# Role theory of schools and adolescent health

*Chris Bonell, Sarah-Jayne Blakemore, Adam Fletcher, George Patton*

**Evidence that health and education are interlinked is transforming investment in adolescent health. However, no comprehensive theory of how schools influence mental and physical health, which could guide, and be tested through, empirical studies, exists. Using neuroscience, sociology, and other disciplines, we theorise that schools catering for students age 11–18 years can influence health by affecting the behavioural roles that are available for students to perform, the resources available to influence student behaviour, and how peers and teachers (known as the audience) respond. Some schools offer opportunities for students to adopt diverse pro-school roles and to maintain these roles via constructive feedback. Other schools focus narrowly on high academic attainment. Where pro-school roles are unavailable, are beyond students' resources, or elicit negative responses from teachers and peers, students might experience anxiety and choose to adopt anti-school roles, particularly in later adolescence. Behaviours that harm health, such as violence and drug use, are central to anti-school roles because they can facilitate belonging and status within anti-school peer groups and symbolise alternative transitions to adulthood.**

*Lancet Child Adolesc Health* 2019

Published Online
July 11, 2019
http://dx.doi.org/10.1016/S2352-4642(19)30183-X

**Department of Public Health, Environments and Society, London School of Hygiene and Tropical Medicine, London, UK** (Prof C Bonell, A Fletcher PhD); **Institute of Cognitive Neuroscience, University College London, London, UK** (Prof S-J Blakemore); **and Murdoch Children's Research Institute, Royal Children's Hospital, Flemington Road, Parkville, VIC, Australia** (Prof G Patton)

Correspondence to:
Prof Chris Bonell, Department of Public Health, Environments and Society, London School of Hygiene and Tropical Medicine, London WC1H 9NS, UK
**chris.bonell@lshtm.ac.uk**

## Introduction

Health and education are powerfully linked.[1] Mental health and behavioural problems have a profound effect on student engagement and educational attainment.[2] Conversely, schools have an equally substantial effect on students' health, with great variation existing between schools in terms of rates of violence, and use of tobacco, alcohol, and other drugs: differences that reflect school characteristics rather than merely differences between the students entering schools.[3–5] A range of theories have been suggested for the health benefits observed in students, including avoidance of health risks associated with early entry into labour markets, sexual activity, or criminality;[6] education of young people about how to promote their physical and mental health;[7] and enhanced provision of nurturing social environments, with growing evidence that interventions that modify the school environment also improve student mental and physical health across a range of outcomes.[8–10]

Such clear evidence of the effects of school on health are transforming approaches to investments during adolescence.[11] Yet, no comprehensive theory exists for how the school social environment affects the health and social development of students. Several theories are used to inform observational studies of the differences in health outcomes between schools and to inform the theories of change of new school-based health interventions that are evaluated in trials. But these theories generally do not describe the specific features of the school environment other than in terms of student behaviours and peer relationships.[12] For example, the social development model[13] suggests that young people are more likely to bond to school and other conventional social institutions when these institutions provide individuals with opportunities for learning, skills development, and rewards. This model further proposes that such bonds will reduce young people's involvement with delinquent peers and hence, engagement in antisocial behaviours. However, the model does not aim to describe the specific features of the school environment that promote bonding. Furthermore, this model only considers health risks arising from antisocial behaviours and does not describe how bonding to conventional institutions will reduce involvement with delinquent peers. This absence of functioning theory matters because without a plausible (and empirically testable) theory, our ability to interpret and learn from empirical studies is reduced, as is our ability to develop and test interventions that might modify the school social environment.

The theory of human functioning and school organisation is arguably the most comprehensive theory of how school environments influence health.[14] This model proposes that for students to adopt healthier (rather than riskier) behaviours, they should be able to reason and to relate to others who will support such decisions. Within this framework, students are more likely to develop such relationships if they are committed to school in terms of the school instructional order (ie, academic learning) and regulatory order (ie, norms for conduct). Commitment to school is more difficult for socioeconomically disadvantaged students because of a disjunction between the class-based culture of the school and that of students' families and neighbourhoods.[14] To build student commitment, particularly in socioeconomically disadvantaged students, schools should reframe learning and reduce various boundaries that hinder the students' commitment. Reframing learning helps to ensure that it addresses students' needs and preferences. Further, removing these boundaries enhances relationships between: students and teachers (so that they can interact more collaboratively), academic subjects (so that students can reflect on how these relate to their own lives), as well as schools and local communities (so that schools are less culturally distant from family and neighbourhood cultures). This theory predicts that the amount of health-related risk behaviours will be lower in schools in which more students are committed to learning and feel a sense of belonging in school, and in schools in which school life is focused on student preferences and characterised by strong connections between staff and students, academic learning and broader development, as well as the school and neighbourhood.

