



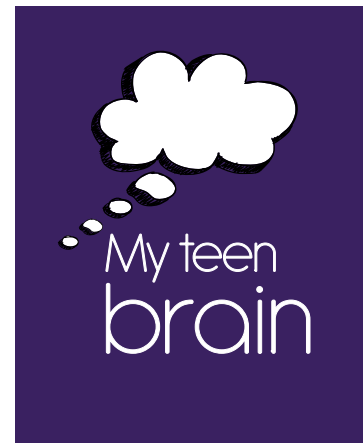
My teen brain



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As adults, we can struggle to communicate with young people, worry what they are doing and can be baffled by their behaviour.



However, recent interesting research on the adolescent brain has given us an insight into adolescent development and enabled us to better understand this period in a young person's life.

In response to this research Hertfordshire County Council's Childhood Support Services, in conjunction with Professor John Coleman and Family Links, have launched My Teen Brain. The initiative aims to highlight what happens in the teenage brain which, in conjunction with experience and environment, can affect many aspects of teenage behaviours, including emotions, relationships, behaviours, sleep and attitudes to risk.

We hope you find this guide informative and would welcome your views. If you have any comments you can email us at:
css@hertfordshire.gov.uk

Further information can be found on our dedicated website
www.hertsdirect.org/myteenbrain

Childhood Support Services
Because childhood matters



My Teen Brain – The Teenage Brain

1. Growth, change and opportunity

The remarkable brain

Of all the organs in the human body the brain is the most remarkable. It is enormously complex, controlling every other organ and acting as the seat of physical, intellectual and emotional activity. For teenagers, the brain is an organ that is virtually unnoticeable, and most young people have very little idea of what is happening in their brains during and after puberty.

Many factors influence behaviour

However, what happens in the teenage brain has major consequences for all aspects of behaviour, and the more we know about this topic, the more we will be able to understand adolescent development. Having said this, it is also important to emphasise that the brain is only one factor influencing teenage behaviour. Genetic factors and the environment in which young people grow up will have as much impact on behaviour as both genes and the brain. This is a time where the brain is extremely malleable. Environment, including education, will be shaping the brain at this time and the ability to learn and be creative is at its peak. The capacity of a person to learn will never be greater than during adolescence. This is not a time for stigmatisation, but a time for great opportunity and learning.

The adolescent stage is particularly important

Magnetic resonance imaging (MRI) is a type of scan that uses strong magnetic fields and radio waves to produce detailed images of the inside of the body. With recent advances in MRI scanning technology it is now possible to say quite a bit more about the adolescent brain than 15 or 20 years ago. Neuroscientists have shown particular interest in the adolescent brain for one simple reason, the years from puberty onwards are years when the brain shows more change and development than at any other time apart from the first three years of life. This makes the adolescent stage of particular importance, since we may be able to learn a considerable amount about the brain in general, by studying this period of life.

Scanning is still in its early stages

As we look more closely at the teenage brain we should bear in mind that the technology of scanning is still in its very early stages. Although a lot has been learnt, it is essential to remember that this aspect of science is in its infancy. Some of the first findings about the adolescent brain have offered exciting insights into teenage development, but other early conclusions have proved controversial. It will be some time before an accepted body of facts will be available.

My Teen Brain – The Teenage Brain

2. Changes and individual differences

A time of major change

The main finding that neuroscientists have discovered from scanning technology is the enormous amount of change that occurs in the brain from puberty onwards. It has been established that this is a period of rapid and profound changes in the brain. Interestingly, it has also been shown that the brain continues to change and develop until the early twenties, where previously it was thought that all development was done in the early years.

Everyone is different

Another thing to say is that everyone is different. Just as our physical appearance, our intelligence, and our personality differs from individual to individual, just the same is true of our brains. Everyone's brain is slightly different, and this means that the part the brain plays in determining development will vary according to the individual.

