of an after-school programme in Chicago. The intervention included paid internships in a range of professions and organisations for young adults in high schools with a high risk of pupils dropping out before the age of 18. Attendance at school was a requirement for participation in the scheme. A total of 20,370 pupils in 24 schools in 2003 were included in the analysis, 17,099 who did not participate in the programme, 1,982 who were invited but did not participate, and 1,289 participants. These participants were not selected randomly, and already had better attendance records and fewer course failures than non-participants, on average. The results showed that those who were on the programme for longest and who participated at the highest levels tended to fail fewer core subjects (English, maths, science and social studies), and had the highest average rates of graduation and lowest dropout rates. However, despite some attempts to control for initial and subsequent differences, this cannot be construed as good evidence that the programme caused these differences. An intention to treat analysis (see Chapter 5) or a true experiment might yield very different results.

This intervention can be easily explained as a mismatch in the original groups, and it may not be directly relevant to ECA or sports participation anyway.

Mechanism

There are several possible mechanisms. First, children who participate in ECA may benefit from additional instruction. In this case, it would have to be shown that the experience of ECA was relevant to academic assessments. This explanation is reinforced by the indications that participation in sports within schools is more strongly related to traditional school outcomes than other leisure activities outside schools. ECA may simply be more teaching. Second, ECA might provide children with an enriched cultural experience, helping them to understand and interpret teachers' expectations and communication. These first two proposed mechanisms suggest that additional resources and activities are needed in school to redress disadvantages in students' upbringing. Third, ECA may lead students to develop a stronger identification with the school, affecting their academic self-concept. In this case, such effects should be observable in measures of self-concept or locus of control as discussed in previous chapter. This proposed mechanism suggests that the problem to be addressed is one of mutual understanding and identification. However, given the lack of evidence at each stage of the model, establishing the explanation is not a top priority.

Conclusion

It is notoriously difficult to demonstrate the absence of something, especially from such a wide-ranging but inevitably partial search. This is why social science adopts a principle of parsimony or simplicity, meaning that the explanation must not make any assumptions for which there is no clear evidence unless no other explanation is possible. Nevertheless, the conclusion of this review has to be that there is no evidence for a causal link from extra-curricular participation, *per se*, to improved educational outcomes. This is not to suggest that ECA, sports and after-school activities do not have other benefits or that evidence of improved

attainment will not be found in the future. But at present, anyone with a sole concern to improve educational outcomes for those most at risk of underperformance would be advised to seek an intervention elsewhere.

Individual paid work

Goodman and Gregg (2010) did not mention paid work undertaken while studying, and so this new review started from a position of no evidence of an association between paid work and educational outcomes. There is a considerable literature about what is termed 'work intensity' (how many hours paid work they do per week) among young learners. But the search yielded no studies of the influence of parental work patterns on their child's school success other than associations between SES and attainment.

Association

This new review found a few studies suggesting a weak association between work intensity and poorer educational outcomes.

Post and Pong (2000), using data from the Trends in International Mathematics and Science Study (TIMSS), showed an association between the hours of paid work done by pupils in middle schools and lower contextualised school grades. See also Sy (2006), Staff and Mortimer (2007) and Staff *et al.* (2009) on the links between work intensity and education.

Sequence of events

The review found two full longitudinal studies on this topic, which largely disagree with each other in their findings. One suggests that the more hours a young person does paid work while in compulsory schooling, the weaker their academic results will be (in maths and science at least). The other suggests that there is no difference in the level of education achieved for any number of hours paid work up to and including 15 hours per week.

Singh and Ozturk (2000) used data from the first and second follow-up of NELS. Sampling was stratified in terms of school type, region, urbanicity and minority enrolment; and 26 students were randomly selected from each of the 1,057 schools. The same cohort of students was followed when they were in grade ten (age 15/16) and grade twelve (age 17/18). Outcome variables were coursework in maths and science measured as the total Carnegie units completed during high school. Background variables were SES and prior achievement in maths and science. The study explored the effect of number of hours worked during high school on the number of courses taken in maths and science and on twelfth grade achievement. In general, the more hours students worked, the smaller the number of maths/science courses completed, which is associated with subsequent lower achievement in maths/science (after controlling for SES and prior achievement).

Bachman *et al.* (2011) used longitudinal data from the Monitoring the Future project in the US, spanning a total of three decades to examine whether work intensity makes a causal contribution to later educational attainment and substance abuse. One dataset tracks eighth graders for eight years (modal ages 14 to 22) and provides extensive controls for possible prior causes; the second, larger dataset tracks twelfth graders for up to twelve years (to modal ages 29 to 30) and permits assessment of possible short-term and longer-term consequences. Work intensity was measured by the number of hours of paid or unpaid work per week. Control variables included individual characteristics (e.g. race/ethnicity, family structure, parents' educational level, mother's employment status), college plans, truancy report, self-rating versus peer rating of intelligence and school ability. Outcome measures included educational attainment (years of schooling completed, degrees attained), substance use (frequency of cigarette use in the past 30 days, of marijuana use in the past twelve months, of cocaine use and heavy drinking). Findings

based on propensity score matching and multivariate regression analyses were highly consistent across the two sets of data. There was no difference in college attainment at the ages of 21 to 22 and 29 to 30 for students who worked one to five, six to ten or eleven to fifteen hours in twelfth grade. There was an association between lower grades and working more than 15 hours per week. Further regression analyses suggested that the effect of twelfth grade work intensity on later educational attainment was not through lower expectations or other prior and more fundamental causes. Rather, the effects may be through diminished incentives and opportunities for higher education that accumulate with continued long working hours. Propensity scores can only adjust for covariates that were included in the estimation and so cannot entirely rule out unobserved characteristics.