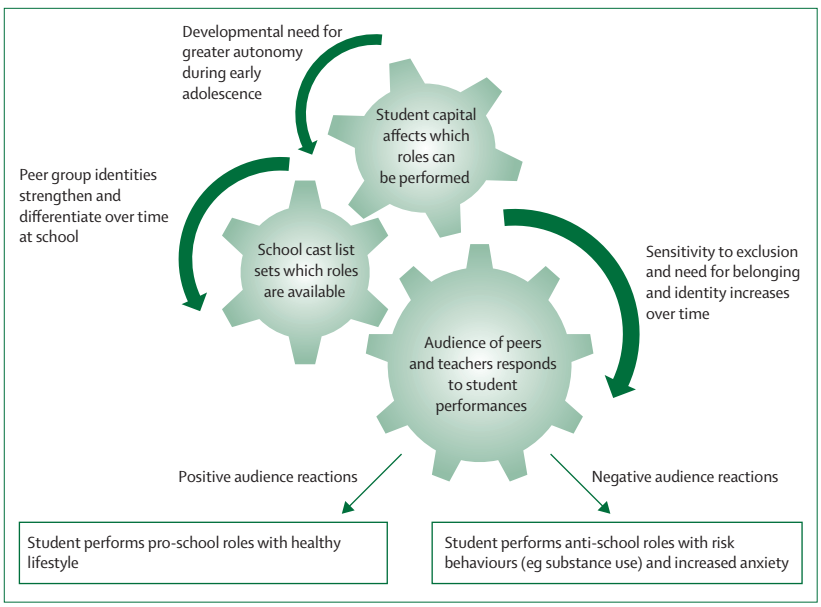


*Figure:* **The role theory of school and adolescent health**

However, despite this clear focus on how school environments might influence health, the theory of human functioning and school organisation has several limitations. Firstly, like other theories, such as the social development model,[13] this theory does not consider adolescent cognitive and social-emotional development, and so does not consider how the effects of school environment might vary by student age or developmental stage, including the effects of peer groups and emerging sexuality. Secondly, although the theory engages with how socioeconomic status might affect an adolescent's experience of school, it does not consider how other characteristics, such as gender or ethnicity, might affect commitment to school and decisions about health-related behaviours. Thirdly, the theory does not address how schools might affect mental health, despite there being evidence that schools exert small but important effects on various mental health outcomes.[5] Finally, the theory is only partially supported by empirical evidence. There is evidence that the proportion of risk behaviours (eg, smoking and violence) are lower in schools where more students feel committed to learning and a sense of belonging, and report better relationships with teachers,[15–20] particularly for students of low socioeconomic status.[21] There is also evidence from randomised trials that interventions to build a sense of commitment and inclusion within secondary schools promote various measures of physical and mental health.[8,22,23] However, there is less evidence that student risk behaviours, such as smoking, are lower, and commitment higher, in schools that focus on student preferences.[21,24]

In this ViewPoint, we use evidence from developmental cognitive neuroscience and psychology, sociology, and education to extend existing theories about the influence of school social environments on health, focusing on schools that cater for students from early adolescence (secondary schools in the UK and middle schools and high schools in the USA and other school systems in other countries, generally from ages 11–18 years). Cognitive neuroscience and psychology have made advances in understanding how cognitive processes change in adolescence and how these changes might help to explain heightened risk taking and other adolescent behaviours. Importantly for our theory, research indicates that sensitivity to peer influence of a wide variety of behaviours is stronger in adolescence than in either childhood or adulthood, and that adolescents generally take more risks when with friends because the presence of peers change how they make decisions.[25–27] Research also suggests that sensitivity to, and stress arising from, peer exclusion, and need for belonging, are generally greater in adolescents.[28] Sociological and educational research has made advances in understanding that young people can make rational choices to engage in risk practices when these practices serve practical and symbolic purposes.[29] Qualitative studies[30] show that students can practice risk behaviours, such as drug use or violence, when these behaviours facilitate entry into or symbolise belonging or status with so-called anti-school peer groups. These risk behaviours are more likely to happen in students who derive little sense of belonging or status from learning and other pro-school activities.

