

**Building stress resilience in early adolescents’ lives (BReal)**

Teacher Guidance

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| *None of the below resources and notes are mandatory for the lessons to be delivered effectively. However, we received requests from teachers during development of the lessons that additional resources and scientific references would be useful, so we have developed this document in response. We have also included detailed slide notes in the Notes section of the slide decks in PowerPoint.* |

**Notes on classroom environment and safeguarding**

**Establishing ground rules**

It is important that ground rules are in place to create a safe learning environment that enables students to learn effectively but minimising the likelihood of a public disclosure. Work with students to establish ground rules with your class, such as: ‘everyone has the right to be heard and respected, we won’t share our own personal experiences and we have the right to pass.’

**Encouraging questions**

Make a box or envelope available in which students can place questions, anonymously or with their name on, to avoid having to voice them in front of the class.

**Student disclosures**

Students should not be encouraged to share personal matters in the classroom, but should be made aware of the opportunities and processes for making a disclosure in a more appropriate setting. Should a student make a disclosure about a personal matter in the lesson, you should follow the school’s safeguarding and child protection policies and safeguarding protocols, and inform the Designated Safeguarding Lead, so that appropriate support can be put in place.

Follow the school’s safeguarding and child protection policies if a disclosure or reference to the use of an unhealthy coping strategy, such as, but not limited to, self-harm or disordered eating, is made in the classroom.

**Situating the BReal lessons**

These lessons fit within the “Physical health and mental wellbeing: secondary” section (page 36) of the Department for Education’s [Relationships Education, Relationships and Sex Education (RSE) and Health Education Statutory Guidance](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1090195/Relationships_Education_RSE_and_Health_Education.pdf). Specifically, these lessons address:

* how to talk about their emotions accurately and sensitively, using appropriate vocabulary.
* that happiness is linked to being connected to others.
* how to recognise the early signs of mental wellbeing concerns.
* how to critically evaluate when something they do or are involved in has a positive or negative effect on their own or others’ mental health.

These lessons link to “Health education: Mental health and emotional wellbeing” standards H6, H7, H9, and H10 in the [PSHE Association Programme of Study](https://fs.hubspotusercontent00.net/hubfs/20248256/Programme%20of%20Study/PSHE%20Association%20Programme%20of%20Study%20for%20PSHE%20Education%20(Key%20stages%201%E2%80%935)%2c%20Jan%202020.pdf?hsCtaTracking=d718fa8f-77a8-445b-a64e-bb10ca9a52d8%7C90ef65f6-90ab-4e84-af7b-92884c142b27) (page 22).

These lessons can form part of wider topics or units on mental health, emotional wellbeing, stress, resilience, and/or friendship.

These lessons have particularly strong cross-curricular links to biology (human physiology). They could also be linked through extension activities to creative writing (writing new case study scenarios and their results when the lesson’s strategies are applied or not applied), or art (exploring what stress looks and feels like artistically).

**Notes on using the BReal materials**

BReal, or "Building stress resilience in early adolescents’ lives", is a set of three lessons on stress and how to deal with it, developed by a team from the Departments of Psychiatry, Experimental Psychology, and Clinical Neurosciences at the University of Oxford.

Notes/teaching script to aid teachers who may feel unfamiliar or uncertain about the material can be found in the ‘notes’ section of each slide deck.

In each slide deck, there is a slide listing support info for students. It includes a space for you to add school-specific contact info or resources; please do so.

In the discussion activities, you do not have to disclose to your students any of your personal experiences with stress. If you choose to do so, this is at your discretion.

These lessons are intended to support student skill development, not just knowledge dissemination. So, we encourage you to focus on discussion and listening, rather than feeling that you need to deliver a 'lecture'.

These lessons work best when delivered together as a 3-module unit. The material in each module is designed to develop and reinforce the material in the other modules. Please teach it as a whole.

The first lesson ("Born to be brave") covers the science of stress, adolescence as a critical time of brain development and stress vulnerability, and how practicing being brave is important for learning to deal well with stress.

The second lesson ("Learning from mistakes") covers the science of learning from mistakes, why adolescence is the best time to practise this, and how changing our behaviour can change how we feel.

The third lesson ("Changing our stress response") covers the "stress bucket" concept, the science of stress in relation to social experiences, and how understanding brain development can help adolescents support their own and their friends' mental wellbeing.

Each lesson comes with a 1-hour lesson plan (separate document), though the timings can be customised as needed.

