



Rethinking Adolescence: **Integrating neuropsychological insights with person-centred, trauma-informed responses**

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This paper summarizes key learnings from research on the adolescent brain, focusing on its rapid development and adaptive capacity. Adolescence is an especially complex time and is often characterised by behaviours and emotions that may be unpredictable and that change rapidly. Risk-taking, reward seeking, impulsivity and challenging of norms and rules are functionally important and developmentally appropriate for adolescents as they develop their critical thinking skills over time.

Similarly, an emphasis on social relationships and a need for stimulation are developmentally appropriate. Adverse circumstances, including violence perpetrated by others, can have an impact on the development of the adolescent brain, with the result that some of these behaviours might become more pronounced or might present as challenges for caregivers, educators, policymakers and various practitioners.

These behaviours, sometimes labelled as 'problematic' – particularly when they transgress norms, result in conflicts or cause adolescents to harm themselves or others – tend to elicit punitive and pathologizing responses, without taking into account adolescent developmental processes as well as potential exposure to adversity, violence and/or trauma. This paper explores these developmental processes and suggests that adaptability of the adolescent brain can be harnessed to aid recovery and improve practices across sectors such as law, health, social protection, and education, with the ultimate goal of supporting adolescents' capabilities to thrive.

Key concepts

Disability:

According to the Convention on the Rights of Persons with Disabilities, a person with a disability has a long-term physical, mental, intellectual or sensory impairment which, in interaction with various barriers, may hinder their equal participation in society.¹ Physical disabilities arise out of barriers based on a person's physiological capabilities, whereas developmental disabilities include limitations in function resulting from the developing nervous system, which is why they may also be referred to as neurodevelopmental disabilities.²

Evolving capacities:

A term that recognizes the fact that, as children transition into adolescence and then adulthood, there are physiological as well as cognitive and social changes which are unique to each person. This process of development involves shifting states of autonomy, ability to make informed choices and changes to limits and expectations in relation to caregivers, educators and society in general.³ In neuroscientific terms, evolving capacities also means the evolving ability to activate, regulate and connect between various parts of the brain in a manner that is not over-reliant on any one network or centre.⁴

Hyperarousal:

In neuropsychological terms, hyperarousal refers to over-stimulation of the emotion-focused regions of the brain, which may present as features such as hypervigilance, anxiety, irritability, hypersensitivity or extreme fear. There is a significant association between exposure to adverse, violent and/or traumatic experiences and hyperarousal responses.⁵

Hypoarousal:

This refers to decreased activity in the emotion-focused regions of the brain, often coupled with increased activity in the areas where rumination occurs. Those who experience hypoarousal present as 'blunted' or 'disengaged' in their affect.⁶ Hypoarousal is a feature of trauma response in some people.⁷

ICD-11:

The eleventh edition of the International Classification of Diseases, a taxonomy of clinical syndromes and their constituent symptoms, published by the World Health Organization.⁸

Negative affectivity:

Forms part of the ICD-11 diagnosis of a personality disorder,⁹ but may also be utilized to describe emotional states that do not meet a clinical threshold but are nonetheless experienced negatively by the individual, including intense sadness, anger, fear, shame or anxiety. The intensity and frequency of an individual's experience of negative emotion; along with the volatility of such emotional states; the individual's reactivity; and the risks that may be taken as a result of these emotional states are gauges of that person's affectivity.¹⁰

Neuroplasticity:

Neuroplasticity refers to the brain's ability to modify, change, and adapt both structure and function in response to experience. Mechanisms of neuroplasticity show significant variability across individuals. Historically, neuroscience has emphasized early childhood as a period of extraordinary plasticity, but evidence increasingly points to adolescence as a 'second interval' in which the brain adapts with rapidity and frequency.¹¹

Resilience:

Resilience refers to the capacity to react to challenges in a supportive or adaptive way. In the context of this paper, resilience is a capacity – whether innate or fostered through supportive processes - that is associated with an individual's reaction to adverse circumstances which may alter the potential neurodevelopmental damage associated with one's reaction to an event, stimulus or circumstance. It is closely linked to neuroplasticity, in that the adaptability of the adolescent brain shows significant potential for altering behaviours and reactions to stimuli with appropriate support.¹²

Trauma/traumatic experiences/complex trauma:

This refers variously to the diagnosis of post-traumatic stress disorder (PTSD) as per the ICD-11,¹³ or to experiences which may be perceived as stressful by an individual regardless of the diagnostic implications (ie. A person may experience trauma, but not necessarily be diagnosed with PTSD). There is a strong association between trauma and adverse or violent experiences, although this may manifest differently in different people.¹⁴ The term 'complex' trauma refers to multiple experiences that may combine to contribute to an individual's experience of trauma, a situation in which an individual faces significant challenges that might actually reinforce trauma or a situation where an individual perceives no realistic form of 'escape' from a stimulus.¹⁵

Trauma-informed:

Often used in the mental health field, but it can also be utilized more broadly in all human service settings to recognize an obligation and responsibility to ensure that all practices do not contribute to trauma (ie. Preventing trauma) as well as a responsibility to respond appropriately and empathetically to trauma when it is observed.¹⁶ Trauma-informed services may include psychosocial support but they may also include adaptations in facilities, curriculums, media outlets and policies that recognize the need to alleviate existing trauma and prevent traumatization, re-traumatization or secondary traumatization through interactions with systems.¹⁷

1. Adolescent development

Adolescence is an especially transformative period, characterized by rapid changes in physical, social and cognitive development. Legally, adolescence is a specific period within the scope of the legally defined concept of childhood, which is defined by the Convention on the Rights of the Child (CRC) as the period between ages 0 and 18.¹⁸ Behaviourally, adolescence is also a period of significant change, including completing core developmental ‘tasks’ that will support maturation into adulthood. It is important to note that many of these developments are also moderated by cultural and social norms that may shift how these ‘tasks’ are navigated by adolescents and parents alike. These ‘tasks’ are summarized in Table 1 below.