## Role selection, performance, and emerging identity

We propose a theory of school influences on health that attributes health-related risk behaviours and mental health problems as arising within the context of students playing various roles before an audience of teachers and peers (figure). Erving Goffman developed thinking about behaviour and interactions in terms of roles and audiences in his dramaturgical approach to sociology, using the metaphor of theatrical performances.[31] Such analyses view individuals as using performances to manage an audience's impression of them and aiming to promote their belonging and status within social groups. Dramaturgical analyses stress that performances are precarious; a performer will aim for successful impression management but there will, in any performance, be the risk of failure to convince, stigma, and group exclusion.

Adolescents generally have the role of student imposed on them but can choose a particular version or versions of this role to perform. Some students will typically perform the pro-school role of an engaged or compliant student, following school rules and staff expectations of what constitutes pro-school behaviour. Examples of pro-school behaviour include participating in class activities, staying on task, and completing their work. Other students will more typically perform anti-school roles,

such as the disengaged or disruptive student. For example, not engaging in teacher-directed classroom activities, engaging in off-task interactions with peers, and insulting or challenging teachers. Many students will perform different roles in different contexts, with varying degrees of engagement, dependant on which teachers and peers they are with and which lesson or other school activity they are engaged in. According to the dramaturgical theory, students will tend to choose roles that maximise their chances of achieving belonging and status in their particular school and social group.

Not all students will be able to play all roles because schools will differ in what roles are available and because students will differ in what resources they can bring to these roles. In terms of the so-called cast list of available roles, some schools will have teachers focused almost exclusively on academic students or perhaps those excelling in arts or sports, so that the only pro-school roles will be in these categories. Other schools will recognise students playing a broader array of roles, such as the striving or well-behaved underachiever, or the challenging student who is dealing with social problems both inside and outside of school. In some very academic schools, it might be hard to play an anti-school role and find belonging with many peers. In other schools, it might be hard to play a pro-school role and find belonging with peers. In others, myriad roles will find acceptance with various peer groups. The cast list of available roles will also tend to vary with adolescents' progression through secondary school and their psychological development. In the early years of secondary school, student peer-group networks will have been disrupted by the transition from primary school; new peer groups will be forming but will initially tend to be undifferentiated and unstable.[32,33] Relationships among students will probably become more stable and reciprocal as students move through the school system over time and role choices will become more differentiated.

As well as the availability of roles, there will also be variation in students' abilities to play various roles. As students progress through secondary school, adolescents will generally develop a greater desire for autonomy and for a personal sense of identity.[26,34] Adolescents might therefore be less likely to choose to perform the role of committed learner unless schools make this option attractive by allowing older students more freedom over what and how they learn and behave. Students will also vary in the resources that they can bring to playing a particular role. We can think of these resources in terms of economic, cultural, and social capital.[35,36] Economic capital refers to money enabling actions; for example, a family having the financial ability to have a quiet room for homework to enable an adolescent to perform the role of an engaged student. Cultural capital refers to learnt knowledge or skill enabling actions; for example, a student being able to speak the same dialect as teachers, thus helping the student to perform the role of engaged learner. Social capital refers to relationships and trust between individuals in order to enable action. Social capital can be subcategorised into so-called bonding ties with similar individuals and so-called bridging ties with different individuals: for example, a student having bonding ties with other engaged students and bridging ties with teachers, thus enabling them to perform the role of an engaged student.[37]

Students of higher socioeconomic status will generally possess more economic, cultural, and social capital and will often find it easier to perform pro-school roles. Adolescents from lower socioeconomic groups or more deprived neighbourhoods might have fewer of the right forms of economic, cultural, or social capital to draw on. These adolescents might also possess capital that actually impedes their ability to perform pro-school roles. For example, sociological studies suggest that students who have bonding ties with students with anti-school attitudes (a form of social capital) or who possess cultural capital that helps them to play adult-like roles outside school (such as gang-leader or carer for an ill parent) might find it harder to perform the role of committed student at school.[38]

It is less clear how arrays of capital will vary by ethnicity or gender; it will not simply be the case that ethnic minority or female students will always possess less capital. The amount of capital will depend on the particularities of groups in specific settings. Schools should be more successful in engaging students in pro-school roles where they aim to develop students' cultural and social capital equitably. Schools will generally be less successful in engaging all students where they distort some students' social capital: for example, by concentrating together students of lower socio-economic status in low-ability school classes. What constitutes the optimal cultural or social capital will also vary between schools. Schools with more diverse staffing could, for example, ensure that the cultural and social capital that students already possess can be used by the students to interact with their teachers and perform pro-school roles.