There is overall slight evidence that lower attainment follows too much paid work while still at school and this evidence is in the correct sequence for a causal model.

Intervention

This new review found no reports of controlled interventions to improve educational outcomes by adjusting work intensity.

Mechanism

There are several plausible mechanisms here, if they are needed. Perhaps most simply, it may be that the poorest students are under the greatest pressure to work for money while still at school, and that 15 hours or more per week replaces something that more academically successful children do. It might also influence attendance, lateness, extra-curricular participation, homework or just tiredness.

Conclusion

On balance, and despite the absence of evidence from any interventions, there is perhaps just enough to persevere with research on this topic. There is slight evidence of association, likely sequence and some plausible mechanisms. Interventions could be devised to try and reduce work intensity for those most at risk of underperformance in a trial design and monitor any differences in results.

Individual poor behaviour

There are a number of behavioural intervention studies that aim to improve children's behaviour and thus school outcomes. Many of these interventions target children with severe emotional and behavioural difficulties, and are therefore outside the remit of this new review. Also, the main outcome of most of these studies was students' behaviour, rather than their academic achievement. Any effect on academic achievement appears to be incidental, such as a result of improvement in the school learning environment by increasing the amount of time students are in school, or the proportion of time classrooms are engaged in instruction. As Horner *et al.* (2009) said, 'focusing on social behaviour is not expected to improve academic outcomes, but improving social behaviour of students *combined* with effective curriculum and instruction is expected to result in better outcomes' (p. 140, emphasis added).

Some other individual behaviours such as work intensity, ECA and substance abuse are dealt with in separate sections of this chapter, where a synthesis is attempted of a number of studies on similar topics. In addition to these, this new review found a number of rather isolated studies relevant to poor learner behaviour. These included counselling and an intervention to promote positive behaviour.

Of the various forms of individual behaviour discussed in this section, Goodman and Gregg (2010) mentioned evidence on attendance at school as an outcome in itself, but not as a behaviour leading to

attainment. They do not mention loneliness at school. They said that poorer children have more frequent 'peer problems' but presented no explicit evidence to link this to school outcomes. Goodman and Gregg (2010) did not mention counselling for behaviour problems. They discussed behaviour as an outcome, and suggested that antisocial behaviour is 'socially graded' and that risky behaviour could influence an individual's educational trajectory. Some risky behaviour such as substance abuse is dealt with in separate sections of this chapter.

Associations

This new review found three further possibly helpful associations between behaviour and educational outcomes.

Shin (2007) proposed that loneliness and peer relationships could be associated with poor performance at school. Vitaro *et al.* (2005) reported that poor behaviour (classroom indiscipline) and lower attainment at school were related. Crede *et al.* (2010) found that attendance in class was the strongest single correlate of grades for US college students.

Sequence of events

Very little evidence was found of a sequence from poor behaviour to educational outcomes, other than what has been covered elsewhere in this review.

Fantuzzo *et al.* (2003) showed that problems with emotional and behavioural adjustment at the start of the preschool year were associated with later disengagement, poor emergent literacy and classroom learning outcomes. This issue is discussed in the section on parental behaviour and involvement in Chapter 5.

There are some indications that after-school clubs and enrichment activities can improve pupil behaviour and so lead to improved school outcomes. However, the quality of evidence is very mixed (see separate section in this chapter on extra-curricular activities).

Intervention

Despite the weakness of the evidence for an association or sequence, the review found seven further reports of intervention studies of relevance to individual poor behaviour. One shows little evidence of a link from an intervention to enhance social and emotional skills leading to attainment and this little evidence could be regression towards the mean. Another shows that the level of funding available for counselling deprived children is unrelated to their attainment. The remaining five all concern school-based initiatives to reduce poor behaviour and they suggest that such interventions can result in gains in attainment.

A review of research on the impact of social and emotional learning programmes on elementary and middle-school students in the US looked at 317 studies and involved 324,303 children (Payton *et al.*, 2008). It suggested that such programmes are generally effective and can improve school engagement, classroom behaviour and academic performance. The report recommended that federal, state and local policies and practices encourage the broad implementation of well-designed, evidence-based interventions for school and beyond. This is powerful evidence but not always with a clear causal link from behaviour to attainment. Using a quasi-experiment, Gottfried (2010) suggested a positive link between attendance at schools and later attainment.

Jones *et al.* (2011) conducted a two-year experimental study of the impacts of a school-based intervention, the Social and Character Development Research Program, designed to enhance children's emotional and social skills, and to reduce aggression and promote positive behaviour. The intervention is a school-wide literacy and social-emotional learning programme (4Rs: reading, writing, respect and resolution). Teachers were trained to use the 4R curriculum (including a 25-hour introduction and ongoing

coaching). A total of 1,184 children in the third grade of 18 schools in New York City took part. Schools were matched in pairs and then randomised to treatment or control. Data were collected from teachers and children at four points in the spring and autumn of the third and fourth grade. The drop out/attrition rate averaged 8.6%. Behavioural outcomes were measured using a combination of teacher reports, child self-reports, a Home Interview Questionnaire and conventional behavioural assessment instruments (e.g. Normative Beliefs about Aggression Scale and Behavioural Assessment Symptoms for Children Questionnaire). Assessments of academic skills were based on teacher reports on items adapted from the Early Childhood Longitudinal Study, Kindergarten Cohort of 1998–2000 third-grade assessment. Maths and reading achievements were measured using the New York State standardised assessments of maths and reading achievement at the end of third and fourth grade. NYC Department of Education records provided data on school attendance. The only attainment effects were for those children identified at baseline by their teachers as being at highest behavioural risk. There were more general improvements in reports of aggression, attention, depression and socially competent behaviour. It is not clear that the attainment changes are the result of the changes in behaviour, as opposed to the direct teaching of literacy that took place.