Grey matter

Next, we can identify some of the main changes that occur during this period. Grey matter consists of nerve cell bodies (neurons), nerve fibres and support cells and is responsible for transporting information from sensory and motor stimuli. The amount of grey matter increases in late childhood, and then is gradually rearranged and reorganised during the adolescent years. This process is known as pruning and refers to a mechanism whereby unwanted connections between neurons are removed, allowing the existing connections to function better. The pruning process is not negative and is a normal and a necessary part of becoming an adult by allowing the brain to prune back grey matter to fine tune and ensure strong growth in the most used areas. A simple way to describe this process is to liken it to the pruning of a tree, where the weaker branches are cut back to allow the stronger branches to grow.

New connections

Another important change occurs as the connections along the nerve fibres become more mature. Connections between neurons become more efficient, as well as stronger, and this process is referred to as myelinisation. Finally, the connections between the two hemispheres of the outer surface of the brain (called the cortex) become better organised. The increased connectivity between the hemispheres allows the individual to use more areas of the brain, and to co-ordinate different aspects of brain activity.

Key points for adults

- Be supportive – big changes are under way.
- Note that the brain is only one factor influencing behaviour.
- Keep in mind that the family, school and community have a role to play.
- Treat each person as an individual – we all develop at our own pace.

3. Sites under construction

Thinking and planning

The research from the last decade has identified the sites or areas in the brain which experience the most significant growth and change during adolescence. Two sites have been identified as being particularly affected by the developmental process. The first is the prefrontal cortex. This part of the brain is responsible for intellectual activity and self-awareness; how we plan, forward plan, problem solve and make decisions and social interaction (the bit that stops us making inappropriate decisions and comments). This is a time where the brain is extremely malleable. Environment, including education, will be shaping the brain at this time and the ability to learn and be creative is at its peak. The capacity of a person to learn will never be greater than during adolescence.



Emotion and sensation

The second site undergoing rapid change is the amygdala which is part of the limbic system. This area of the brain is associated with emotion, sensation and arousal. Both sites show marked change, but some studies have suggested that the development of the prefrontal cortex lags behind the development of the amygdala and that, during adolescence, this area can be hypersensitive. This has led some researchers to argue that this explains why teenagers are more likely to take risks, and to 'live in the moment'. However, this argument is still open to debate and it is important to remain cautious for the moment.

Key points for adults

- Remember that changes in the brain will allow new learning and the development of new intellectual skills.
- Changes in the brain may explain 'typical' teenage behaviour, such as risk-taking and living in the moment. Be cautious about this.
- Everyone is different. Behaviour will be influenced by many factors.

4. Hormones

Hormone balance

It is well known that the release of certain hormones accelerates during and after puberty. The obvious example is the release of the sex hormones, such as testosterone and oestrogen. In fact, there are a large number of different hormones affecting behaviour at any one time, and the teenage years are a time of significant change in the balance of a variety of hormones in the body.

Hormones and brain development

It is important to be aware that some hormones (called cortisol) are released at times of stress and fear. These hormones prepare the body for flight or fight, and are an essential feature of the capacity of the individual to survive threats in the environment. However, we also know that continuing high levels of such hormones can affect brain development. For example, the hormone cortisol, released when the individual is frightened or anxious, is likely to hinder brain development. At a critical time such as adolescence, high levels of hormones such as cortisol can be damaging to long-term development.



Key points for adults

- Teenage behaviour will not always be consistent or sensible. Make allowances for this in your reactions.
- Remember that a lot is happening to the young person, much of which is invisible from the outside.
- You can help your teenager learn how to deal with mood swings.
- Your support is essential during these years, as this stage is a critical period for brain development.

5. Sleep



Melatonin

It has been quite an eye-opener to discover that the way the body clock works in teenagers is not the same as it is in children or adults. The hormone melatonin, which is one of the main triggers that makes us sleepy in the evenings, is released approximately two hours later among adolescents than in other age groups.