Each lesson comes with a worksheet (separate document), that has discussion questions and a chart activity.

The BReal materials also come with a parent information sheet (separate document) that you can give to students to share with their parents.

**Extension ideas**

1. If your school has any existing channels for fostering interactions between older and young students, you could consider having older students help deliver parts of the lessons – this may encourage younger students to do the practice tasks, if the instructions came from their older peers.
2. If your school has an existing in-house reward points system, e.g. ‘house points’, you could consider awarding points for completion of the lesson practice tasks.
3. You could tailor the provided case study examples in the lessons to better fit the specific circumstances or common challenges of your school.

**Glossary**

**Amygdala:** part of the limbic system in the brain; it signals to us that there is a threat or danger.

**Dopamine:** a ("happy") chemical messenger released into the brain when we get an unexpected reward.

**Growth Mindset:** an approach to mistakes that focuses on learning, e.g. "mistakes help me learn".

**Fixed Mindset:** an approach to mistakes that focuses on not being able to change, e.g. "why try, I'll fail".

**Homeostasis:** keeping the body's functions balanced.

**Limbic system:** part of the brain that signals the alarm when you feel stressed.

**Prefrontal cortex:** part of the brain that supports learning and that helps to calm the limbic system and control stress.

**Stress:** the more clinical definition describes stress as the feeling of being overwhelmed or unable to cope with mental or emotional pressures.

**Stressor:** Anything that threatens the body’s homeostatic balance.

**Stress bucket:** an imagery tool for visualizing your stress levels, the causes of your stress (water = stressors) and the coping strategies you can use (taps) to relieve your stress.

**Resilience:** to have the mental flexibility to cope well with stressors and struggles.

**Striatum:** a region of the brain that supports learning and that dopamine is released into.

**Yerkes-Dodson effect:** the idea that we need just the right amount of stress to perform at our best.

**Frequently Asked Questions**

*Additional resources and references to answer these sorts of questions can be found in the “Additional readings and videos” section further below.*

**Question: “Why does my friend cope better with stress than me?”**

Answer: Students will have different pre-existing susceptibility to stress. The stress bucket tries to illustrate that everyone’s stress levels – and how easily they get stressed – are naturally different between individuals. Some people are biologically more sensitive to their environment and this has helped the human species adapt and survive in different environments in the past. When the world was full of dangers, being really sensitive to threats and potential threats kept our ancestors alive. For example, it was better for the brain to signal that there might be a tiger hidden in the long grass and for the person to run away in anticipation, rather than the brain not signalling the potential threat and that person getting eaten.

**Question: What makes people more resilient than others?**

Answer: That is the million-dollar question and scientists still do not fully understand. How people respond to and manage stress depends on many factors, including social, economic, and environmental factors as well as factors that relate to the individual person. At the individual level, we know some people are more or less sensitive to stress, but many of those who are very sensitive to stress also show great resilience when faced with very challenging situations. Scientists believe lots of factors are involved, like genes and early childhood experiences, but also having good social relationships with people they trust and having active lives.

**Question: What is the last area of the brain to develop?**

Answer: There are a few regions that continue to change across the developmental transition from childhood to adulthood. These include parts of the prefrontal cortex that are involved in quickly learning the consequence of choices and parts of the parietal lobe that are involved in learning about other people’s behaviour. These areas of the brain keep changing until about the mid 20s. This is an average though; some people will have “adult-like” brains at earlier ages and some at later ages.

**Question: Are there differences between boys and girls?**

Answer: Yes, these differences are mostly because of the different sex hormones that kick in during puberty. Of course this biology also interacts with the differing aspects of the social contexts of boys, girls and non-binary people. All of these influences combine to impact on individuals’ behaviour. However, overall, there often seems to be more differences between individuals within each sex than between the sexes.

**Question: What happens if part of the brain is damaged?**

Answer: It depends which part is damaged, how severely and when during lifespan it was damaged. If the prefrontal cortex is damaged it can change lots of different complex behaviours, such as planning, decision making, learning the consequences of choices, inhibiting behaviour and short term memory. If the amygdala is damaged it can change how people make decisions and how they feel emotions such as fear. In the 1800s there was a man called Phineus Gage whose prefrontal cortex was damaged in an accident. His doctor said that after his accident “he was no longer Gage” - his personality had changed so much. More recently a woman, known to scientists by her initials SM, was found to have damage to the amygdala because of a rare illness. She is very friendly and outgoing but she struggles to recognise threat and experiences less fear.