## Audience reaction and its impact on performers

Student performances of roles occur before an audience of teachers and peers. Any performance, such as that of engaged learner, school athlete, or disruptive student, is precarious. Most students will reflect on their performances and audience reactions, assessing whether they have successfully managed the audience's impression of them, and whether this will promote their belonging and status within the group. Where an audience is unappreciative or hostile, this will likely cause the student to experience anxiety, possibly with implications discussed below for mental health, or to reassess whether they should continue to perform the role in question. Teacher reactions to performances will likely reflect the institution's expectations and its style of providing feedback. In schools that only offer a narrow

range of roles, expectations will tend to focus narrowly on whether students reach a certain academic standard. In other schools, expectations might also encompass the efforts students have made and their trajectory of achievement over time. In some schools, feedback will merely provide a summative judgement of attainment, while in others, feedback will also include constructive criticism and further learning.[39]

The reactions of the student audience to performances (for example of academic, sporting, or disruptive performances) will also generally reflect their expectations and norms of what behaviour is socially appropriate. In some schools, students with norms supportive of academic work and attainment will be numerous and influential. In other schools, peer groups that display anti-school behaviour will predominate so that norms could be more hostile to academic engagement and achievement.[40] Norms will tend to evolve as students move through adolescence and through the school years, which are influenced by the wider culture. For example, student audiences might be influenced by gender norms about whether academic engagement is acceptable in some groups of boys[41] or whether involvement in sport is acceptable in some groups of girls.[42]

Performers will vary in how sensitive they are to audience reactions. Adolescence is associated with increasing awareness of others' perspectives,[43,44] and increased susceptibility to peer influence[25,26] and sensitivity to peer exclusion.[28] During the course of adolescence, students tend to become more sensitive to audience reactions from teachers but especially from other students. Students will therefore be more likely to experience anxiety about performances and to judge that a performance has failed and that they must change roles. Students might experience severe anxiety, particularly where audience reactions take the form of persistent personalised criticism from teachers or persistent peer abuse and exclusion,[45] and there is evidence that this increases vulnerability to depression.[46] Some students might judge their performances inadequate, experiencing anxiety even in the absence of such audience reactions, for example, when students hold perfectionist attitudes towards academic achievement[47] or have a heightened sensitivity and insecurity about their status among their peers.

A student withdrawing from a particular pro-school role might decide to change to performing an anti-school role when they perceive that alternative pro-school roles are not available, are not performable given the capital they possess, or that such roles will not enable them to develop a sense of belonging and status among their peers.[26,28,34] The need to perform anti-school roles to develop belonging with peers might be particularly acute in schools where students feel that staff will not protect them from violence.[48,49]

A systematic review[30] of qualitative research shows that when students are attracted to perform anti-school roles, they might engage in health-related risk behaviours to facilitate their joining or gaining status in groups that display anti-school behaviours. Risk behaviours might include those that are overtly antisocial, such as violence, or underage or illegal substance use, or others such as early sexual activity, consumption of junk food, and withdrawal from sport. What these behaviours have in common is that they can be used by adolescents to symbolise a transition to an adult sense of identity that nonetheless deviates from the sorts of transitions encouraged by the school. Schools generally aim to promote a transition to an adult sense of identity in terms of the observance of rules and investment in education or physical fitness for the future. Engagement in anti-school behaviours suggests an alternative sense of identity rooted in a disregard for such norms and a prioritisation of the present over the future. The particular behaviours performed will depend on the options that are available to and culturally resonant for students, depending on their age and social environment.[50] Different age groups will tend to have different access to particular substances, such as tobacco, alcohol, cannabis, and other drugs. Sexual behaviour will generally be more likely to occur among older rather than younger adolescents. Different recreational drugs and substances or forms of violence might have cultural cache in some communities but not others.[51,52] Withdrawal from sport or engagement in unhealthy dieting might also have symbolic meaning for particular groups, such as girls influenced by sexist media imagery.[53]