Biological reasons for sleep patterns

If young people liked to stay up late at night, or resisted getting up in the morning, parents tended to put that down to teenagers just being difficult. Now we know that there is a genuine biological reason why adolescent sleep patterns are different from those of other age groups.

Young people need their sleep

This is an important finding, as young people need their sleep. If they get too little sleep, both behaviour and learning can be affected. Parents have a key role to play here in helping teenagers get into regular sleep routines and ensure that everything possible is done to ensure sufficient sleep during the teenage years.

Key points for adults

- How much sleep a young person gets will affect learning and behaviour. Try and let teenagers catch up on sleep at the weekend.
- Young people may need help to develop regular sleep routines:
 - have a regular night time routine,
 - avoid going on phones/tablets/listening to music etc late at night,
 - have some relaxing time before bed,
 - try reading before bed,
 - avoid caffeine.

My Teen Brain – The Role of Adults

6. Significance

The role of parents and carers

Some parents and carers of teenagers frequently feel that they no longer have a role as parents. They see that their sons and daughters prefer to talk to their friends rather than to them. They may experience rudeness and disrespect, where previously they enjoyed warm relationships with their children. They are no longer sure about how to respond, or know what parents of teenagers are meant to do when dealing with conflict and the need for independence.

Parents of teenagers matter

In fact parents and carers of teenagers matter hugely. They are just as important during the teenage years as they are during early childhood, but they are important in a different way. All the research shows that parents have a profound effect on a teenager's development. Everything from health to school achievement, from self-esteem to risk-taking, will be affected by relationships in the home.

The teenager is both child and adult

Why do some teenagers push their parents away? Why do some argue and challenge their parent's views all the time? These things are part of normal adolescent development. It may seem contradictory, but it does make sense. On the one hand, young people need to try out being independent, and they need some space to do this without the help of their parents. On the other hand, they are not yet ready to be completely independent. They are on a journey, and this will take time. It is best to think that inside every young person is **both** a child and an adult. This may help explain the contradictory behaviour.

Key points for adults

- Remember that your behaviour has a major impact on the young person.
- It will help if you know as much as possible about normal adolescent development.
- Be loving and warm. Offer encouragement where possible.
- Be involved, and show an interest in the life of your teen.

7. Parenting styles

Different parenting styles

The concept of parenting styles refers to the different ways that parents behave with their sons and daughters. Some parents might put more emphasis on discipline, while others may be more relaxed and flexible about what the teenager is allowed to do. During the early 1960s, psychologist Diana Baumrind¹ conducted a study on more than 100 preschool-age children (Baumrind, 1967). The four main styles commonly described are:

Authoritarian

In this style of parenting, children are expected to follow the strict rules established by the parents. Failure to follow such rules usually results in punishment. Authoritarian parents fail to explain the reasoning behind these rules. If asked to explain, the parent might simply reply, “Because I said so.” These parents have high demands, but are not responsive to their children. According to Baumrind, these parents “are obedience- and status-oriented, and expect their orders to be obeyed without explanation” (1991).²

Authoritative

Like authoritarian parents, those with an authoritative parenting style establish rules and guidelines that their children are expected to follow. However, this parenting style is much more democratic. Authoritative parents are responsive to their children and willing to listen to questions. When children fail to meet the expectations, these parents are more nurturing and forgiving rather than punishing. Baumrind suggests that these parents “monitor and impart clear standards for their children’s conduct. They are assertive, but not intrusive and restrictive. Their disciplinary methods are supportive, rather than punitive. They want their children to be assertive as well as socially responsible, and self-regulated as well as cooperative” (1991).²

Indulgent

Indulgent parents have very few demands to make of their children. These parents rarely discipline their children because they have relatively low expectations of maturity and self-control. According to Baumrind, indulgent parents “are more responsive than they are demanding. They are non-traditional and lenient, do not require mature behaviour, allow considerable self-regulation, and avoid confrontation” (1991).² Indulgent parents are generally nurturing and communicative with their children, often taking on the status of a friend more than that of a parent.