**Question: Why do some people find social situations really stressful?**

Answer: While social groups were critical for our ancestors’ survival, being around others and competing for resources can also lead to conflicts. This means that being aware of other people’s behaviour and our impact on others is really important. People vary in how sensitive they are to this information. Being socially excluded is painful (and can risk our very survival, especially prehistorically). So being sensitive to the potential for social rejection has evolutionary advantages. This likely underlies why some people are more sensitive to how their own behaviour is seen and impacts others in a social group.

**Question: What happens to the brain if you have no friends?**

Answer: Some parts of the brain get bigger and some get smaller. The brain changes to best manage the situation. Because humans are social animals, being alone can be stressful at any age and the feelings of loneliness that can come with being alone might be a way for the brain to drive the person to seek out social company. When people find other individuals that they share interests and values with they find it really rewarding – that's the brain telling them they are safe and supported.

**Question: Is the brain always plastic?**

Answer: Yes – but it appears to show most neuroplasticity during early childhood and adolescence. During early childhood it is growing and pruning (editing) lots of connections in response to the wide range of new experiences a child goes through. During late childhood and adolescence there is further strengthening and pruning of connections – a kind of “fine tuning” process during maturation that helps to make the person function successfully in their current environment.

**Question: What happens if you are not flexible enough or too flexible?**

Answer: Everyone is different in how behaviourally flexible they are. Just like with varying sensitivity to stress, differences in one’s degree of mental flexibility also probably helped our ancestors to survive and adapt to different challenges in varying environments. However, if someone’s behaviour is not able to adapt and be flexible they might be very rigid in their thinking and behaviour. They might want to control everything and everyone around them. If someone is too flexible they might feel out of control and jump from idea to idea, activity to activity and not be able to focus on something important they need to get done. Researchers think there is a sweet spot in the middle but that each can be advantageous in different situations.

**Question: Why are teenagers more sensitive to peer influence?**

Answer: Humans are social animals and not being part of the social group risked our ancestors not surviving. During adolescence young people begin to develop bonds with their peers so that they can move from the family home to independent adult social groups. This means that not being excluded from their peer group, especially at this vital transition stage in development, was really important. In line with this importance, the teenage brain finds social information really rewarding, particularly if it comes from their peers. For better or worse, teenagers value the opinions of their peers really highly, sometimes even more than their own experience. This can be a really positive thing when working together to support each other.

**Additional readings and videos**

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| *Please note that the resources below are provided for teachers to strengthen their subject knowledge and explore the research base underpinning the lessons. These resources have not been through the PSHE Association’s quality assurance process.* |