Reback (2010) used regression discontinuity, of a kind, to estimate the effects of school counsellors and counselling on pupil behaviour, well-being and achievement. In the Alabama funding system there is a point in measures of school deprivation, like eligibility for free school lunches, where there is a sharp rise in the funding for counsellors. This study looks at differences in outcomes between elementary schools above and below this point for 1999/2000 to 2005/2006. The number of schools is apparently not specified in the report. The data came from school report cards which contain information on student enrolments, rates of student disciplinary incidents, attendance rates, the proportion of students eligible for free or reduced-cost school lunches and student performance on state-wide exams. These data were combined with National Centre for Education Statistics (NCES) annual Common Core of data. Data on the number of school counsellors were estimates based on schools' eligibility for subsidised staff positions rather than the actual numbers, as these were often not available or inaccurately reported. Test scores for maths, language arts and reading were based on the third- and fourth-grade mean scores on Stanford Achievement Tests. Estimated counsellor subsidies reduced the likelihood of some bad behaviour outcomes, including suspension and weapon-related incidents, but not drug-related incidents nor general classroom behaviour. There was no impact on attainment in tests.

Hawkins *et al.* (1999) undertook an evaluation of the outcomes of social competence training for children during the elementary grades on adolescent health-risk behaviours when aged 18, in Seattle. Of the fifth-grade students enrolled in participating schools, 643 (76%) were given written parental consent for the longitudinal study and 598 (93%) were followed up and interviewed at age 18. Self-reported poor and risky behaviour was lower than the control for students receiving the intervention and self-reported school achievement was higher.

A number of related studies used the US School-wide Positive Behaviour Support (SWPB) intervention, intended to deal with bad and risky behaviour at school. Horner *et al.* (2009) looked at primary schools in Hawaii and Illinois that used the programme over three years. There was a reduction in office discipline referrals and preliminary evidence of an improved proportion of third-grade students meeting the state reading standard. Bradshaw *et al.* (2010) looked at 37 elementary schools in a five-year randomised controlled trial of SWPB. Student suspensions and office discipline referrals declined. Pupils in fifth grade in these schools made very slightly greater gains since third grade in reading and maths than those in comparator schools. Lassen *et al.* (2006) found similar results with the same behavioural intervention in lower secondary schools in one inner city middle school in the US Midwest, over a three-year period.

Flay and Allred (2003) reported an evaluation of the Positive Action Program, an intervention to develop positive behaviour and improve achievement from US primary to high schools. It was designed to promote positive action, resulting in increased feelings of self-worth. Lessons on self-concept, positive actions, acting responsibly, getting along with others and being honest were delivered in 15-minute

segments every day. Of the 93 elementary schools that took part, 28 did not use positive action, 45 had used positive action for more than four years before 1998 and 20 used positive action and a combination of other programmes for the same outcomes. Data came mostly from the School Report Cards. Schools were also matched on percentage of pupils receiving free/reduced-cost lunch, ethnicity and student mobility, to create 20 matches of one of each type of school. Elementary school achievement was measured using mean scores on the Florida Reading Test and the fourth-grade Florida Comprehensive Aptitude Test for the 1997/98 school year. Behavioural data included discipline referrals for violent behaviour, out-of-school suspensions and over 21 days of unauthorised absences. Middle-school achievement was measured using the eighth-grade norm-referenced tests for reading and maths. School behavioural indicators were the incidents per 100 of students' substance use (tobacco, alcohol and illicit drugs), violence, 'dissing' behaviours (disrespect, disobedience, disorderliness and disruption), and property crimes (larceny, petty theft and vandalism). High-school achievement indicators were the percentage of tenth-grade students scoring three or greater on the Florida Writes test, the percentage of seniors passing the High School Competency Tests of communications and maths, mean Scholastic Aptitude Test scores and mean American College Testing composite scores. High-school behavioural indicators included referrals for substance use, violence, disrespectful behaviours, sexual offences, property crime, breaking of school rules, misbehaviour on or near school buses, parking violations and falsification of reports. Absenteeism data were also collected for all levels. At elementary level, violent behaviour and suspensions, but not absenteeism, were reduced by positive action. Children in positive action schools performed 45% better than children in matched control schools on the Florida Reading test, but no better on the aptitude test. These results largely carried forward to the middle schools attended by these pupils. The same direction of difference was also seen in the high schools attended by these pupils, but the size of the differences was small. No high school had more than 50% of students coming from an intervention elementary school.

Mechanism

As with many of the sections in this chapter, a number of explanatory mechanisms are possible to account for why poor behaviour would result in lower educational outcomes. Some of these, to do with self-esteem or self-efficacy for example, are dealt with in other sections of this report. Other explanations are simpler and could involve the direct influence of absences or classroom disruption on opportunities for learning. Attending school and working in orderly classes could easily be envisaged as leading to better attainment at school than non-attendance or disorderly classes. And an increase in orderly classes could have advantages for pupils other than those directly involved in changing their poor behaviour.

Conclusion

Some behavioural issues such as counselling for bad or risky behaviour, and mere attendance at school, generally do not have much evidence linking them causally to school outcomes, even though changes in any of these areas may be desirable for other reasons, or in their own right. The evidence on interventions to improve poor behaviour at school is somewhat more promising, and could be worth further attention and development. An important aspect of progress here, as with several attitudes, aspirations and behaviours in this report, is to untangle the impact of attention to poor behaviour from the impact of teaching styles and approaches adopted to deal with it.