Indifferent

An indifferent parenting style is characterized by few demands, low responsiveness and little communication. While these parents fulfil the child’s basic needs, they are generally detached from their child’s life. In extreme cases, these parents may even reject or neglect the needs of their children.

¹Baumrind, D. (1967). *Child care practices anteceding three patterns of preschool behavior*. *Genetic Psychology Monographs*, 75(1), 43-88. ²Baumrind, D. (1991). *Effective parenting during the early adolescent transition*. In P.A. Cowan & E. M. Hetherington (Eds.), *Advances in family research* (Vol. 2). Hillsdale, NJ: Erlbaum.

The research on parenting styles has shown that the style that leads to the best outcomes for young people is the authoritative parenting style. This is because parents who tend to use this style are warm and loving, but also firm where necessary.

What young people need

Different parenting styles can lead to more, or less, conflict. Therefore a parent who tends to use an authoritarian style may expect to have to deal with more conflict than someone who is indulgent. Yet, it is clear that an indulgent style is not what most teenagers need. They need to know where the boundaries are, and they need their parents to provide safety and security.

The authoritative parenting style

At the heart of the research on parenting styles lie two dimensions of parenting behaviour: these are responsiveness and demandingness. The authoritative parenting style is high on both these things. The authoritative parent would be responsive to the individual needs of the young person, and would be warm and loving. However this parenting style also involves demandingness. This means the adult has clear expectations and is able to communicate these to the young person. It also means providing firm boundaries so that the teenager understands the need for limits and structure.

Key points for adults

- The style that most fits the needs of a maturing adolescent is the authoritative style.
- Be clear about rules and consequences, but always explain your reasons.
- Be mindful of the young person's need for increasing independence.
- Be sure to ask your teenager's opinion. Listen to and respect their views, and if you agree with them take them into account. If you don't agree, explain why.
- Let the young person know they are valued and respected.
- Set the rules with the young person so that they have a say in how they are decided.
- Make sure all rules are age appropriate and the young person is aware of what will happen if they are broken.
- Be sure that adults also take time for themselves.

8. Communication

Why won't my teenager talk?

Adults often feel teenagers do not want to talk. The young person may grunt, turn away or show indifference. The adult then assumes that the young person has no interest in communication. However, this is not necessarily true. Teenagers will talk, and indeed will want to talk, but in ways that feel safe. Teenagers will talk so long as they do not feel they are being interrogated. Young people will talk at times that feel right for them, such as in the car, or late at night. Teenagers will talk so long as their privacy is respected.



Communication goes both ways

One of the key facts about communication is that it is a two-way process. Talking and listening go hand in hand. If someone feels that they are being listened to, they are more likely to be open and communicative. One of the things that happens between adults and teenagers is that this process seems to break down, and this is often because the adult takes charge. The adult sees communication as 'telling the young person something' or 'getting a message across'. Because of this, it is not surprising that the young person has the sense of not being heard. Communication becomes a one way process, with the young person expected to be the listener. When adults and teenagers are really listening to each other, communication between the generations can work well.

Communication is a skill that can be learnt

While it is clear that things such as driving a car involve a skill, it is rarely recognised that communication is a skill too. Teenagers go through a period of rapid learning in their thinking and language development. Learning to communicate is part of this process. Teenagers often say that 'adults are good at talking', meaning that they themselves feel less confident about getting the right words out at the appropriate time. Adults can play a key role here in helping young people develop communication skills, something that is essential in all relationships.

Key points for adults

- Be flexible about the timing of any conversation. Try and find a time that is good for the young person.
- Be prepared to allow teenagers a degree of privacy. This is essential as part of the growing-up process.
- Teenagers do want to talk, so long as their needs are respected.
- Communication is a two-way process. The more one person is prepared to listen, the more the other will be prepared to talk.
- Try and make yourself available to your young person by letting them know when you are free to talk (and listen) if they want to talk to you about anything.
- Communication in a car is sometimes a good time to talk, as there is no eye contact and the young person doesn't feel interrogated.