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| **Topic** | **Resource, description, link** |
| **Differential susceptibility to stress in students** | *Students will have different pre-existing susceptibility to stress. The BReal material aims to emphasise (via the ‘stress buckets’ metaphor) that everyone’s stress levels – and how easily they get stressed – are different, but we’re aware that teenagers are inclined to compare themselves, and may wonder why their friends ‘cope better’ with seemingly the same stressors as them. Staff at the mental health charity Charlie Waller Trust have recommended the following resources on this topic:*  Dr Michael Pluess (Senior Lecturer in Developmental Psychology, Queen Mary University) and Jay Belsky (Professor of Child Development, UC Davis) discussing differential susceptibility: <https://www.youtube.com/watch?v=lxMDmLEOWkQ>  The “Dandelions, tulips, orchids” flower metaphor to describe different susceptibility levels is also explained in a video by Dr Tom Boyce, Professor of Paediatrics and Psychiatry, University of California: “Some children are biologically more sensitive to their environment”, <https://www.youtube.com/watch?v=1qPrVq2MfwE>  *Charlie Waller Trust staff also recommend emphasising to students that everyone is different in how long it takes to effectively implement stress resilience skills, and that appearances are never the whole story (someone appearing resilient may be struggling internally).* |
| **Resilience and growth mindset** | *You Are Awesome* book and resources by Matthew Syed. Book, PHSE lesson resources and teacher resources to help inspire and empower young readers to develop a growth mindset and find the confidence to realise their potential. |
| **Adolescent Neurodevelopment** | *The Incredible Teenage Brain: Everything You Need to Know to Unlock Your Teen's Potential* by Bettina Hohnen, Jane Gilmour, and Tara Murphy. Written by a team of clinical psychologists, the book guides readers through strategies to build strong relationships and improve communication with young people. Plus a podcast interview with the authors <https://www.youtube.com/watch?v=wdkDHXKlix0> |
|  | *Inventing Ourselves* book by Prof. Sarah-Jayne Blakemore. Written by world-leading developmental cognitive neuroscientist, the book describes how the adolescent brain transforms as it develops and shapes the adults we become. Here is a lecture from her book tour: <https://www.youtube.com/watch?v=yQXhFa8dRCI> |
|  | Why the teenage brain has an evolutionary advantage: <https://www.youtube.com/watch?v=P629TojpvDU>.  A short video from Prof. Adriana Galván at UCLA, that suggest teen behaviours like risk-seeking and their strong displays of emotions may actually be adaptive traits that help teens succeed. |
|  | Simple short video from Prof. Dan Siegel that describes how the brain changes in adolescence: <https://www.youtube.com/watch?v=0O1u5OEc5eY> |
| **Stress** | MTV American video of “How We Cope With Anxiety & Stress”. MTV’s Teen Code: could offer some discussion points on healthy and potentially unhealthy approaches to stress resilience: <https://www.youtube.com/watch?v=0qnYXCLk5bQ> |
|  | Article and video from the NIH MedlinePlus magazine that describes teenage stress and potential coping strategies <https://magazine.medlineplus.gov/article/teens-and-stress-when-its-more-than-worry>. Note a recent large-scale study has challenged the effectiveness of mindfulness in schools for teenagers ([wellcome.org/news/mindfulness-schools-doesnt-improve-mental-health-heres-why-thats-positive](http://wellcome.org/news/mindfulness-schools-doesnt-improve-mental-health-heres-why-thats-positive)) |
| **Social neuroscience of social group living** | New Scientist article on what influences the form and function of our social networks <https://www.newscientist.com/definition/dunbars-number/> |
| **Experiences of social isolation, the impact on the body, brain and mind** | “Locked Inside – The Neuroscience of Social Isolation”. A video created for the 2021 Brain Awareness Video Contest created by Lorena Ragonesi. It describes the impact of social isolation on brain and behaviour. <https://www.youtube.com/watch?v=iNQ6l6k8hBg> |
| **Plasticity** | Short video from Sentis that describes how the brain changes through neuroplasticity <https://www.youtube.com/watch?v=ELpfYCZa87g> |
| **Learning/behavioural flexibility** | Prof. Matthew Rushworth describes how the brain works when we are making decisions and the role of prefrontal cortex: <https://www.youtube.com/watch?v=D47eBlLb8Ag&t=172s> (includes animal research) |
| **Peer influence** | Prof. Daniel Siegel explains Why Teens Turn from Parents to Peers during adolescence: <https://www.youtube.com/watch?v=thxlUme7Pc8> |

**Short videos on areas of the brain discussed in the BReal material**

* 2-min neuroscience: Prefrontal cortex: <https://www.youtube.com/watch?v=i47_jiCsBMs>
* 2-min neuroscience: Basal Ganglia: <https://www.youtube.com/watch?v=OD2KPSGZ1No>
* 2-min neuroscience: Limbic system: <https://www.youtube.com/watch?v=LNs9ruzoTmI>
* 2-min neuroscience: Amygdala: <https://www.youtube.com/watch?v=JVvMSwsOXPw>
* 2-min neuroscience: Striatum: <https://www.youtube.com/watch?v=EEUxKFmIUiI>
* 2-min neuroscience: Reward system: <https://www.youtube.com/watch?v=f7E0mTJQ2KM>

# **Scientific Reviews on adolescent development for teachers and parents**

* Casey, B. (2019) Healthy Development as a Human Right: Lessons from Developmental Science. Neuron. 702, 725. [Full free access to article](https://www.cell.com/neuron/fulltext/S0896-6273(19)30298-3?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0896627319302983%3Fshowall%3Dtrue)
* Casey, B.J. Heller, A.S. Gee, D.G. & Cohen, A.O (2019) Development of the emotional brain. Neuroscience Letters. 693, 29-34. [Full free access to article](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5984129/)
* Steinberg L. (2008) A Social Neuroscience Perspective on Adolescent Risk-Taking. Developmental Research. 28: 78-106. [Full free access to article](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2396566/)
* Steinberg L. (2004) Risk Taking in Adolescence. What changes and why? Ann. N.Y. Acad. Sci 1021: 51-58. [Read the article’s abstract (summary) for free here](https://nyaspubs.onlinelibrary.wiley.com/doi/abs/10.1196/annals.1308.005?sid=nlm%3Apubmed)