Thus, students' physical and mental health can be influenced by their performance of roles in schools. This influence can occur directly as a result of the stress experienced in playing roles or as a result of negative audience responses and exclusion from peer groups, leading to mental health problems and potentially increasing the risk of self-harm or suicide.[54,55] Such risks will tend to increase in the course of adolescence as sensitivity to peer influence and exclusion increases. Threats to health can also occur indirectly as a result of engagement in the health-related risk behaviours listed above. Such behaviours could influence mental and physical health in the short-term, for example, via violence and substance use predisposing individuals to mental health harms or injuries.[45] Risk behaviours, such as violence, substance use, unhealthy eating, and physical inactivity, will also influence individuals' health over the course of their life via increasing risks of non-communicable disease.[56]

Our theory proposes that school environments are an important influence on student health but it is not overly deterministic; we do not deny that other factors will also be important. Inevitably, some students who are not performing anti-school roles will adopt some of the health-related risk behaviours listed above. Some students will also experience anxiety as a result of performing pro-school roles and not only anti-school roles, including instances where pressure from teachers or parents for

academic achievement is intense. However, our theory suggests that the overall rates of risk behaviours will be higher in students who are taking on disengaged, anti-school roles because of the perceived symbolic importance to these students. Our theory also states that overall amounts of anxiety and emotional problems will generally be more common in disengaged students since these students will tend to have less social support in schools as a result of their nonparticipation of pro-school roles.

## Conclusion

In summary, we propose a role theory of schools and adolescent health. Schools influence adolescents' health and wellbeing by affecting how the students can perform a particular student role in school, with students that perform an anti-school role more likely to engage in health-related risk behaviours, as well as experience anxiety and mental health problems.

All adolescents must adopt one or more student roles, which range from pro-school roles, such as the committed learner, to anti-school roles, such as the disruptive student. All adolescents make an active and creative choice of which roles to perform and how. But the students' choices and performances are both enabled and constrained by the school environment, as well as the resources, in the form of economic, cultural, and social capital, that students possess. The cast list of available roles differs between schools. Students' economic, cultural, and social capital might vary by socioeconomic status, gender, and ethnicity. Performances of pro-school and anti-school roles are precarious (ie, they might fail to convey to audiences the impression intended by the performer), depending on the responses of the audience (comprised of both teachers and peers). Teacher responses are influenced by the schools' norms around expectations (focused narrowly on absolute achievement or also encompassing student effort and learning trajectory) and styles of feedback (focused on summative assessment or also constructive feedback). Peer responses are also influenced by local norms, including those relating to views on academic engagement and gender roles.

Negative audience responses will likely arouse anxiety and could encourage an adolescent to switch roles. During puberty, students tend to become increasingly sensitive to peer influence and risk of exclusion, and more prone to anxiety and therefore at risk of withdrawing from pro-school roles. When students cannot satisfy their need for belonging and status by performing pro-school roles, they are likely to switch to anti-school roles as an alternative means of achieving these ends. Crucially for our theory of school influences on health and wellbeing, the adoption of anti-school roles often involves partaking in symbolically important health-related risk behaviours. Furthermore, performances of such roles might bring with them higher levels of anxiety. Students performing anti-school roles are more likely to engage in risky behaviours and experience anxiety than students in pro-school roles.

***Panel:*** **Predictions of how school characteristics affect pro-school and anti-school behaviours in students**

- Schools that offer diverse activities through the academic curriculum, broader social life of the school , and extra-curricular activities (so that there are more diverse pro-school roles) will have more student commitment and fewer student risk behaviours and emotional problems
- Schools that make pro-school roles more attractive by offering graduated autonomy in learning and other aspects of school life (so that more students remain in pro-school roles as they grow older) will also have more student commitment and fewer risk behaviours and emotional problems in older students
- Schools that assess student performances in terms of effort and trajectory, and that provide constructive feedback (so that more students persist with pro-school roles), will have more student commitment and fewer student risk behaviours and emotional problems than schools that focus narrowly on absolute achievement (particularly in older students)
- Schools that have a higher equity in academic achievement and more diverse staffing in terms of socioeconomic status, ethnicity, and gender (so that more students possess social and cultural capital that enables them to engage with staff and perform pro-school roles) will have more commitment and fewer risk behaviours and emotional problems in these groups
- Schools that cluster socially disadvantaged students together, for example, in low-ability streams (so that such students are less likely to build bridging social capital with pro-school students), will have lower student commitment and increased risk behaviours, particularly in later adolescence

A scientific theory needs to be able to inform hypotheses that are open to empirical assessment of falsifiability. In the panel, we hypothesise how features of the school environment might interact with student characteristics to influence amounts of risk behaviours and mental health problems.