9. Managing conflict

Why conflict?

Conflict can be caused by many different issues in the family. With teenagers, disagreement often occurs as a result of differences of opinion about household rules, or about the behaviour of the teenager. Many conflicts arise because of the boundaries that parents put in place, such as the time to come home at night, or use of the internet. As has already been noted, teenagers need boundaries, even though they may complain, or resist them through disobedience or non-compliance. Boundaries create safety and security, and without boundaries young people feel lost.

More on parenting styles

Different parenting styles will lead to more, or less, conflict. The parent who is authoritative is responsive to the age and the needs of the young person, while at the same time setting clear goals and boundaries. Conflict can be reduced if the boundaries are set with the interests of the young person at the centre, and if the reasons for any limits are clearly explained. Boundary setting should be done with the teenager's welfare at heart, and not for the convenience of the adults involved. If at all possible, any rules or limits should be negotiated with the young person in advance. This can have the effect of reducing conflict, while at the same time helping the teenager to learn about conflict management.

Sanctions for teenagers

There are bound to be situations where the rules are broken, and sanctions may have to be imposed. These will need to be age-appropriate, and suitable for the circumstances and for the individual. Sanctions used often by parents of teenagers include grounding, loss of privileges, loss of pocket money, and various restrictions on freedom. There is no right or wrong answer, and each family will have different ideas about what will work with their teenager. It is important to note that harsh or punitive sanctions are almost always counter-productive, leading to greater conflict in the long-term. The more sensible the rules, and the more explanation there is for any sanction, the lower the level of conflict is likely to be.

Key points for adults

- As teenagers take more control over their lives, there may be conflict with parents. It is part of the process of growing up.
- Parents can manage conflict, and reduce the extent of it, by using an authoritative parenting style, and setting boundaries and limits which are clearly in the best interests of the young person.
- Be prepared to listen, and don't rush to judgement.
- Make sure that all rules are fully explained, and are for the benefit of the young person or the family as a whole.
- Sanctions should be linked to the misbehaviour, and should be fair and age appropriate. Be clear as to why the sanction is being imposed.
- Only make sanctions that you intend to uphold – don't make false threats.
- Avoid harsh punishment; this will only lead to more conflict.

My Teen Brain – Risk and Resilience

10. Understanding risk



What is risky behaviour?

There are many types of risky behaviour. Some are potentially more harmful than others. Almost every teenager will drink too much alcohol at one time or another, but only a few will experiment with hard drugs. Seriously risky behaviours tend to cluster together, so heavy drug use may go alongside engaging in unsafe sex, or taking risks with personal safety.

However, taking normal risks is part of everyday life e.g. learning to ride a bike, learning to swim, starting a new project etc. If we are not prepared to take an element of risk we would not get very much done! As children get older, the adults in their life have less control of the risks that they are taking and that can feel scary.

Why do teenagers take risks?

Adolescent brain development is one reason why teenagers take risks, but it is only one explanation out of many possible explanations. It is important to remember that many teenagers do not engage in serious risk-taking, or only do so on rare occasions. Other reasons for risk-taking include peer pressure and low self-esteem.

The trainee adult

Some risk-taking has a positive function, as it provides a means for teenagers to learn about harm and safety. Young people have to experiment to find out what is right for them, and to discover the limits of sensible behaviour. Teenagers are sometimes referred to as trainee adults. Trainees do not always get everything right, and they learn by their mistakes. Risk-taking, as long as it is not too serious, can offer valuable learning experiences.

Learning to think ahead

Risk-taking can occur in many different settings. Young people who leave their homework to the very last minute are taking on a type of risk. Teenagers who self-harm or who stay out late at night without a means of getting home are taking very different risks. Risk-taking can occur in the health arena, at school or at work, in social relationships and so on. This leads to the conclusion that learning about consequences, and being able to think ahead, are the most important skills for teenagers to develop.