Individual substance abuse

Goodman and Gregg (2010) mentioned substance abuse (heavy drinking, taking powerful or illegal drugs and, increasingly, smoking tobacco) as something that their datasets included, and as a characteristic

of families with what the authorities consider to be serious behavioural difficulties. However, Goodman and Gregg (2010) did not present any explicit evidence of an association between substance abuse and educational outcomes. What did this wider review find?

Association

One study suggested an association between early substance abuse and educational outcomes.

Legleye *et al.* (2010) conducted a representative cross-sectional survey of 29,393 teenagers aged 17 in France, asking retrospective questions. Early school dropout was associated with less elevated family SES, coming from a single-parent family, early grade repetition and daily tobacco smoking. Early daily cannabis and alcohol use (aged less than 14) was not related to attainment or dropout, but its later use was actually positively linked to school attainment, depending on the level of use. If valid, the latter findings may be more to do with pre-existing differences among drug users at that age rather than a direct influence of drug use.

Sequence of events

Three full longitudinal studies addressed this area. One, like Legleye *et al.* (2010) above, suggested that heavy drinking (alcohol) at an early age was unrelated to (or evenly positively associated with) participation and attainment for most pupils, except for working-class boys. The second and third studies both suggested that early cannabis use is linked to increased likelihood of dropout from education, and decreased likelihood of post-secondary participation.

Staff *et al.* (2008) used 9,107 cases from the National Child Development Study, a longitudinal birth cohort study of British children born in 1958, to examine whether heavy alcohol use from age 16 predicted lower educational qualifications by age 42. Although 12,006 cases remained by the time of their study, the author only included respondents for whom information on alcohol use at age 16, sex and father's occupation were available. Educational qualifications achieved by age 42 are based on the five-level categorisation of UK National Vocational Qualifications (NVQs). 'Heavy' alcohol use means four or more units of alcohol in the past week for females and five or more for males. Background variables were also included (standardised maths and reading test scores at age 11, teachers' reports of academic progress in relation to other children, and parents' ratings of their children's behavioural and emotional difficulties at ages 7 and 11). Other individual characteristics included students' future aspirations at age 11, students' reports of their social activities, artistic and musical interests and participation in school clubs and sports. The analysis used propensity score matching to balance groups of 'treated' and 'untreated' individuals on observed characteristics as a rough approximation to an experimental design. Matching is not as powerful in dealing with unobserved confounds as randomisation is. The measure of alcohol use was based only on a sample for one week, and the measure representing heavy drinking was actually quite low. Results showed that for girls, there was no association between heavy drinking and the chances of obtaining a degree. The same was also true for boys from middle class backgrounds. In fact, Schvaneveldt (2000) found that alcohol use was positively associated with educational attainment for Caucasian youth and those from higher SES backgrounds. However, Staff *et al.* (2008) found that boys from working class families who drank heavily were about 25% less likely to get a post-secondary degree.

Fergusson *et al.* (2003) used a 25-year longitudinal study of a birth cohort of 1,265 New Zealand children to examine the relationship between cannabis use in adolescence/young adulthood and levels of educational attainment. The sample size actually analysed ranged from 870 to 910 (69% to 72% of the initial cohort). Measures included frequency of cannabis use in adolescence and young adulthood (from age 15 to 25), levels of educational achievement up to 25 years (leaving school without qualifications, enrolment in university and attaining a university degree), plus social, family and individual characteristics, such as mothers' age at the child's birth, mothers' education, family SES, family functioning (changes of parents, childhood sexual and physical abuse, parental attachment), parental adjustment (parents' criminality,

alcohol and illicit drug use), sex, conduct problems (at age 15), cigarette smoking, novelty-seeking behaviour and deviant peer affiliations (all at age 16), and prior educational achievement and childhood cognitive ability (at age 8). Frequency of cannabis use was measured using four levels of categorisation: never, one to nine times, between 10 and 99 times, or more, by age 16. Reported greater cannabis use was associated with higher subsequent risks of leaving school without qualifications, failure to enter university and failure to obtain a university degree. The association between reported cannabis use and leaving school without qualifications persisted after control for confounding factors. The authors suggested it was likely that the results reflect the effects of the social context within which cannabis is used rather than any direct effect of cannabis on cognitive ability. When due allowance was made for pre-existing levels of cannabis use, there was no evidence to suggest the presence of reverse causal pathways in which lower educational achievement led to increased cannabis use. There was little evidence that frequent cannabis users were otherwise at risk of educational failure or underachievement. The authors suggested that this might be an indication of a causal link between the extent of cannabis use and subsequent educational failure (Fergusson *et al.* 2003). There is considerable attrition in this study as is almost inevitable in most long-term designs. The data on cannabis use were based on self-report and recall (participants were asked about cannabis use three to four years earlier) which may be biased and inaccurate.

Horwood *et al.* (2010) used data from three Australasian cohort studies involving over 6,000 participants to compare findings about cannabis use across studies and obtain pooled estimates of association using meta-analytic methods. Data on the age of onset of cannabis use (younger than 15, aged 15 to 17, never before age 18) and three educational outcomes (high school completion, university enrolment, degree attainment) were common to all studies. Each study also assessed a broad range of contextual factors. There were associations between age of onset of cannabis use and all outcomes such as rates of attainment were highest for those who had not used cannabis by age 18 and lowest for those who first used cannabis before age 15. These findings were evident for each study and for the pooled data and persisted after controlling for possible confounds. Pooled estimates suggested that early use of cannabis may contribute up to 17% of the rate of failure to obtain the educational milestones of high school completion, university enrolment and degree attainment.

Therefore, there is some evidence for a sequence from early cannabis use to poorer outcomes, but less evidence of a sequence from early alcohol use to depressed outcomes.