**Scientific references for each lesson**

**Lesson 1**

* **Effects of stress on brain and body, note the benefits of stress**
* Yaribeygi, H. Panahi, Y. Sahraei, H. Johnston, TP. Sahebkar A. (2017). The impact of stress on body function: A review. *Excli Journal*. 16:1057-1072. [Full free access to article here](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5579396/)
* Chrousos, GP. Stress and disorders of the stress system. (2009) *Nature Rev Endocrinol*. 5: 374-81. [Abstract (summary) available for free](https://www.nature.com/articles/nrendo.2009.106)
* **Adolescent brain development, particularly connections between PFC and amygdala, in the context of stress**
* Mills KL., Goddings, A., Clasen, LS., Giedd, JN., Blakemore, SJ. (2014) The Developmental Mismatch in Structural Brain Maturation during Adolescence. *Dev Neuroscience*. 36:147-160. [Full free access to article here](https://www.karger.com/Article/FullText/362328)
* Gogtay, N. Giedd, J.N. Lusk, L. Hayashi, KM. Greenstein, D. Vaituzis, AC. Nugent, TF. Herman, DN. Clasen, LS. Toga, AW. Rapoport, JL. Thompson, PM. (2004). Dynamic mapping of human cortical development during childhood through early adulthood. *PNAS*. 101; 8174-8179. [Full free access to article here](https://www.pnas.org/doi/10.1073/pnas.0402680101?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub++0pubmed)
* Romeo, RD. (2016) The impact of stress on the structure of the adolescent brain: Implications for adolescent mental health. *Brain Research*. 1654:185-191. [Abstract (summary) available for free](https://www.sciencedirect.com/science/article/abs/pii/S0006899316301482?via%3Dihub)
* Tottenham, N. & Galvan, A. (2016) Stress and the adolescent brain: Amygdala-prefrontal cortex circuitry and ventral striatum as developmental targets. *Neuroscience Biobehavioural Review*. 70:217-227. [Full free access to article here](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5074883/)
* Teicher, MH. & Samson, AJ. (2016) Annual Research Review: Enduring neurobiological effects of childhood abuse and neglect. *Journal of Child Psychology and Psychiatry*. 57:241-266. [Full free access to article here](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4760853/)
* **Practice effects on the brain during adolescence i.e. plasticity.**
* Selemon, LD. (2013) A role for synaptic plasticity in the adolescent development of executive function. *Translational Psychiatry*. 3:e238. [Full free access to article here](https://www.nature.com/articles/tp20137)
* Konstantoudaki, X. Chalkiadaki, K. Vasileiou, E. Kalemaki, K. Karagogeos, D. Sidiropoulou, K. (2018) Prefrontal cortical-specific differences in behavior and synaptic plasticity between adolescent and adult mice. [Full free access to article here](https://journals.physiology.org/doi/full/10.1152/jn.00189.2017?rfr_dat=cr_pub++0pubmed&url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org)
* **Noticing worries and your body’s response to stress helps you learn how best to deal with them** (Psychoeducation is a core component of Cognitive Behaviour Therapy (CBT), the first line treatment for anxiety in young people, as recommended by the National Institute of Health and Care Excellence (NICE))
* James, A. C., Reardon, T., Soler, A., James, G., & Creswell, C. (2020). Cognitive behavioural therapy for anxiety disorders in children and adolescents. *Cochrane database of systematic reviews*, (11). [Full free access to article here](https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD013162.pub2/full#CD013162-sec-0014)