Key points for adults

- Remember that not all risk-taking is bad. Some risk-taking is essential for learning.
- Be willing to allow the young person gradually increasing levels of independence.
- Letting go is one of the hardest tasks for parents and carers. Try and accept it gracefully.
- Talk to your young person about the risks we all take and discuss any concern you may have with them.
- If things go wrong, do provide as much support as possible. The lecture and the sanctions (if there have to be sanctions) can come later.

11. Protective factors

What is meant by protective factors?

Protective factors are the elements in the life of the young person that help reduce the chance of serious risk-taking. These include individual, family and social factors. Protective factors also come into play following a risk-taking incident. Here, for example, a parent may act to minimise the consequences of a negative event.

Everyone has negative events in their lives. In the case of the teenager these could range from failing an exam, to a health risk, or involvement in anti-social behaviour. Where protective factors are in place these will help to reduce the chances of harm following such negative events.

Individual differences

It is an obvious thing to say, but no two individuals are the same. In the case of risk-taking, teenagers will vary enormously depending on age, stage of development, gender, ethnic background and so on. In addition to this, factors such as personality, intelligence and interests will also play their part. Even within the same family, siblings will differ in their approach to risk-taking behaviour. It is important to keep individual differences in mind when considering risk-taking.

The role of the family

It is generally believed that the family acts as one of the most important protective factors in relation to risk-taking behaviour. The more parents and other family members remain engaged and supportive of the teenager, the less the chance of risk-taking. It is not only parenting styles that are important here. Adults act as role models in many spheres. Parental behaviour will have an influence on the young person, and this influence will include health behaviours, the management of conflict, and of course, risk-taking itself.

Peers and the school

While many adults see the peer group as having a negative influence, the peer group can act as a protective factor. There are many different types of peer influence, not all of them bad. In some circumstances the peer group can protect the individual's safety and help to reduce the extent of risk-taking.

The school has a part to play too. Research shows that schools vary in the impact they have on out-of-school behaviour. The more engaged the young person is in school, and the more identified he or she is with the school ethos, the lower the chances of serious risk-taking.

Key points for adults

- Don't be too hard on the teenager if mistakes are made. Not everyone gets it right first time.
- Try to ensure that as much learning as possible is gained from any mistakes that are made.
- Remember that the family has a major role to play. Parents are the first line of support when things go wrong.
- Don't forget that friends and the wider peer group can be a source of support too. Engage with your teenager's friends, and get to know them. They can play a big role if your teenager runs into difficulties.

12. Resilience

What is resilience?

Resilience has many different meanings. It can mean the capacity to overcome serious adversity, such as trauma, bereavement, life-threatening illness, or poverty and deprivation. In this sense it applies to a relatively few individuals.

Resilience can also mean a general characteristic such as grit or determination, applying to everyone. In this sense resilience is taken to mean the ability to bounce back after upset, or to be able to overcome obstacles.



How can we promote resilience?

The promotion of resilience differs depending on the meaning. We can all play a part in helping our young people become resilient and confident adults by helping them overcome challenges. Research shows the positive impact that a supportive adult can have in a young person's life. Resilience can be taught in schools as part of a life skills or Personal, Social Health and Economic Education (PSHE) curriculum in school. Similarly, all adults will be able to recall times where they have had to overcome challenges and can use this knowledge to help and guide young people who are experiencing difficult times.

Of course, resilience can also be developed as part of learning in the family. However, where resilience is applied to the overcoming of serious adversity, it is a more complex process.

For an individual to be resilient in the face of serious adversity it is generally considered that individual, family and community factors can all play a part. The stronger the protective factors (as defined in the previous section), the more possible it will be for the individual to show resilience in the face of adversity.

Key points for adults

- Resilience has different meanings. In one sense it applies to everyone, but in another sense it only applies to the few.
- Resilience for everyone can be promoted in school and in the family.
- For those facing serious adversity it is a more complex process.
- Relating to and/or relying on those who you can is very important for resilience.
- We are all unique, diverse and brilliant in our own way. Understanding our own strengths and using them, is key to our resilience.