Intervention

Several interventions sought to influence substance abuse itself, but only one full study examined changes in substance abuse as a precursor to changes in school outcomes.

Bradshaw *et al.* (2009) conducted a randomised controlled longitudinal study of a classroom-centred programme, aimed at preventing poor pupil behaviour, including aggression and substance abuse, and so enhancing school performance and later participation. The intervention is a first-grade programme, combining the Good Behavior Game (a whole-class strategy that rewards positive behaviour of the group rather than individual behaviour) with an enhanced academic curriculum to improve students' reading, writing, maths and critical thinking skills. Teachers were given 60 hours of training prior to implementation and supervision and feedback from programme administrators throughout the year. The study involved 678 African-American children in first grade, following them through high school to age 19, after randomising half to the treatment and half to a control group. Teachers were also randomised to treatment or control. The treatment group here also acted as a control for a parallel intervention involving parents. Analysis was of intention to treat. The outcomes monitored were achievement, special education service use, graduation and participation in post-secondary education. Grade twelve reading and maths scores were measured using standardised KTEA scores. First-grade behaviour problems were assessed by the Teacher Observation of Classroom Adaptation-Revised (TOCA-R). Classroom behaviour and academic performance in grades six to twelve were assessed using teacher reports adapted from TOCA-R. Students'

substance use at age 13 was monitored through confidential self-report computer surveys. School records provided information on high-school graduation rates. Where data were missing from school records, self-report data from student's age-19 interviews were used. The intervention had no discernible effect on teacher-rated academic performance, KTEA reading performance, special education use, high school graduation or college attendance. There was a small (significant) difference in KTEA maths performance. The positive results were higher test performance in twelfth grade for reading and maths, much reduced use of the special education service for boys, higher rates of graduation and of college attendance. The treatment group also had lower rates of tobacco smoking and hard drug abuse (but not alcohol or cannabis). The intervention was generally more effective for boys than for girls, perhaps because poor behaviour was more prevalent among boys at the outset. The study was rated a 'near high' in quality by the independent Coalition for Evidence-based Policy. However, only 574 students were tracked through to grade twelve, meaning that the results for over 15% of the cases are missing or refused. Since these cases cannot be assumed to be a random subset of the original cohort, there must be some doubt about the meaning of any results relying on 'significance' rather than effect size. Since the intervention included enhanced curriculum and teaching in the subjects tested, it is not possible to say whether it was the substance abuse behaviour or the direct academic input that produced the results.

Therefore, there is some weak evidence that a very general intervention aimed at reducing substance abuse as part of a range of other behaviours can influence subsequent educational outcomes.

Mechanism

There are at least three possible mechanisms by which substances like drugs, alcohol and tobacco could influence school outcomes. They could cause cognitive impairment in early adolescence. They could lead to an amotivational syndrome or lethargy. This new review provides no direct evidence on either of these (but this may be partly a consequence of the databases searched). Lynskey and Hall (2000) claimed that there is little evidence for either of these mechanisms, especially since at least some of the highest attainers have been involved in substance abuse. It may be more likely that a link between early cannabis use and educational attainment arises because of the social context within which cannabis, in particular, is used. Early cannabis use is associated with the adoption of an anti-conventional lifestyle, characterised by affiliations with delinquent and substance-using peers and sometimes the precocious adoption of adult roles including early school-leaving, leaving the parental home and early parenthood.

Conclusion

It is notoriously difficult to demonstrate the absence of something, especially from such a wide-ranging but inevitably partial search, which is why social science adopts the principle of parsimony or simplicity. And it must be recalled that the search for this new review did not include medical databases. Nevertheless, the conclusion of this review, as it stands, has to be that there is insufficient evidence for a complete causal link from an individual's substance abuse to their educational outcomes. This is not to condone substance abuse, or deny that it has other possible dangers. Nor does this deny that evidence exists (but was not found in these databases) or will exist in the future. But at present, anyone with a sole concern to improve educational outcomes for those most at risk of underperformance would be advised to seek an intervention elsewhere.

8 Summary of what works

This is a review of the evidence for any causal links leading from the attitudes, aspirations and behaviour of children and parents (AABs) to educational outcomes, defined as attainment and participation. As expected, this new review is in fact a series of reviews. The findings are somewhat different for children and parents, and they are even more different for different types of AABs, and for attainment as opposed to participation. This final chapter simplifies the picture, summarises the evidence presented in Chapters 5 to 7, and ends by identifying the most promising bases for policy and practice interventions and further work. First, however, this chapter looks at the topic from a slightly wider perspective, considering some alternative ways forward in dealing with differential attainment by poverty and SES.

Complementary approaches to improving school outcomes

This review is firmly predicated on the desire of the funder, the Joseph Rowntree Foundation, to be surer about whether working to improve AABs for less advantaged families would have an effect on school outcomes. If so, and if lower-SES families generally portray less aspiration, lower motivation or poorer behaviour, for example, then working with AABs might be part of the solution to reducing the poverty gap in attainment. On the other hand, if AABs are not stratified by SES or do not have an effect on educational outcomes, then approaches targeting AABs are a much less promising way forward. That is why this review is significant. However, clearly neither the funders nor the reviewers accept as a premise that poverty should continue to exist, or that more promising and direct attempts to overcome the transmission of disadvantage should be ignored.