Table 1
Key developmental tasks of adolescence

Developmental ‘task’	Description
Adjusting to sexually maturing bodies and feelings	Adolescents are faced with adjusting to bodies that as much as double in size and that acquire sexual characteristics. This includes learning to manage the accompanying biological changes and sexual feelings and developing the capacity to engage in healthy sexual behaviors. Their task also includes establishing a sexual identity and developing the skills for romantic relationships
Developing and applying abstract thinking skills	Adolescents typically undergo profound changes in their way of thinking, allowing them to more effectively understand and coordinate abstract ideas, to think about possibilities, to try out hypotheses, to think ahead, to think about thinking, and to construct philosophies
Developing and applying a more complex level of empathizing	Adolescents typically acquire a powerful new ability to understand human relationships, in which, having learned to ‘put themselves in another person’s shoes,’ they learn to take into account both their perspective and another person’s at the same time, and to use this new ability in resolving problems and conflicts in relationships
Developing and applying new coping skills	Related to all these dramatic shifts, adolescents are involved in acquiring new abilities to think about and plan for the future, to engage in more sophisticated strategies for decision making, problem solving, and conflict resolution, and to moderate their risk taking to serve goals rather than jeopardize them
Identifying meaningful moral standards, values and belief systems	Building on these changes and resulting skills, adolescents typically develop a more complex understanding of moral behavior and underlying principles of justice and care, questioning beliefs from childhood and adopting more personally meaningful values, religious views, and belief systems to guide their decisions and behaviour

Understanding and expressing more complex emotional experiences	Also related to these changes are shifts for teens toward an ability to identify and communicate more complex emotions, to understand the emotions of others in more sophisticated ways, and to think about emotions in abstract ways
Forming friendships that are mutually close and supportive	Adolescents generally develop peer relationships that play much more powerful roles in providing support and connection in their lives. They tend to shift from friendships based largely on the sharing of interests and activities to those based on the sharing of ideas and feelings, with the development of mutual trust and understanding
Establishing key aspects of identity	Identity formation is in a sense a lifelong process, but crucial aspects of identity are typically forged during adolescence, including developing an identity that reflects a sense of individuality as well as connection to valued people and groups. Another part of this task is developing a positive identity around gender, physical attributes, sexuality, and ethnicity and, if appropriate, having been adopted, as well as sensitivity to the diversity of groups that make up society
Meeting the demands of increasingly mature roles and responsibilities	Adolescents gradually take on the roles that will be expected of them in adulthood, learning to acquire the skills and manage the multiple demands that will allow them to move into the labour market, as well as to meet expectations regarding commitment to family, community, and citizenship
Renegotiating relationships with adults in parenting roles	Although the task of adolescence has sometimes been described as 'separating' from parents and other caregivers, it is more widely seen now as adults and teens working together to negotiate a change in the relationship that accommodates a balance of autonomy and ongoing connection, with the emphasis on each depending in part on the family's ethnic background

Adapted from Simpson AR (2001). Raising teens.¹⁹

To facilitate much of this development, rapid changes in the brain take place during adolescence through to the mid-20s. This has an impact on maturation across regions of the brain responsible for processing risks, rewards, impulse control, and critical thinking, resulting in what is known as maturational imbalance.²⁰ The imbalance being referred to here concerns the areas of the brain that process emotions and those that emphasize reasoning and critical thinking. The latter develop stronger connectivity later, and in the interval, adolescent behaviour may be erratic, impulsive or emotionally 'charged'. This is not abnormal – all adolescents will likely face some difficulty in navigating these complexities, and what is often described as 'rebellious', 'disruptive' or even 'problematic' behaviour may be part of the developmental process.

Conflicts with caregivers, educators and others in positions of authority may arise as maturation occurs, in part because development of critical thinking facilitates development towards fully-fledged adulthood, while a desire for autonomy and agency is a necessary developmental step to meet the demands of the 'tasks' outlined above. Similarly, by nature, adolescence is a time when curiosity and the need for experimentation and the value of experience is heightened, and this can include expressions that adults may find 'problematic' or 'rebellious'. The extent to which these behaviours are, in fact, problems is a feature of debate, predicated on cultural and political norms and subject to variations in context.²¹ While all adolescents may challenge boundaries,

seek greater agency and question authority, the line between what constitutes adaptive or typical infractions and what becomes a challenging behaviour is not always clear and unnecessary stigmatization of adolescent behaviour must be avoided.

It is important to recognize that as adolescents mature, their desire to be participants in decisions affecting their lives will also evolve. Similarly, all adolescents display a need for stimulation and a need to learn (along with a growing capacity to learn). It is part of the developmental process to struggle when an adolescent feels bored or unstimulated. Many behaviours that are stigmatized and seen as challenging by adults are, in fact, developmentally appropriate for the phase of life adolescents are in, and this requires that an adolescent-centred approach to development is adopted, in which all aspects of the adolescent's life and behaviour are taken into account to form a holistic picture of their development and their identity and personality, which will naturally and appropriately evolve over time.

Box 1

Adolescent development and the capacity to thrive

This paper recognizes that developmental processes cannot be separated from their context and from the experiences which any child faces. In other words, the course of an adolescent's brain development will depend on the child's circumstances, and on the needs that arise as a result of those circumstances, including adaptation and survival needs. For instance, an adolescent displaying anxiety may have developed this trait as a survival mechanism in response to growing up in anxiety-inducing conditions, and in the context of such conditions, that might be considered adaptive. However, if those circumstances can be altered to support the adolescent in such a way that does not contribute to their distress, such adaptations would not be necessary in the first place, and this must be recognized and addressed. Nevertheless, it is fundamental that we recognize that all adolescents possess the capacity to thrive if afforded the opportunity. This encompasses receiving adequate resources and support to foster their development into autonomous, self-regulating, and prosocial individuals who are not only mentally and physically healthy but also equipped for a long and fulfilling life. Where circumstances militate against this innate capacity to thrive, there is a clear need for the attention of duty-bearers, whether to address individual needs or to address systemic concerns that constitute structural barriers to wellbeing.

This paper actively avoids labelling adolescents as 'normal' or 'abnormal'. Instead, the emphasis is on the obligation of duty bearers to take into account and act in ways that are supportive of the innate capacity of all adolescents to thrive when the environments and circumstances support this. Thriving may look different in different contexts, and this too should be acknowledged and understood, but the obligation of duty bearers remains the same – to support the universal right of adolescents, as stated in the Convention on the Rights of the Child, to grow up in 'an atmosphere of happiness, love and understanding'.

Actionable Guidance for Policy and Practice:

Identify and Mitigate Barriers:

Duty-bearers must proactively identify and mitigate systemic and individual barriers that impede the capacity of adolescents to thrive. This includes ensuring equitable access to educational, healthcare, and social resources.

Adopt a Contextual Approach to Development:

Policies and practices should be flexible enough to adapt to the diverse needs of all adolescents, recognizing that developmental milestones may vary widely due to differing life circumstances.

Encourage Holistic Developmental Support:

A comprehensive approach should be taken to support the physical, emotional, social, and cognitive development of adolescents, facilitating environments that nurture rather than stigmatize.

This perspective aims to foster a more inclusive and equitable approach to understanding and supporting the development of adolescents, recognizing the complex interdependence of individual characteristics and environmental influences. A life course perspective is also essential, as this perspective underscores the point that intergenerational effects (ie. The experience of wellness or lack thereof between generations) may contribute to developmental outcomes, including the immediate experience of thriving and an adolescent's own future potential to thrive.