We extend previous theories by incorporating a life course and developmental perspective on the roles and emerging identity of adolescents in their school contexts. Whereas previous theories have emphasised schools offering opportunities and rewards for learning[13] or reframing learning towards student preferences and eroding boundaries;[14] our theory focuses on whether schools equitably provide students with a diverse repertoire of pro-school roles and sufficient support that students maintain participation in these roles. Unlike previous frameworks, our theory suggests that participation in pro-school roles can sometimes have negative consequences, for example, via anxiety resulting from whether the performance of a particular role has been successful or not. Furthermore, our theory recognises that students are active and creative agents exercising choices, but these choices are enabled and constrained by their emerging psychological dispositions, by the economic, cultural, and social capital they possess, and by the school environment. Our theory is, however, almost wholly informed by evidence from disciplines relating to developmental cognitive neuroscience and psychology, education, and sociology done in high-income countries and so could be less pertinent to other settings.

We recommend that future empirical studies explore the hypotheses set out above. Observational studies could examine school-level and student-level influences on adverse health outcomes.[3] Randomised trials could assess the effectiveness of interventions with theories of change informed by our theory as a further means of empirical assessment.[57] We intend to write a further paper operationalising our theory so that it might inform theories of change of future interventions. But, in short, our theory states that such interventions should: increase the diversity of academic and other social roles for students, including to serve as health buddies and peer educators;[58] offer extracurricular activities in the domains of sports, arts, and community service (eg, as included in school-based positive youth development programmes);[59] grant older students more say in decisions, as is the case in some whole-school interventions;[8,22,23] and ensure schools address discrimination according to students' socioeconomic status, ethnicity, gender, and sexuality.

**Contributors**

CB conceived the idea for the paper and wrote the first draft. SJB conceived the sections of the paper concerning cognitive neuroscience and edited successive drafts of the paper. AF advised on sociological research and drafted the figure. GP conceived the sections of the paper concerning mental health and edited a draft of the paper.

**Declaration of interests**

We declare no competing interests.

**References**

1 Bonell C, Jamal F, Harden A, et al. Systematic review of the effects of schools and school environment interventions on health: evidence mapping and synthesis. *J Public Health Res* 2013; **1:** 1.

2 Suhrcke M, de Paz Nieves C. The impact of health and health behaviours on educational outcomes in high-income countries: a review of the evidence. Copenhagen: WHO Regional Office for Europe, 2011.

3 Aveyard A, Markham WA, Chenge KK. A methodological and substantive review of the evidence that schools cause pupils to smoke. *Soc Sci Med* 2004; **58:** 2252–65.

4 Bonell CP, Parry W, Wells H, et al. The effects of the school environment on student health: a systematic review of multi-level studies. *Health Place* 2013; **21:** 180–91.

5 Kidger J, Araya R, Donovan J, Gunnell D. The effect of the school environment on the emotional health of adolescents: a systematic review. *Pediatrics* 2012; **129:** 925–49.

6 Patton G, Sawyer SM, Santelli JS, et al. Realising the future of global health: a Lancet commission on adolescent health and wellbeing. *Lancet* 2016; **387:** 2423–78.

7 Bonell C, Humphrey N, Fletcher A, Moore L, Anderson R, Campbell R. Why schools should promote students' health and wellbeing Education policy shouldn't focus solely on academic attainment. *Br Med J* 2014; **348:** 3078.

8 Bonell C, Allen E, Warren E, et al. Initiating change in the school environment to reduce bullying and aggression: a cluster randomised controlled trial of the Learning Together (LT) intervention in English secondary schools. *Lancet* 2018; **392:** 2452–64.

9 Bonell C, Wells H, Harden A, et al. The effects on student health of interventions modifying the school environment: systematic review. *J Epidemiol Community Health* 2013; **67:** 677–81.

10 Langford R, Bonell CP, Jones HE, et al. The WHO health promoting school framework for improving the health and well-being of students and staff. *Cochrane Database Syst Rev* 2011; **1:** CD008958.

11 Fernandes G, Sridhar D. World bank and the global financing facility. *Br Med J* 2017; **358:** 3395.

12 Bonell C, Fletcher A, Jamal F, et al. Theories of how the school environment impacts on student health: Systematic review and synthesis. *Health Place* 2013; **24:** 242–49. 13 Hawkins JD, Weiss JG. The social development model: an integrated approach to delinquency prevention. *J Prim Prev* 1985; **6:** 73–97.