Further, there are many ways to improve education that are not explicitly related to AABs. And improvements in some AABs may be desirable in their own right, even where they have no effect on school outcomes. Attainment and participation are important but they are only two possible educational outcomes. Others, such as well-being, preparation for citizenship, resilience and happiness, could be just as important. For example, interventions to make school more pleasant and enjoyable, so enhancing school engagement, may not cash out into improved grades (Gorard and See, 2011). But this is still an intrinsically good thing to do (Hagenauer and Hascher, 2010), and it may lead to other desirable outcomes in terms of the preparation of young people as concerned citizens (Gorard and Smith, 2010). Similarly, the link between bullying and poorer attainment may be no more strongly established than for many of the AABs described in this review (Mooij, 2011; Perse *et al.*, 2011), but bullying is intrinsically wrong and must be reduced. If this then cashes out in terms of improved attainment as well, that is a bonus. And the same argument could be used for some of the AABs reviewed here. Studies of prenatal drug or alcohol abuse, for example, may not produce evidence of making much difference to children's attainment, but that is far from the only reason for combating such behaviours.

Perhaps the money and effort expended in handling AABs, such as raising parental expectations or enhancing self-efficacy artificially, could be used more simply. Using a regression discontinuity design, Robinson (2010) found that when English-language learners (Hispanic) are given substantive tests in areas like maths in their own language (Spanish), they perform better and that this might affect their track placement and so their long-term future. However, the nature of assessment is under the control of educators and is perhaps quite easily manipulated to reduce attainment gaps (Gorard, 2004b).

Even more directly, Duncan and Magnuson (2005) argued that simply increasing the family incomes of preschool children would be a promising intervention to reduce attainment gaps in young children. Given that there are currently few successful large-scale interventions, policies that target poor children directly, using the funds otherwise spent on educational and psychological interventions of uncertain impact, may be the most efficient short-term way to narrow school-readiness gaps. In which of the areas that are covered by this review would it be ethical to conclude that there is sufficient evidence to proceed with work on AABs, as a lever to improving school outcomes (presumably at the cost of funding other approaches)?

Reprise: the causal position for each AAB

Tables 8.1 to 8.6 provide a summary synthesis of the review findings, as presented in Chapters 5 to 7. Tables 8.1 (attainment outcomes) and 8.2 (participation outcomes) concern the effects of parental aspirations, attitudes and behaviours. Tables 8.3 and 8.4 concern children’s aspirations and attitudes, with attainment and participation respectively. Tables 8.5 and 8.6 concern children’s behaviours, with attainment and participation respectively.

Colour Key

Medium or strong evidence, all or mostly showing a positive link	Weak or very weak evidence, all or mostly showing a positive link	No good evidence at all, or evidence showing no link or no clear picture of a link
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In each table, the first column lists the AABs. The second column synthesises the review evidence on associations and longitudinal work and the final column synthesises the evidence on intervention work. The findings are summarised first in terms of the scale and quality of the evidence: none, weak, or medium (no areas were deemed strong in evidence), and then in terms of whether the evidence suggests a causal link (positive), no link (negative) or a combination (mixed). To assist the reader, areas where evidence is sufficient for a causal model are coloured dark blue, areas where evidence is merely indicative are coloured medium blue and all else is coloured pale blue (see colour key, above). Again, it is important to note that the results presented are for this new review of evidence. It is by some way the largest review ever conducted on this topic in the UK, with over 166,000 pieces of research considered. However, it is, inevitably, still incomplete. It is not about educational improvements unrelated to AABs; nor is it about the AABs themselves. It only addresses the 13 AABs found in the search. The focus was on recent research reports written in English, not exclusively about special needs provision using eight databases of educational, psychological and economic research (but not health, for example).

Evidence of a causal link between parental AABs and child outcomes

Parental involvement in their children’s learning was the only measure with sufficient evidence to meet the preset criteria for a robust causal model (Table 8.1). There is a reasonable case that parental involvement is a causal influence for their child’s school-readiness and subsequent attainment. The next steps here are to identify the key levers, design suitable and cost-effective interventions for different children’s age groups, and to monitor these in operation. A range of interventions would be needed for parents with children of different ages to enhance and incentivise their involvement in children’s learning. This would be what the US Institute of Education Science (IES) funds as Goal 3 (efficacy or replication studies) and Goal 4 (scaling up and implementation studies). See ies.ed.gov/funding/webinars/previous_webinars.asp (accessed on 19 September 2011). This is a model that could be usefully adopted by UK funders serious about making

progress in discovering how to reduce the poverty gap in education. Once promise had been shown in an area, then no more preliminary work would be funded until an intervention had been trialled, while, on the other hand, no intervention could be trialled until the preliminary work showed that it was feasible and ethical (see below).

Table 1 – Summary of strength and direction of evidence for parental AABs and attainment

AAB	Association/sequence	Interventions
Parent expectations	Weak, mostly positive	None
Parent involvement	Medium, positive	Medium, mostly positive
Parent substance abuse	Weak, mixed	None
Parenting style	Weak, positive	None

Table 2 – Summary of strength and direction of evidence for parental AABs and participation

AAB	Association/sequence	Interventions
Parent expectations	None	None
Parent involvement	Weak, positive	Weak, positive
Parent substance abuse	None	None
Parenting style	Weak, positive	None

Parental involvement is a behaviour that it is possible to change. Skaliotis (2010) found that half of the parents in their study became more involved with their children’s education over the two years of monitoring. This suggests that parental interest is not a fixed thing, and since it might lead to changes in behaviour and attitudes of pupils, this forms a good basis for building an intervention. The behaviour of parents and their involvement in children’s learning gives the clearest indication of a causal link to improved school outcomes (Desforges with Abouchaar, 2003). At preschool, a number of family literacy programmes are already running (see, for example, Hirst *et al.*, 2006). A review of 18 home-school collaboration interventions published from January 1980 to January 2002 found that they can be effective in achieving improved school outcomes (Cox, 2005). The most effective interventions appeared to be those where parents and school staff work together in collaboration, maintaining a two-way exchange of information, such as daily report cards and school-to-home notes. Such interventions work where the parents are interested in their child’s academic performance and are willing to put in the necessary time and effort, and by giving parents the know-how to help their children. Kendall *et al.* (2008) reviewed the UK Narrowing the Gap Programme and concluded that for interventions to remediate disadvantage and narrow the gap in outcomes for vulnerable groups they need a long-term focus, and a joined-up approach dealing with a range of negative influences holding children back, and involving the whole family. The linked review to this one (Cummings *et al.*, 2011) has further suggestions. An important consideration, highlighted in several of the studies in this review, is that interventions must consider the possible barriers to increasing parental

involvement, and seek solutions like aligning goals and language, and allowing flexible participation to suit differing life contexts (Hornby and Lafaale, 2011).