Recognizing the developmentally appropriate nature of many adolescent behaviours, when teens experience adversity, violence or traumatic events, development may be disrupted, imbalances may occur and challenges may arise. The behavioural correlates of adversity, violence and/or trauma can be difficult for systems to deal with, at times because they are perceived as 'problems' and met with segregation from society rather than rehabilitation with a trauma-informed lens that recognizes the inherent potential that neuroplasticity (ie. The ability of the brain to adapt) represents. Justice, education, welfare and health sectors can and should reconsider how they engage with adolescents displaying so-called 'problematic' behaviours and should take into account the individual's experience of adversity, violence and/or traumatic life events which may have given rise to such behaviours.

Box 2

Conceptualizing adversity, violence and/or traumatic experiences

Adversity, violent, and/or traumatic experiences are used in this paper as a broad framework to conceptualize difficult events in the lives of adolescents. There is no universal definition of an 'adverse, violent and/or traumatic experience', and the majority of the research that has focused on these topics has been conducted in high-income countries.²² Much of this research has culminated in studies on adverse childhood experiences (ACES),^{23, i} further developed into theories of 'expanded ACES' accounting for proximal community effects,^{24, ii} and accompanying child post-traumatic stress disorder (PTSD) theory^{25, iii}

'Violence', instead, has a legal definition, whose boundaries are defined by the Convention on the Rights of the Child, as including both mental and physical violence as well as neglect and negligent treatment.^{iv} The recognition of violence entails paying due attention to the role of perpetrators of violence, as well as a broad obligation for any professional who comes in contact with children to prevent violence (including to prevent secondary victimization) from occurring and to provide support for the recovery of any child, including adolescents, who has experienced violence.

- i** Physical abuse; sexual abuse; emotional abuse; living with a person with a mental health condition; being witness to domestic violence; living with a substance user; having a household member incarcerated; having one or no parents; and experiencing physical or emotional neglect.
- ii** Being witness to violence, subjective feeling of discrimination, living in an unsafe neighbourhood, experience of peer violence and living in foster care
- iii** Motor vehicle or other accidents, natural disasters, explosions/war, media/entertainment violence, separation or loss of family or non-family members
- iv** Art. 19, Convention on the Rights of the Child (1989).

Moreover, while the list of ACES and expanded ACES contain a number of important considerations, adolescent participation and adolescent-identified stressors need further consolidation and investigation,²⁶ taking into account the traumatic impact of socioeconomic factors such as poverty;²⁷ geographically or situationally disparate bases for adversity - such as cultural attitudes towards the status of adolescents,²⁸ child marriage and traditional practices such as female genital cutting;²⁹ refugee status and the accompanying experience of immigration detention;³⁰ and lack of shelter³¹ among others. Evolving root causes of adversity, including the relationship between young people and digital spaces,³² school environments,³³ the COVID-19 pandemic and subsequent hardships,³⁴ and climate change³⁵ have also been shown to be experienced adversely by adolescents.

Recognizing that these experiences are multifaceted and occur in context, there is a need to acknowledge that gender is a major determinant of how adversity, violence and potential trauma are experienced and in the particular risks that women and girls face, including discrimination and cultural norms that might culminate in adverse experiences including gender-based violence.³⁶ Methods of coping with adversity, violence and/or traumatic experiences may also be gendered in nature because of social norms that 'allow' adolescent males to express distress through aggression, 'disallowing' other expressions of vulnerability, while research indicates that adolescent females are less likely to use aggressive expressions because of prevailing norms, instead expressing distress through methods such as self-harming behaviours.³⁷ For both adolescent boys and girls, gendered assumptions about manifestations of distress and/or occurrence of violence can create notable barriers to meaningful access to services. These are not universally true phenomena, but cultural norms and how they impact manifestations of distress are vital to consider. Similarly, discrimination (experienced subjectively) is contained in the list of expanded ACES, while other research has also shown that racial and ethnic discrimination,³⁸ discrimination on the basis of sexual orientation, gender identity or expression (SOGIE),³⁹ disability,⁴⁰ immigration status,⁴¹ health status,⁴² religion and culture,⁴³ and other characteristics can be experienced as traumatic.

Exposure to adversity, violence and/or trauma is experienced subjectively and affected by processes of equifinality (in which different experiences can lead to similar outcomes) and multifinality (in which the same experience may produce varied outcomes), potentially mediated by individual resilience.⁴⁴ Nevertheless, it is also important to note that not all adverse, violent and/or traumatic experiences are similar in terms of magnitude or extremity,⁴⁵ that some researchers suggest most children will likely be exposed to some form of adversity in their lives⁴⁶ (and that tolerable exposure may support the fostering of resilience)⁴⁷ and that the traumatic implications of experiences should be viewed on a continuum, which acknowledges that a clinical diagnosis of PTSD is only one possible outcome and may not occur for many individuals.

The concepts of 'cumulative' childhood adversity and poly-victimization are also important to note, as research indicates that the 'number' or 'quantity' of difficult experiences faced by a child or adolescent simultaneously is significantly associated with subjective experiences of adversity, more so than the 'type' or 'nature' of experiences, thus contributing to the 'cumulative' intensity of negative experience.⁴⁸

While some efforts have been made to 'measure' and thus quantify cumulative adversity, research suggests this is not always of utility because of the multifaceted nature of adverse experiences.⁴⁹ Instead, this paper focuses on the continuum approach to adversity, violent and/or traumatic experiences and their behavioural correlates. Ultimately, the aim is not to produce an analysis focused on what constitutes adverse, violent and/or traumatic experiences but, instead, to focus on how they impact adolescents and what systems can do to recognize and address them (including through policy and practice changes as articulated in the accompanying paper).

The aim of this paper is to apply findings from neuroscience and neuropsychology in the context of adolescent development to inform a more adolescent-centred understanding of behaviours that might be labelled as 'problems' but might serve a developmental or adaptive need for an adolescent. The paper aims to illustrate that labelling adolescents who display behaviours which might be in conflict with norms of society as 'lost causes' is unnecessary and unhelpful, particularly given the window of opportunity that adolescence represents. Instead, a trauma-informed approach is of utmost importance in all sectors, recognizing that no adolescent is a 'lost cause' but can be supported to regain potential that may have been compromised on account of adverse, violent and/or traumatic experience.

2. Understanding brain development: Structural/regional and network perspectives

Individual brain structures are linked to specific functions, such as the limbic system for emotional processing or the prefrontal cortex for reasoning and self-regulation. Interconnectedness of different brain regions (ie. Neural networks) and the interaction between them also affect neurological processes.⁵⁰ Maintaining balanced interaction between networks is a core developmental task, and external stimuli can contribute to the connectivity between networks.⁵¹ The networks mentioned in Box 3 are key for understanding the network perspective, which highlights that adversity, violence and/or traumatic experiences often involve the activation of specific brain regions and 'suboptimal' connections within or between networks.