**Lesson 2**

* **Learning from success and mistakes, classical conditioning and instrumental conditioning**
* *Pavlov IP (1960) [1927].*[*Conditional Reflexes*](http://psychclassics.yorku.ca/Pavlov/)*. New York: Dover Publications. Archived from the original on 2020-09-21. Retrieved 2007-05-02.* (The 1960 edition is not an unaltered republication of the 1927 translation by Oxford University Press). [Full free access here](https://web.archive.org/web/20200921213926/http:/psychclassics.yorku.ca/Pavlov/)
* Rescorla RA, Wagner AR (1972). ["A theory of Pavlovan conditioning: Variations in the effectiveness of reinforcement and nonreinforcement."](https://archive.org/details/classicalconditi0000unse). In Black AH, Prokasy WF (eds.). *Classical Conditioning II: Current Theory and Research*. New York: Appleton-Century. pp. [64–99. Not available for free online.](https://archive.org/details/classicalconditi0000unse/page/64)
* Thorndike, EL (1933). A proof of the Law of Effect. *Science* 77, 173–175 (1933). [Abstract (summary) available for free](https://psycnet.apa.org/record/1933-01793-001)
* **What happens in the brain when we learn; dopamine signalling and the striatum**
* Schultz, W. (2000). Multiple reward signals in the brain. *Nat Rev Neurosci*, 1(3), 199-207. [Key points and abstract (summary) available for free](https://www.nature.com/articles/35044563)
* Schultz, W., Dayan, P., & Montague, P. R. (1997). A neural substrate of prediction and reward. *Science*, 275(5306), 1593-1599. [Abstract (summary) available for free](https://www.science.org/doi/10.1126/science.275.5306.1593?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed)
* Schultz, W., & Dickinson, A. (2000). Neuronal coding of prediction errors. *Annu Rev Neurosci*, 23, 473-500. [Abstract (summary) available for free](https://www.annualreviews.org/doi/10.1146/annurev.neuro.23.1.473?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub++0pubmed)
* **Flexible behaviour and the PFC; Learning signals in PFC and flexible behaviour**
* Rushworth, MFS, Noonan, MP, Boorman, ED., Walton, ME., Behrens, TE. (2011) Frontal cortex and reward-guided learning and decision-making. *Neuron*. 70:1054-69 [Full free access to article here](https://www.cell.com/neuron/fulltext/S0896-6273(11)00395-3?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0896627311003953%3Fshowall%3Dtrue)
* **Why making mistakes is important; computers make mistakes to make good decisions in the long term**
* Sutton and Barto (2015). *Reinforcement Learning: An Introduction.* MIT Press. [Full free access to book here](https://web.stanford.edu/class/psych209/Readings/SuttonBartoIPRLBook2ndEd.pdf)
* **Delayed maturation of PFC across adolescence means it remains plastic**
* Mills KL., Goddings, A., Clasen, LS., Giedd, JN., Blakemore, SJ. (2014) The Developmental Mismatch in Structural Brain Maturation during Adolescence. *Dev Neuroscience*. 36:147-160 [Full free access to article here](https://www.karger.com/Article/FullText/362328)
* Goddings, A. Roalf, D. Lebel, C. Tammes, CK. (2021) Development of white matter microstructure and executive functions during childhood and adolescence: a review of diffusion MRI studies. *Developmental Cognitive Neuroscience*. 51:101008. [Full free access to article here](https://www.sciencedirect.com/science/article/pii/S1878929321000980?via%3Dihub)
* **Practice strengthens PFC-PFC connectivity**
* Sallet J, Noonan MP, Thomas A, O’Reilly JX, Anderson J, Papageorgiou GK, et al. (2020) Behavioral flexibility is associated with changes in structure and function distributed across a frontal cortical network in macaques. *PLoS Biol* 18(5): e3000605. [Full free access to article here](https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000605)
* **Growth mindset to support learning**
* Yeager, D. S., & Dweck, C. S. (2020). What can be learned from growth mindset controversies? *American Psychologist*, 75(9), 1269. [Full free access to article here](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8299535/)
* **Changing our behaviour can change how we feel** (Facing fears through exposure is a core component of Cognitive Behaviour Therapy (CBT), the first line treatment for anxiety in young people, as recommended by the National Institute of Health and Care Excellence (NICE))
* James, A. C., Reardon, T., Soler, A., James, G., & Creswell, C. (2020). Cognitive behavioural therapy for anxiety disorders in children and adolescents. *Cochrane database of systematic reviews*, (11). [Full free access to article here](https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD013162.pub2/full)
* Creswell, C., Waite, P., & Hudson, J. (2020). Practitioner Review: Anxiety disorders in children and young people–assessment and treatment." *Journal of Child Psychology and Psychiatry* 61.6: 628-643. [Full free access to article here](https://acamh.onlinelibrary.wiley.com/doi/10.1111/jcpp.13186)
* Ale, C. M., McCarthy, D. M., Rothschild, L. M., & Whiteside, S. P. (2015). Components of cognitive behavioural therapy related to outcome in childhood anxiety disorders. *Clinical Child and Family Psychology Review*, 18(3), 240-251. [Abstract (summary) available for free](https://pubmed.ncbi.nlm.nih.gov/26001645/)

**Lesson 3**

* **The stress bucket – strategies to relieve stress in adolescents** (This model was developed originally by clinicians working with individuals with psychosis to help understand the stress-vulnerability model, where the stress bucket is filled and overflowing - but has subsequently been applied to individuals more generally)
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