Parents' booklist – teenagers

How Teenagers Think

Jellyellie (2007) White Ladder Press Ltd

Blame my Brain

Nicola Morgan (2013) Walker Books Ltd

Teenagers, what every parent has to know

Rob Parsons (2007) Hodder and Stoughton

How to Talk so Teens Will Listen and Listen so Teens Will Talk

Adele Faber and Elaine Mazlish (2006) Piccadilly Press

The Nature of Adolescence

John Coleman (2010) Routledge

Get Out of My Life: But First Take Me and Alex into Town

Tony Franks and Suzanne Wolf (2008) Profile Books

Emotional Intelligence

Daniel Goleman (1996) Bloomsbury

Let's Talk About Sex

Robie Haris (2005) Walker Books

Growing Up: All about Adolescence, Body Changes and Sex

Susan Meredith (2004) Usborne Publishing

Whatever! A down-to-earth guide to parenting teenagers

Gill Hines and Alison Baverstock (2006) Piatkus

Why won't my teenager talk to me?

(2014) Dr John Coleman

Navigating Teenage Depression

Gordon Parker and Kerrie Evers (2009) Allen & Unwin

Raising Boys

Steve Biddulph (2010) Harper Thorsons

Raising Girls

Steve Biddulph (2013) Harper Thorsons

Further reading for professionals

Adolescence, Risk and Resilience

editors: John Coleman and Ann Hagel (2007) Wiley

Children, risk and safety on the internet

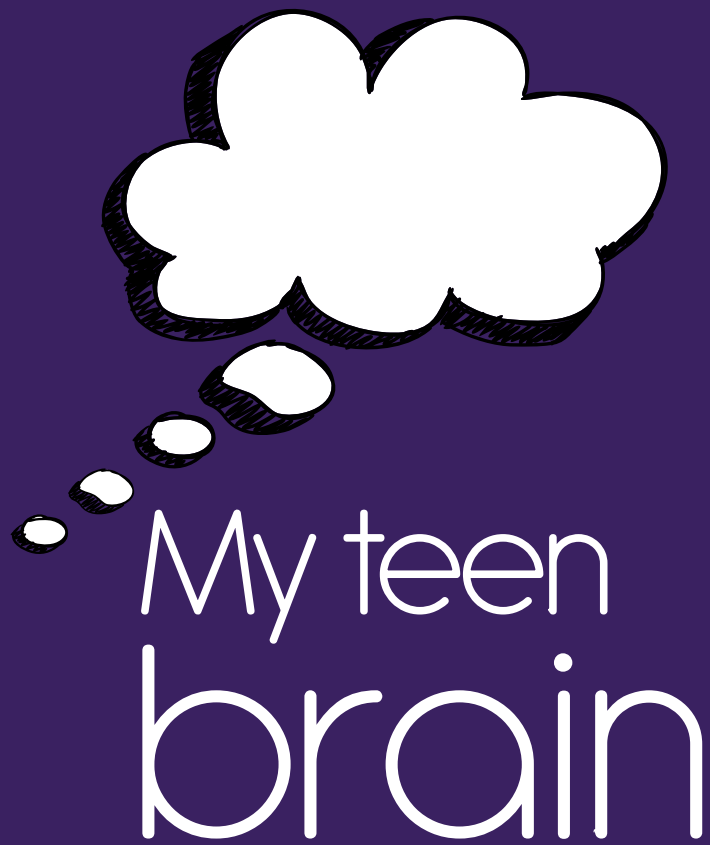
editors: Sonia Livingstone, Leslie Haddon and Anke Gorzig (2012) The Policy Press

Feeling Like Crap: young people and the meaning of self esteem

Nick Luxmoore (2008) Jessica Kingsley

Working with Anger and Young People

Nick Luxmoore (2006) Jessica Kingsley



My teen brain