Box 3

Large-scale neural networks of particular relevance

Central Executive Network (CEN):

The Central-Executive Network is a set of regions more active during external cognitive tasks, including those related to navigation of social situations. Its major nodes include the dorsolateral prefrontal cortex and the lateral posterior parietal cortex. The CEN maintains information in working memory and is also responsible for decision-making and complex problem-solving. In addition to involvement in practical decision-making, the CEN is also implicated in processing necessary for effective emotional regulation.⁵²

Default Mode Network (DMN):

The default mode network is a coordinated network of brain regions thought to be active when an individual is at rest and deactivated when an individual is engaged in focused task-based behavior. The posterior cingulate cortex, precuneus, medial prefrontal, and inferior parietal cortices are thought to be parts of the DMN. This part of the brain can contribute to self-awareness and self-referential behavior, but, while it is considered a 'default' or 'rest' mode, activation in this area is also considered to be associated with ruminative thoughts which may trigger emotional distress or may elicit behaviours to obtain relief, including substance use.⁵³

Saliience Network (SN):

The saliience network is a collection of brain regions working in concert to evaluate the importance of internal or external stimuli and to assist in the coordination of the brain's response. It is anchored in the anterior insula (AI) and dorsal anterior cingulate cortex and includes key subcortical structures: the amygdala, the ventral striatum and the and the substantia nigra/ventral tegmental area. An overactive SN is thought to be associated with experiences of distress, with a state of hyperarousal and heightened sympathetic/noradrenergic activity (ie. Fight, flight, freeze), particularly involving significant disinhibition and negative affectivity, including propensity to risk behaviours.⁵⁴ While the saliience network is not the only part of the brain that regulates or processes emotions, it is considered to be particularly active in acute stress.⁵⁵

3. Key processes in adolescent development, their relationship with behaviour and implications of adversity, violence and/or traumatic experiences

A significant portion of our understanding about adolescents is often rooted in stereotypical assumptions about the influence of puberty on behaviour, impulse-control, decision-making, personality and emotions. Advances in science now allow us to consider the interplay between brain development and adolescent behaviour, recognizing the rapid changes taking place on an almost daily basis inside the adolescent brain, as well as understanding the impact of adverse, violent and/or traumatic experiences on behaviour. This can and should shape appropriate responses in future. The paper proceeds by examining needs of adolescent development that will support the fulfilment of the tasks of adolescence, with an examination of the impacts of adverse, violent and/or traumatic experiences on those needs.

3.1.

Development of emotional regulation, decision-making, impulse control and higher order executive functioning



Key message:

As adolescents grow, their ability to think critically and to make considered decisions and regulate their emotions grows too. But during adolescence, some of these skills will still be developing and teens will take risks, may be motivated by quick rewards and may engage in impulsive behaviours. If disruption in maturation occurs, the tendency towards impulsive behaviours may become more pronounced or prolonged.

The emotional centre of the brain typically matures and experiences connection to other parts earlier than other areas, giving rise to reliance on 'emotional' decision-making. By contrast, areas responsible for self-regulation, critical thinking and executive level functioning (such as complex decision-making), develop later as part of the maturational imbalance. All of this leads to heightened emotional reactions. Research also suggests that, during adolescence, there may be particular sensitivity in the brain regions that regulate risk and reward.⁵⁶ In this context, 'reward' is thought to be both the reduction of distress as well as the experience of pleasure. Behaviourally, adolescents are more likely to take risks to achieve rewards, and more likely to seek immediate pleasure or relief sensations because of the 'peak' availability of dopamine – the neurotransmitter that contributes to motivation - in the adolescent brain.⁵⁷ Research shows that heightened drive for rewards is specific to immediate rewards and not those that require a waiting period,⁵⁸ thus contributing to impulsive behaviours.

Much of this imbalance and the behaviours associated with it are adaptive and developmentally appropriate.⁵⁹ Importantly, even a 'typical' adolescent might experience challenges with self-regulation and critical decision-making, although there is an expectation that this will resolve over time as the reasoning centre 'catches up' with the emotional centre. However, those exposed to adverse, violent and/or traumatic experiences may face particular struggles because of prolonged redirection of resources to meet 'survival' needs, thus impacting development and the actual experience of thriving.⁶⁰ The ability to regulate one's behaviour might ordinarily be predicted to improve over time. However, it remains a challenge in those experiencing distress because

of developmental disruption, potentially giving rise to behaviours which are then considered 'problems' when life history is not taken into account.⁶¹

A lot of them use those [drugs] so that they should forget their problems which they are going through in their lives like not given food, being called different names... so she just uses drugs to forget problems about her life.