There is only a weak case that parental involvement is a causal influence on their children’s participation in post-compulsory education (Table 8.2). The next step here could be a focused call or search for more evidence on this, with a view to commissioning research where needed. Or this area could be included within the development of interventions for parental involvement.

The review confirmed the association both of parental expectations (Table 8.1) and of children’s expectations/aspirations (Table 8.3) with their attainment. However, the evidence for both falls well short of that needed to assume that it is a causal influence, because no relevant successful interventions were found. This could be remedied, by moving straight to the design of controlled trials of the influence of parental expectations and children’s expectations/aspirations. There is considerable in-depth and other evidence in Cummings *et al.* (2011) of previous experiences attempting to raise aspirations. Using such experience, the work could go straight to efficacy trials of favoured interventions (IES Goal 3 or 4 work, see above). However, such attempts may not work, as explained in Chapter 6, because aspiration or motivation is not enough in itself. The child has to know how to improve. Interventions also need to test for unwanted damage, of the kind possible where aspirations and expectations are unrealistic and not met in reality.

The review also confirmed the association of parenting style with attainment. However, the evidence falls well short of that needed to assume that it is a causal influence, both because the evidence of association was so sparse, and there were no relevant interventions. This issue could be subsumed within the more promising line of work on parental involvement.

There is very little evidence from this review that combating parent substance abuse has a discernible benefit for either attainment or participation. Assuming that interventions to reduce parent substance abuse are developed or in use for different outcomes anyway, any improvements in education would be a bonus.

Evidence for a link between a child’s aspirations or attitudes and outcomes

The evidence on a child’s self-concept or self-esteem falls short of that needed to assume that it is a causal influence on attainment, largely because some studies found no association after controlling for prior measures (Table 8.3). It is unlikely that the ongoing debate in the literature about the sequence of events can be resolved without some closely controlled and independent trials. Instead of more longitudinal work with path analysis or similar, experts on the link between child’s self-concept or self-esteem and attainment should assist in the design of testable propositions for independent evaluation. It is time for this area to move from what the IES would term Goal 1 (identification) and Goal 2 (development) or even Goal 5

Table 3 – Summary of strength and direction of evidence for child aspirations/ attitudes and attainment

AAB	Association/sequence	Interventions
Individual aspiration	Weak, mostly positive	None
Individual attitude	Weak, mixed	None
Individual motivation	Weak, mostly negative	Medium, positive
Individual self-concept	Medium, mixed	Weak, positive
Individual self-efficacy	Weak, mixed	Weak, mostly positive

Table 4 – Summary of strength and direction of evidence for child aspirations/attitudes and participation

AAB	Association/sequence	Interventions
Individual aspiration	Weak, mostly positive	None
Individual attitude	None	None
Individual motivation	None	None
Individual self-concept	Weak, mixed	None
Individual self-efficacy	None	None

(measurement) to Goals 2 and 3 work (see above). This area is more than ready; the move is overdue. However, there are some approaches in this area that are almost cost-free, very simple and would appear to generate few contra-indications. One such might stem from the study of asking pupils to write a self-affirming essay (in Chapter 6).

The evidence on child’s self-efficacy or locus of control also falls short of that needed to assume that it is a causal influence on attainment, largely because of the shortage of intervention studies, but also because of limited evidence of association or sequence. Rigorous evaluation in this area would be beneficial. The field is in a similar stage of immaturity to self-concept (see above). The review by Cummings *et al.* (2011) has some useful guidance on the kind of work needed in both of these areas, especially in regard to locus of control.

Within the studies of individual motivation and attainment there were a few that showed some promise from offering pupils an extrinsic (usually financial) motivation for results. Although the area of motivation in general is undeveloped as a causal phenomenon, it may be worth looking at a robust trial of payment by results for pupils in key groups, where the definition of the groups would be ethically sustainable (perhaps eligibility for free school meals). This might be a very interesting use for the current Pupil Premium for schools. There was almost no evidence concerning motivation and participation.

Evidence for a link between a child’s behaviours and outcomes

The review found indicative evidence of the influence of extra-curricular activities, after-school clubs, and participation in sports on attainment (Table 8.5) but hardly anything on post-compulsory participation in education (Table 8.6). The former still falls well short of that needed to assume that it is a causal influence, because so little evidence was found and because of the lack of controlled comparisons. Work in this area could be slowly built up, working towards a series of possible trials. The area is still in development stage (IES Goal 2, see above). One of the issues to face will be how to overcome geographical, school-based and income-based disparities in provision.

In general, not enough evidence was found in this review to suggest a causal link from individual work intensity while at school to attainment or participation. There was no clear evidence of sequence, no evidence from interventions on how much paid work pupils did while still in full-time education. Work in this area should probably not be a priority (although, as with substance abuse, there may be different outcomes to consider).