13 Hawkins JD, Weiss JG. The social development model: an integrated approach to delinquency prevention. *J Prim Prev* 1985; **6:** 73–97.

14 Markham WA, Aveyard P. A new theory of health promoting schools based on human functioning, school organisation and pedagogic practice. *Soc Sci Med* 2003; **56:** 1209–20.

15 Aveyard A, Markham WA, Lancashire E, Almond J, Griffiths R, Cheng KK. A cohort study to examine whether inter-school variation in smoking uptake is mainly due to differences in pupil composition or differences in schools. *Health Place* 2005; **11:** 55–65.

16 Aveyard P, Markham WA, Lancashire E, Bullock A, MacArthur C, Cheng KK. The influence of school culture on smoking among pupils. *Soc Sci Med* 2004; **58:** 1767–870.

17 Bisset S, Markham WA, Aveyard P. School culture as an influencing factor on youth substance use. *J Epidemiol Community Health* 2007; **61:** 485–90.

18 Markham W. School culture and teenage substance use: a conceptual and operational framework. *Educ Rev* 2015; **67:** 282–99.

19 Markham WA, Aveyard P, Bisset SL, Lancashire ER, Bridle C, Deakin S. Value-added education and smoking uptake in schools: a cohort study. *Addiction* 2008; **103:** 155–61.

20 Tobler AL, Komro KA, Dabroski A, Aveyard P, Markham WA. Preventing the link between SES and high-risk behaviors: "value-added" education, drug use and delinquency in high-risk, urban schools. *Prev Science* 2011; **12:** 211–21.

21 Bonell C, Beaumont E, Dodd M, et al. Effects of school environments on student risk-behaviours: evidence from a longitudinal study of secondary schools in England. *J Epidemiol Community Health* 2019; **73:** 502–08.

22 Flay BR, Graumlich S, Segawa E, Burns JL, Holliday MY. Effects of 2 prevention programs on high-risk behaviors among African American youth: a randomized trial. *Arch Pediatr Adolesc Med* 2004; **158:** 377–84.

23 Patton G, Bond L, Carlin JB, et al. Promoting social inclusion in schools: group-randomized trial of effects on student health risk behaviour and well-being. *Am J Public Health* 2006; **96:** 1582–87.

24 Shackleton N, Jamal F, Fletcher A, et al. Development and pilot of a new measure for empirically examining the theory of human functioning and school organisation. *Crit Public Health* 2017; **27:** 248–62.

25 Chein J, Albert D, O'Brien L, Uckert K, Steinberg L. Peers increase adolescent risk taking by enhancing activity in the brain's reward circuitry. *Dev Sci* 2011; **14:** 1–10.

26 Blakemore SJ. Avoiding social risk in adolescence. *Curr Dir Psychol Sci* 2018; **27:** 116–22.

27 Gardner M, Steinberg L. Peer influence on risk taking, risk preference, and risky decision making in adolescence and adulthood: an experimental study. *Dev Psychol* 2005; **41:** 625–35.

28 Sebastian C, Viding E, Williams KD, Blakemore SJ. Social brain development and the affective consequences of ostracism in adolescence. *Brain Cogn* 2010; **72:** 134–45.

29 Fletcher A, Bonell C, Sorhaindo A, Strange V. How might schools influence young people's drug use? Development of theory from qualitative case-study research. *J Adolesc Health* 2009; **45:** 126–32.

30 Jamal F, Fletcher A, Harden A, Wells H, Thomas J, Bonell C. The school environment and student health: a systematic review and meta-ethnography of qualitative research. *BMC Public Health* 2013; **13:** 798.

31 Goffman E. The presentation of self in everyday life. New York: Doubleday, 1959.

32 Temkin DA, Gest SD, Osgood DW, Feinberg M, Moody J. Social network implications of normative school transitions in non-urban school districts. *Youth Soc* 2018; **50:** 462–84.

33 Burnett Heyes S, Jih YR, Block P, Hiu CF, Holmes EA, Lau JYF. Relationship reciprocation modulates resource allocation in adolescent social networks: developmental effects. *Child Dev* 2015; **86:** 1489–506.