Quote from an adolescent, taken from UNICEF. (2021). On My Mind⁶²

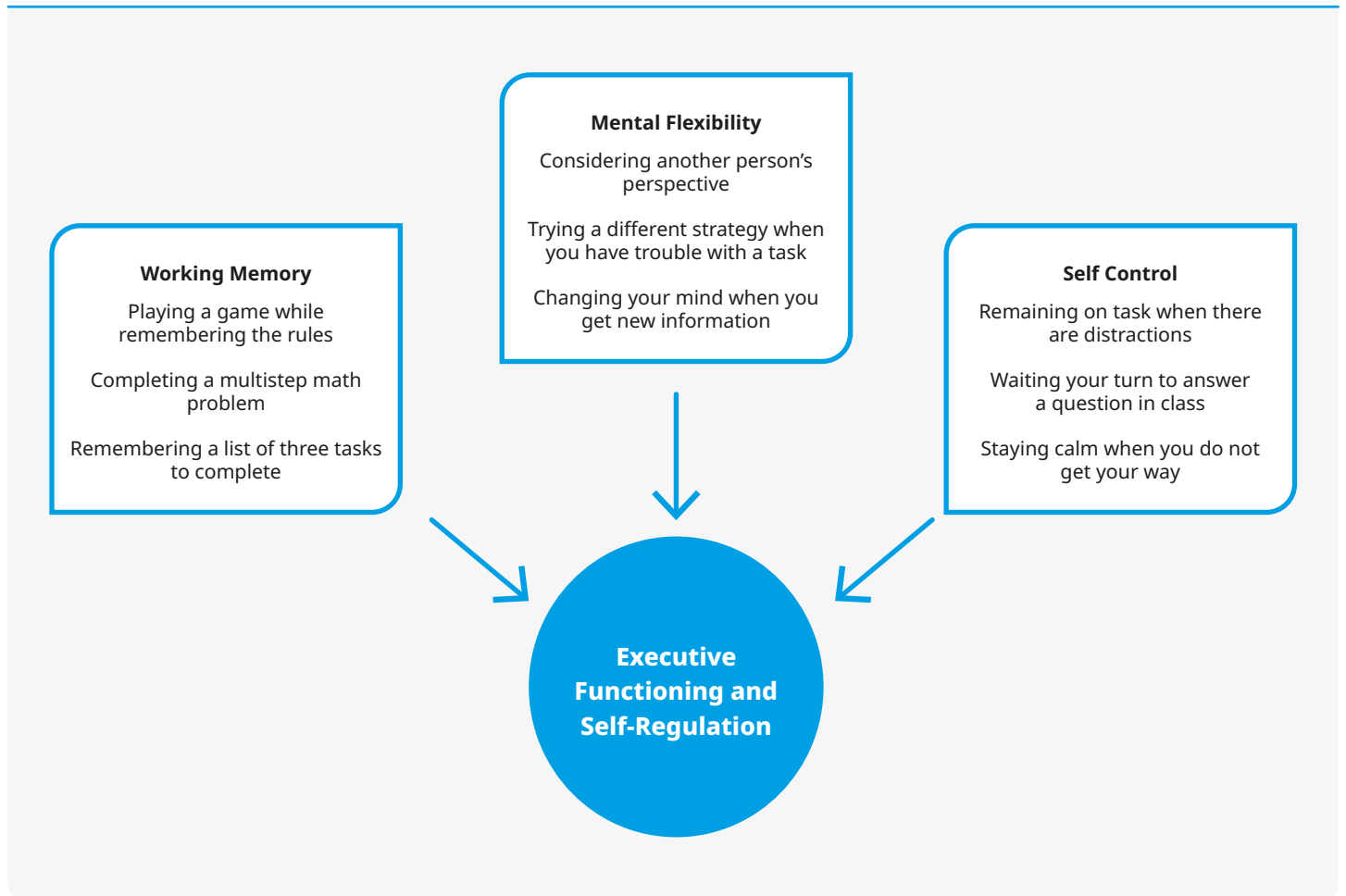


Figure 1: Components and accompanying examples of executive functioning and self-regulatory capacities

Behaviours associated with inhibited self-regulation include heightened and prolonged reward-seeking and risky behaviours such as substance use; potential for erratic behaviours that might be considered 'uncontrollable' (this may be mediated by social gender norms with boys exhibiting different behaviours to girls on account of what is socially accepted); and difficulty with critical thinking that might contribute to academic challenges.⁶³ Hyperaroused responses can also contribute to aggressive or self-harming behaviours,⁶⁴ while efforts to address distress, coupled with impulsivity and risk-taking, can contribute to self-harming behaviours.⁶⁵ There is also a stronger association with these behavioural outcomes among adolescents who experience violence or other adverse events earlier in life.⁶⁶ Structurally, cerebellar and hippocampal brain volume is also less developed in adolescents who have experienced adverse, violent and/or traumatic experiences – particularly in early life – which impacts the ability to coordinate motor functioning as well as reasoning.⁶⁷ Hyperarousal is a common feature of traumatic experiences,

which in adolescents would further correlate with challenges in other functions such as critical thinking. In hypoaroused responses – characterized by blunted affect and rumination – there may also be detrimental impacts on executive level functioning.⁶⁸

[There is] a lot of self-harming, even causing death...There is a lot of that in our age group, especially due to low self-esteem, family problems, harassment and that kind of thing, they are serious problems and I feel that this is very latent nowadays, especially for women.

Quote from an adolescent taken from UNICEF. (2021). On My Mind⁶²

For survival in the context of an adverse, violent and/or traumatic event, redistribution of resources to a particular network - or what might be termed 'suboptimal' connectivity - may be adaptive under the circumstances (for example, being hypervigilant might be necessary if one is to survive the experience of war), but their impacts can affect the life course. There is a need for further research to differentiate neurodevelopmental correlates of divergent PTSD presentations, but varying presentations do nonetheless demonstrate imbalances that preclude thriving disrupt the development of self-regulatory capacities.⁶⁹



Key message:

Friendships, romantic relationships and other peer interactions are especially important and can be especially intense during adolescence. Teens can be motivated by the rewards they experience in these relationships, and may be influenced by these interactions (ie. Peer pressure). While all adolescents experience these motivations to some degree, the impact of adversity, violence and/or traumatic experiences may be to prolong or intensify their impact, and potentially to contribute to engagement in behaviours that are stigmatized or labelled as 'problems'.

The part of the brain associated with social interactions, approval-seeking from peers and sensitivity to social feedback is especially active during adolescence.⁷⁰ Friendship is an essential part of this phase of life, and can be characterized as a core developmental need.⁷¹ Social status is also an important source of value to all adolescents, as a natural developmental condition.⁷² Parts of the brain's reward system are active in determining in-group and out-group distinctions during adolescence, and this may regulate how young people associate themselves or experience exclusion.⁷³ Research also shows that the experience of social rejection can trigger extreme emotional reactions along with potentially self-harming behaviours, even in 'typical' adolescents.⁷⁴ Conversely, the experience of social acceptance can have the effect of reducing distress.⁷⁵ When interacting with others and making decisions, adolescents are more likely than adults to be swayed by their emotions, thus drawing upon the emotional centre as part of their decision-making and motivation.⁷⁶ These findings speak to an adaptive process that is a natural part of development, but it can lead to behaviours that are then considered 'problems' if one's need for social approval overwhelms critical reasoning ability, is associated with violent or other behaviours that are transgressive in nature; contribute to self-harming or become a source of significant preoccupation. Adolescents are most likely to engage in behaviours that transgress social norms and boundaries between the ages of 17 and 19.⁷⁷ Only a small percentage actually go on to escalate this activity over the age of 19.⁷⁸ This illustrates that a number of behaviours that are unnecessarily stigmatized may be part of the growth and development process, although the response to them may contribute to better or worse outcomes (as described in section 4 below).

It becomes an obsession. If she falls below the bar, for example, of seven hundred likes, well, she has to find [a follower] to subscribe [so she] removes pictures that do not get enough likes. It's...it's an obsession.

Quote from an adolescent taken from UNICEF. (2021). On My Mind⁶²

The ability to express oneself, communicate with others and manage relationships are all developmental tasks of adolescence. It is therefore important to recognize that all adolescents may grapple with these developmental needs to some extent as they grow. At the same time, there is also evidence that shows that young people experiencing difficulties associated with adversity, violence and/or traumatic life events might struggle to find a sense of self in relation to the world around them as a result of the trauma response.⁷⁹ Similarly, difficulties with communication and self-expression might be observed in young people who have experienced challenges in brain connectivity as a result of adversity, violence and/or traumatic experience to a greater extent than might be expected of adolescents whose neurobiological connectivity has not been disrupted.⁸⁰ This suggests that a young person whose executive development process has been disrupted by traumatic experiences for example, might exhibit a greater propensity for

reward-seeking (sometimes referred to as 'sensation seeking'), and that this reward might take the form of social approval, including participation in social groupings that may be considered 'problematic' (eg. gangs) but nonetheless elicit a sense of belonging for the adolescent.⁸¹ Evidence also suggests that there may be a link between exposure to adversity, violence and/or traumatic experiences and potentially detrimental use of electronic media resulting in susceptibility to exploitation because of a possible reward motivation.⁸²



Ismail's story

Ismail is an 18 year-old male who has just been referred to an adult detention facility for participating in a robbery. Ismail's dad died three years ago, on the journey across the Mediterranean. About 20 people from their boat died, but Ismail and the others survived and they were taken to a refugee processing center.