Table 5 – Summary of strength and direction of evidence for child behaviours and attainment

AAB	Association/sequence	Interventions
Extra-curricular	Weak, positive	None
Individual paid work	Weak, mostly positive	None
Individual poor behaviour	Weak, mostly positive	Medium, mostly positive
Individual substance abuse	Weak, mixed	Weak, positive

Table 6 – Summary of strength and direction of evidence for child behaviours and participation

AAB	Association/sequence	Interventions
Extra-curricular	None	None
Individual paid work	None	None
Individual poor behaviour	None	None
Individual substance abuse	Weak, mixed	None

In general, not enough good evidence was found in this review to suggest a complete causal link from poor pupil behaviour to attainment or to participation. There was too little clear evidence of association or sequence from poor behaviour to educational outcomes. However, there were a few promising interventions of reasonable quality, and so this area could repay further work. What is not clear from the few successful interventions in this area is how much of any effect is due to overcoming poor behaviour, and how much is due to the success of innovative teaching approaches adopted to deal with the poor behaviour. This could be quite easily settled by using the teaching approaches for mainstream pupils, and by encouraging better behaviour other than by altering or extending existing teaching. The importance of making progress in this area could come from a multiplier effect. Unlike the other changes to individuals' behaviour, reduced disruptive behaviour can benefit others in the classroom as well (Gorard and See, 2011).

There is very little evidence from this review that combating child (or parent) substance abuse has a discernible benefit for either attainment or participation. Assuming that interventions to reduce child substance abuse are developed or in use for different outcomes anyway, any improvements in education would be a bonus.

Suggestions for future research

Several of the AABs found in the search and covered in this review have such an unpromising evidence base that is not worth pursuing them at present, if the only reason for doing so is to improve educational outcomes. These include parental and individual substance abuse, children's general attitudes to education and the amount of paid work young people do during schooling (within reason). All of these are coloured red in the key findings above.

There has been very little rigorous work on the AAB causes of post-compulsory participation in education, which is quite surprising since widening participation has been a favoured policy for more than a decade in the UK. Prior reviews of specific areas of participation such as post-16 (See *et al.*, 2011) and HE (Gorard *et al.*, 2007) largely confirm this gap. Work could be commissioned in the most promising areas, to fill this gap. However, given that these same reviews also note that participation is closely related to prior attainment at school, measures to improve attainment could have a longer-term impact on participation as well.

It is noticeable that it is possible to devise a plausible explanatory mechanism for the effect of any of the 13 AABs covered in this review, even where there is little or no empirical evidence of effect. This suggests that the mechanism is the least important part of any causal model (just as, according to some accounts, in the development of many practical breakthroughs, such as the development of powered flight). If it is clear that altering an AAB works to improve educational outcomes with no damaging unintended consequences and at reasonable cost, then it matters less if the mechanism is not understood. On the other hand, even the most convincing explanation possible is of little consequence if the AAB has no discernible effect on educational outcomes (or is damaging).

Much of the work found in this review on the causes of attainment was conducted in the USA. Its results may be relevant to the UK, but it would be helpful to see rather more of this kind of work, concerning both participation and attainment, being carried out in the UK, and reflecting the country's specific context and culture. A particular concern is that any area may become dominated by only one style of work, contributing to only one part of the causal model (the longitudinal work on self-concept is a clear example). One way forward would be for funders to adopt an approach closer to that of US federal funding. Clearly an intervention study in any area would generally be premature and unethical unless there is a *prima facie* case that the intervention would be effective. Therefore, each iteration of the research cycle (Gorard and Cook, 2007) legitimately starts with exploratory development work (often small-scale and tentative). However, in the same way that it would be unethical to move to interventions with this preliminary basis, it would be unethical not to pursue any promising developments into efficacy and cost-effectiveness trials and, depending on results, leading to national roll-out and monitoring. Inevitably many ideas – even very promising ones – will not work (just as many pioneer powered aircraft failed to fly). But this is no reason not to test them, as appears to happen too often at present.

In general, there was no consistent reporting of effect sizes in the studies reviewed here, partly because the evidence in most areas is generally too immature at present, and partly because most authors still rely on significance testing alone. Without more consistent use of effect sizes, it is not possible to conduct either a meta-analysis of impacts or a cost-benefit analysis of interventions in each area. It is important that future work moves towards estimates of both, and that funders and researchers take account of the importance of this step. For the same reason, even where there is evidence in this review of the effect of an intervention, without effect sizes there can be no differential effectiveness estimates for specific sub-groups of learners such as low-SES, low-attaining or SEN pupils. Some studies did focus on specific sub-groups by design and these are noted throughout. This is very different from statistical dredging for differences by sub-groups after the research has been conducted.

Greater use of the simple four criteria model of causation would then be beneficial both to funders (who could specify what kind of evidence was lacking or next in order of priority) and to research groups and innovators. A summary work plan could include:

- beginning development of work on AABs and post-16 participation
- clarifying what aspirations and attitudes actually are
- encouraging a move towards reporting of effect sizes and, where possible, the costs of interventions

- overcoming the misplaced resistance from some quarters to any robust evaluations of ways to improve outcomes for poorer families
- designing suitable and cost-effective interventions to enhance **parental involvement** (including parenting styles and expectations) in their children's learning
- considering conducting efficacy trials of interventions that raise children's education **expectations**, if this is deemed ethical
- designing, developing and conducting closely controlled and independent trials on **self-concept/self-esteem** and **self-efficacy/locus of control** to decide on their causal or coincidental nature
- conducting trials to estimate the effects of extrinsic **motivation**, such as payment by results
- developing work on reducing poor classroom **behaviour**, and perhaps to confirm the causal influence of **extra-curricular activities**.

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