34 Erikson EH. Identity: youth and crisis. New York: Norton, 1968.
35 Bourdieau P, Wacquant L. An invitation to reflexive sociology. Chicago: University of Chicago Press, 1992.
36 Coleman JS. Social capital in the creation of human capital. *Am J Sociol* 1988; **97:** 95–120.
37 Granovetter M. The strength of weak ties. *Am J Socio* 1973; **78:** 1360–80.
38 Fletcher A, Bonell C. "Escaping from prison'': female students' substance use and the school environment. *J Epidemiol Community Health* 2008; **62:** 10.
39 Rattan A, Savani K, Chugh D, Dweck CS. Leveraging mindsets to promote academic achievement: policy recommendations. *Perspect Psychol Sci* 2015; **10:** 721–26.
40 Willis P. Learning to labour: how working class kids get working class jobs. Aldershot: Saxon House, 1977.
41 Legewie J, DiPrete TA. School context and the gender gap in educational achievement. *Am Sociol Rev* 2012; **77:** 463–85.
42 Spencer RA, Rehman L, Kirk SFL. Understanding gender norms, nutrition, and physical activity in adolescent girls: a scoping review. *Int J Behav Nutr Phys Act* 2015; **12:** 6.
43 Dumontheil I, Apperly IA, Blakemore SJ. Online usage of theory of mind continues to develop in late adolescence. *Dev Sci* 2010; **13:** 331–38.
44 Tamnes CK, Overbye K, Ferschmann L, et al. Social perspective taking is associated with self-reported prosocial behavior and regional cortical thickness across adolescence. *Dev Psychol* 2018; **54:** 1745–57.
45 Bond L, Carlin JB, Thomas L, Rubin K, Patton G. Does bullying cause emotional problems? A retrospective study of young teenagers. *Br Med J* 2001; **323:** 480–84.
46 Allen NB, Badcock PB. The social risk hypothesis of depressed mood: evolutionary, psychosocial, and neurobiological perspectives. *Psychol Bull* 2003; **129:** 887–913.
47 Inglés CJ, García-Fernández JM, Vicent M, Gonzálvez C, Sanmartín R. Profiles of perfectionism and school anxiety: a review of the 2×2 model of dispositional perfectionism in child population. *Front Psychol* 2016; **7:** 1403.
48 Fletcher A. Young people's experiences of school and drug use: systematic review and case-study research. PhD thesis, University of London, 2008.
49 Waldron LM. The messy nature of discipline and zero tolerance policies: negotiating safe school environments among inconsistencies, structural constraints and the complex lives of youth. *Sociol Stud Child Youth* 2005; **11:** 81–114.
50 Currie C, Molcho M, Boyce W, Holstein B, Torsheim T, Richter M. Researching health inequalities in adolescents: the development of the Health Behaviour in School-Aged Children (HBSC) family affluence scale. *Soc Sci Med* 2008; **66:** 1429–36.
51 Esteban McCabe S, Morales M, Cranford JA, Delva J, McPherson MD, Boyd CJ. Race/ethnicity and gender differences in drug use and abuse among college students. *J Ethn Subst Abuse* 2007; **6:** 75–95.
52 Hurcombe R, Bayley M, Goodman A. Ethnicity and alcohol: a review of the uk literature. York: Joseph Rowntree Foundation, 2010.
53 Westerberg-Jacobson J, Ghaderi A, Edlund B. A longitudinal study of motives for wishing to be thinner and weight-control practices in 7- to 18-year old Swedish girls. *Eur Eat Disord Rev* 2012; **20:** 294–302.
54 Mulvey KL, Boswell C, Zheng J. Causes and consequences of social exclusion and peer rejection among children and adolescents. *Rep Emot Behav Disord Youth* 2017; **17:** 71–75.
55 Holt MK, Vivolo-Kantor AM, Polanin JR, et al. Bullying and suicidal ideation and behaviors: a meta-analysis. *Pediatrics* 2015; **135:** 496–509.
56 Mokdad AH, Forouzanfar MH, Daoud F, et al. Global burden of diseases, injuries, and risk factors for young people's health during 1990–2013: a systematic analysis for the global burden of disease study 2013. *Lancet* 2016; **387:** 2383–401.
57 Bonell C, Fletcher A, Morton M, Lorenc T. 'Realist Randomised Controlled Trials': a new approach to evaluating complex public health interventions. *Soc Sci Med* 2012; **75:** 2299–306.
58 Campbell R, Starkey F, Holliday J, et al. An informal school-based peer-led intervention for smoking prevention in adolescence (ASSIST): a cluster randomised trial. *Lancet* 2008; **371:** 1595–602.
59 Curran T, Wexler L. School-based positive youth development: a systematic review of the literature. *J Sch Health* 2017; **87:** 71–80.