He spent fourteen months in detention, waiting to hear what would happen to him next, relying on NGOs for food and having no way to communicate with the outside world. The detention center did not have any schooling or health facilities, although one person in Ismail's dormitory did receive medical attention after attempting to take his own life. Ismail became very withdrawn during this period, and he stopped speaking to people altogether.. He was finally released on a temporary asylum-seeker's permit, but he did not have the right to work and, because he had already passed the age until which education was mandatory (and therefore free), no school would admit him.

With nowhere to go and a sense of hopelessness, Ismail joined a group of other teen asylum-seekers, most of whom worked for small fisheries for daily wages without formal work permits. When there, he befriended a man named Bilal. Ismail began to interact with others socially and even to think about the future, which he hadn't for a long time, although he didn't have enough money to do anything other than eat and sleep. Bilal helped Ismail find a place to stay and they even sometimes called each other 'brother', which was the closest Ismail came to having a family .

When Bilal arrived at the fishery on a motorbike one day, Ismail asked how he could afford it. Ismail told him about the gang he was in, that sometimes robbed the houses of people on the neighbouring island or helped with the movement of drugs between the islands to make extra cash. Bilal invited Ismail to join, but, afraid and hesitant, Ismail refused. For months, Ismail continued to work at the fishery seven days a week until, one day, Bilal told Ismail that he wouldn't be working there anymore. Bilal said he was going to the bigger island, where there was more opportunity and asked Ismail to join him. Ismail agreed. One night, they decided to rob a small cottage on the water's edge. They weren't sure if anyone was home, but decided to risk it because only an old woman was known to live there. Ismail went first, thinking they would take a few things and leave the woman unharmed. He doesn't remember what happened next – just the sound of Bilal's motorbike speeding away and a police car's siren blaring.



Key message:

By nature, adolescents need and seek experience and engage in experimentation because it elicits rewards. Identity formation and personality development are fluid processes and this is an adaptive feature of growth. A disruption may result in overemphasis on emotional responses or under-development of empathy.

Personality development is a lifelong phenomenon, beginning in early childhood and continuing through adolescence and towards adulthood.⁸³ Experimentation and adaptation are key features in all adolescents, with varying degrees of cultural and social expectations that may support or inhibit this process. Motivation and peer responses play a significant role in identity formation as well as personality development, and much of the process of development is considered to be functional and necessary, but research indicates that adverse, violent and/or traumatic experiences may have an unfavourable impact.⁸⁴

Studies illustrate that hyperarousal is associated with impulsive and reactive personality traits.⁸⁵ Similarly, an over-reliance on the emotional centre has been associated with impulsivity and self-harming behaviours,⁸⁶ while the experiences such as neglect have been shown to contribute to ruminative and 'depressive' personality traits.⁸⁷ Research also indicates that there is a relationship between development of what are known as 'callous or unemotional' personality traits in adolescents with an under-responsive emotional centre,⁸⁸ which itself is associated with caregiving deficits such as an absent parent or a parent who is abusive.⁸⁹ In general, caregivers play a significant role in the development and formation of the adolescent's personality, including through modelling and through the ways in which adolescents experience arousal or lack thereof in the relationship.⁹⁰

I was also chubby and when I was a kid they (parents) restricted my food to lose weight or they threw comments at me. I decided to go on a diet at a certain age, but that diet got out of hand, I developed an eating disorder, so it took me many years, many years, like five, to be able to coexist with this... because I have to live every day with those people who said comments to me and...I still feel a little bit of resentment....I think that the comments, the small attitudes especially when one is in the process of growing up, especially affects [someone] too much.

Quote from an adolescent taken from UNICEF. (2021). On My Mind⁶²

Development of a set of values and of traits such as benevolence, empathy and openness to experience are also considered to be associated with the development and functional connectivity of the reasoning centre.⁹¹ While there has been little research on the neuropsychological implications of processes of discrimination and xenophobia in adolescents, research in adults shows that the subjective experience of dehumanization can introduce a stress response, while the experience of 'othering' can reduce aversion to harming outgroup members as well as perceiving those with unshared identities as 'threats'.⁹² This suggests that various regions of the brain are activated both in 'in-group' and 'out-group' identities, evoking emotional responses and potentially subverting any empathetic response to the needs of others.



Key message:

Needing more agency and autonomy is a development task of adolescence, and this requires adapted approaches to interacting with teens through governance mechanisms, education and especially through the caregiving relationship. This relationship is still vital, although the needs of the adolescent will change over time, and it is to be expected that some conflict may occur. Even so, responses from caregivers and from society in general can be a source of disrupted development when adolescence is stigmatized unnecessarily.

The desire for greater autonomy during adolescence is not only appropriate but a necessary developmental milestone. Autonomy includes a variety of different capabilities, which rely on reasoning and decision-making capacities. The individuation process that adolescents undertake might include desire for differentiation from one's family of origin (eg. The refusal to abide by the family's religious prescripts), the desire to distinguish oneself from others (eg. The use of dress, body art or other expressive features) or other behaviours which might be considered 'rebellious'.⁹³ While this sometimes can represent a challenge for governance systems, educators and caregivers, it should also be taken in the context of greater reasoning capacity, coupled with increased critical thinking skills.⁹⁴ There is a greater need for a voice in making decisions during adolescence – to utilize, validate and refine these newly developed skills - which requires that caregivers and perhaps more broadly educators and political decision-makers offer opportunities for young people to engage in dialogue,⁹⁵ participate in decisions affecting them and provide space for the act of distinguishing oneself from others.^v Denial of autonomy or lack of recognition of the need for self-expression may be experienced as a distress response in the adolescent brain, triggering hyperaroused or hypoaroused responses.⁹⁶

I think this happens a lot between the older and younger generations, where older generations won't take the voices of youth as seriously. So that can cause a lot of the younger generations to maybe rebel or...just get frustrated. And that causes a lot of emotions to come up, because oftentimes, we feel like those that were not heard. And that can cause a lot of frustration and confusion.

Quote from an adolescent taken from UNICEF. (2021). On My Mind⁶²

The vast majority of research on brain development and its relationship with caregiving is focused on infancy and early childhood. However, the experiential nature of adolescent development as well as the role that relationships play during this phase of life suggest that the caregiver relationship is especially important. Absence of a caregiver, which itself would be considered adversity, can have a detrimental impact on the feedback mechanism that helps teens to self-regulate and thus emotional regulation may remain underdeveloped as a result.⁹⁷ Adolescent brain activity tends to mirror parent brain activity, especially in emotion-processing regions.⁹⁸ This suggests that caregiver emotions, positive or negative, can be experienced positively or negatively in adolescents too, which may have implications for conflict management and the ability to de-escalate conflict when it occurs. While a degree of conflict between caregivers and adolescents might be expected and is in fact considered adaptive as part of the individuation of

^v It is important to note that neuroscience previously held to be true and now rejected as false has been utilized historically to disenfranchise groups from opportunities for political participation and autonomy. See, for example: <https://www.theatlantic.com/science/archive/2019/07/womens-suffrage-nineteenth-amendment-pseudoscience/593710/>. Similarly, advocates for restrictions on freedoms for adolescents have argued that the maturational imbalance may warrant such limitations based on neuroscientific arguments. See, for example: [Hodgson et al. v Minnesota et al. Supreme Court of the United States 497 US 417 \(1990\)](#). A responsible approach to neuroscience is essential for the purposes of doing no harm to children and adolescents.

the adolescent, the adolescent's response to their caregiver's emotions may impact how conflict is experienced and managed, including outside of this specific relationship.⁹⁹

In situations where interpersonal difficulties have arisen because of neglect or abusive parenting, the adolescent may develop 'callous, unemotional' traits, or may develop a hyperaroused response which impacts their ability to regulate their own emotions and thus contributes to conflict escalation. Navigation of boundaries between adolescents and their caregivers or educators is a complex process even where there are no disruptions, but this may be especially challenging when an adolescent's distress response is triggered by the conflict inherent in that process or when the relationship itself evokes hyperarousal because it has historically been associated with the adolescent's stress response.¹⁰⁰

...If there is a misunderstanding with parents at home and they have yelled at him, the boy becomes depressed and thinks of committing suicide just to vanish out of the world.

Quote from an adolescent taken from UNICEF. (2021). On My Mind⁶²

Studies among adolescents have also shown that praise and criticism coming from caregivers and educators have neurological implications for adolescents. Negative feedback from caregivers and other adults activates a stress response, while praise is associated with activation of positive mood centres, improved social cognition and affective memory. This may thus serve the role of reinforcing praised behaviours.¹⁰¹

3.5.

Adolescent curiosity and need for stimulation



Key message:

It is not problematic for teens to be curious and to experience a lack of stimulation as challenging – these needs are a product of the natural course of development because the brain is developing rapidly and thus extremely responsive to stimuli. Absence of stimulation is one potential challenge to development.

As mentioned above, adolescent risk-taking is a key feature of the developmental process. While this may present as a so-called 'problem' behaviour to some, neuroscience would suggest that it is adaptive as adolescents are, by virtue of their developmental state, prone to curiosity and the pursuit of novelty (which may include experimentation with risk behaviours).¹⁰² The risk-taking behaviour is thus associated with this growth as well as the maturational imbalance, while it also signifies a reward motivation. Importantly, the need for curiosity to be satisfied supports developmental tasks such as identity formation and value clarification, meaning that boredom should be avoided through efforts to stimulate adolescents in ways that are meaningful and supportive of their development.¹⁰³

Boredom is considered to be a source of sensory deprivation.¹⁰⁴ Research shows that a lack of stimulation triggers a stress response, which can be particularly powerful in adolescents because of the role that the reward system plays in motivating young people to avoid distressing situations.¹⁰⁵ This is why adolescents are particularly in need of stimulation, which can take the form of intellectual stimulation in education settings; problem solving stimulation in the form of sports or other activities; or in some cases, can also trigger more challenging behaviours to address the reward motivation.¹⁰⁶ In the absence of alternatives, efforts to address depressive ruminations or boredom might include high-risk behaviours that reduce the stress of the

experience of deprivation.¹⁰⁷ In short, bored adolescents may take more risks to satisfy their needs, or their boredom may begin to affect their long-term mental health.

Since the pandemic started...we all have spent that entire duration at home. Meanwhile, I am the kind of person that absorbs energy from meeting people...So as you can imagine, all of a sudden, I cannot see my friends, nor other people at all. I never socialize. Therefore, it stresses me out.

Quote from an adolescent taken from UNICEF. (2021). On My Mind⁶²

3.6. Adolescent need and capacity to learn



Key message:

Teens need to learn as their capacity to learn grows. At the same time, the ability to learn and retain information is highly dependent on the brain's capacity to learn, which, in turn, is affected by environmental factors. The learning and retention of various types of information also informs behavioural outcomes.

Education is one of the correlates of wellbeing across the life course, in part because schools are important settings for social and emotional development, and learning in the adolescent years is of vital importance for future outcomes, while also being a universal right of children in terms of the CRC.¹⁰⁸ Perhaps more pointedly, research indicates that some connections in the brain may atrophy if their capacity to learn is not attended to.¹⁰⁹ It is therefore vital that education is seen as a developmental need.

Centres of the brain implicated in memory retrieval and storage as well as mental flexibility are crucial in the adolescent phase. Working memory, which is recruited as part of the individual's process of complex reasoning, develops over time in adolescents and leads to more complex tasks being undertaken.¹¹⁰ However, where the brain is occupied with survival or affected by adverse, violent and/or traumatic experiences, there are potential negative implications for the development of working memory, which will then likely impact critical thinking, problem-solving and possibly interpersonal relationships in later life.¹¹¹

More 'simple' forms of memory (eg. Familiarity) develop in childhood, but research indicates that the adolescent brain's relationship with memory storage and retrieval is complex on the path towards adulthood. In adults, research indicates that areas that support learning of new information are less developed when self-reported experiences of maltreatment during childhood and adolescence occur,¹¹² suggesting that maltreatment affects functionality of key learning centres and likely produces negative learning outcomes.

Adolescent memory development is also particularly closely linked to the functions of emotional centres, including the storage of emotionally stressful experiences and of enjoyable experiences.¹¹³ As a result, adolescents may experience intensity of emotions associated with specific stimuli because of the ways that memories are stored and retrieved. Research also points to 'recollection-based judgments' as a key part of the adolescent's brain development, suggesting that those experiences which have proven to be rewarding may influence future decisions or behaviours, while those experiences that have been challenging might also contribute to future choices.¹¹⁴

I think people my age would feel sad having to spend a chunk of their lives inside [their home].

Quote from an adolescent taken from UNICEF. (2021). On My Mind⁶²

Trauma has been shown to significantly alter memory retrieval and storage, particularly autobiographical memory and episodic memory.¹¹⁵ In particular, 'reliving' of traumatic events is often reported.¹¹⁶ There is also evidence that hyperarousal has a negative impact on broader executive functioning, potentially inhibiting an adolescent's ability to learn and retain complex information. Research in younger children also indicates that prolonged release of cortisol (which regulates the stress response) can alter the ability to learn new information and to retain it, thus affecting academic outcomes. These earlier life impediments would have an impact on adolescents' ability to learn and retain information even as they grow.¹¹⁷



Sean's story

Sean is 22 years old and works as a clerk at the Town Hall. During his childhood, his parents fought on an almost daily basis, at times violently, and his father had a gambling addiction. Sean witnessed conflict from a young age and had difficulties with bedwetting and nightmares as a child.

His teacher in primary school suggested that Sean be placed in a gifted program as he showed 'enhanced aptitude'. His parents agreed, and Sean found that he especially enjoyed art and design, but he only remained in the gifted program for one year because his parents had to move on account of the loss of their home.

Sean's nightmares and bedwetting resolved at the onset of puberty, but as an adolescent, he found it difficult to make friends and he attempted suicide at the age of 14 because he experienced teasing about his physique and his quietness. After his attempt, he was removed from his parents' home and placed in foster care on the advice of a child protection officer.

He was later diagnosed with an autism spectrum disorder and major depressive disorder by a child psychiatrist and prescribed medication. Instead of the academic route at school which was over-subscribed, Sean was placed on a vocational training route, to develop basic clerical skills or other skills that would allow him to work in 'sheltered' settings on account of his disability. He lives by himself and has had one girlfriend, who broke up with him after three months on account of what she termed his 'lack of ambition'.



Key message:

Sexual development is a key component of adolescent development, and it is part of the reason why adolescents can display erratic emotions, impulsivity and risk-taking behaviours as part of their growth process. However, adversity, violence and/or traumatic experiences can contribute to difficulties, including heightened propensity for sexual risk-taking and adolescents who have experienced abuse becoming perpetrators of sexual violence themselves.

One of the most prominent changes that occurs during adolescence is sexual development. This includes anatomical changes as well as the development of patterns of attraction in adolescents.¹¹⁸ Secretion of so-called 'sex hormones' such as testosterone, progesterone and estrogen is at its highest during adolescence and this can have an impact on the brain (along with secretion of stress hormones and growth hormones), contributing to erratic moods as part of the natural course of puberty.¹¹⁹

Behaviourally, initiation of sexual activity is not uncommon in adolescents, although the term 'early sexual initiation' is used to refer to sex before the age of 15, which carries with it greater risks for sexually transmitted infections (STIs) and adolescent pregnancy.¹²⁰, while interest in sexual and romantic relationships can be particularly high. The combination of physiological and sexual development can be psychologically challenging for any adolescent, although particular stressors include adolescents who experience attraction to people of the same sex (who may experience discrimination)¹²¹ or when strict caregiver control results in suppression of sexual expression.¹²²

It is important to note that sexual interest and behaviour can also be affected by adversity, violent and/or traumatic events and that experience of sexual assault during childhood and adolescence is a significant stressor.¹²³ Outcomes include potentially suppressed sexual appetite¹²⁴ (although the lack of sexual desire – or asexuality – is not inherently problematic or a sign of exposure to adversity, violence or traumatic experience);¹²⁵ and engagement in risk-taking sexual behaviour which may result in STIs or adolescent pregnancy, which bring with them additional psychosocial difficulties.¹²⁶

Adolescents are killing themselves some because of failed relationships, some because of being impregnated, and some for contracting diseases, so they fear being the talk of the village and it is shameful.

Quote from an adolescent taken from UNICEF. (2021). On My Mind⁶²

Factors such as impulsivity and curiosity (as explored above) play a significant part in adolescent sexual behaviour. These are not inherently 'problematic' but difficulties with self-regulation and decision-making – many of which correlate with adversity, violence and/or traumatic experiences – can contribute to behaviours which are challenging for the adolescent or those with whom the adolescent interacts. For example, research from the United States (US) indicates that one third of all sexual assaults committed against children are perpetrated by adolescents, with adolescent males accounting for 90% of all sexual offenses perpetrated by this age group in the US.¹²⁷ Studies vary on the proportion of adolescents perpetrating sexual violence who have themselves been subjected to similar violence, but these estimates are 'almost always' higher than the general

population.¹²⁸ This illustrates the complex and potentially reinforcing relationship between adversity, violence and/or traumatic experience and its behavioural correlates, while also illustrating why empathetic and restorative supports are needed.



Thato's story

Thato is a 17-year old girl who was subjected to sexual abuse from the age of three. She experienced regular and repeated assaults, including rape, until age 10. Her family support system was limited as she is one of eight children and she lives with her grandparents as both her parents died of AIDS. Thato was considered a disruptive student throughout her time in primary and then secondary school. Several teachers either sought to exclude her from school or to hold her back because she was considered to be 'intellectually incapable'. Thato did not disclose the abuse she suffered, and she did not have any psychosocial support, instead using cigarettes from the age of 10, followed by marijuana at the age of 12, and then alcohol and opiates by age 15. She was 'easily triggered' according to the one friend she had, getting into fights regularly and becoming angry without her peers understanding why. She had several boyfriends, and, according to her friend, engaged in self-harm if she perceived any rejection by these boyfriends. Many people in the community considered her to be 'sexually promiscuous' even though she engaged in sexual activity to retain the affections of her boyfriends. At age 16, Thato contracted HIV from a sexual partner. Her Voluntary Testing and Counselling (VCT) session was the first psychosocial support she received. It was short as the clinic was severely understaffed, and she was referred to a mental health provider for an evaluation. The assessor noted that she was 'impulsive' and displayed 'borderline personality traits', referring her to a remedial institution where she was repeatedly told she was 'slow'.

4. Pathways to resilience: Understanding multifinality and equifinality and factors promoting or inhibiting adolescent opportunities to thrive

Recognizing the impacts of multifinality (ie. The possibility of one event to result in multiple outcomes) and equifinality (ie. The possibility of one result arising from a variety of possible antecedent events), interest has grown in efforts to improve life-course outcomes by examining the impacts of various promotive and inhibitory factors on developmental outcomes. The adolescent brain has demonstrated capacity to 'rewire' itself, to develop connections that had otherwise not been developed and to pursue 'network balance' when there are appropriate supports in place for doing so.¹²⁹ Capacities for language, memory, executive functioning and emotional regulation can thus all be altered throughout the duration of adolescence provided that impediments to 'healthy' development are mitigated and supports strengthened. What follows is a broad overview of these factors.

4.1.

Supporting the adolescent capacity to thrive: A socioecological perspective

Various factors can contribute to the experiences of an adolescent and to their subsequent behaviours. A number of these are environmental or systemic in nature, while recognizing that various interpersonal and individual factors will play a role in development too. A systems lens that recognizes micro-level as well as macro-level contributors to adolescent development is going to be essential to understand what factors contribute to thriving, and what factors might promote or inhibit it. In particular, it is important to use a socioecological lens¹³⁰ for the purposes of understanding how an individual's wellbeing is affected by the world around them and particularly by adverse, violent and/or traumatic events.

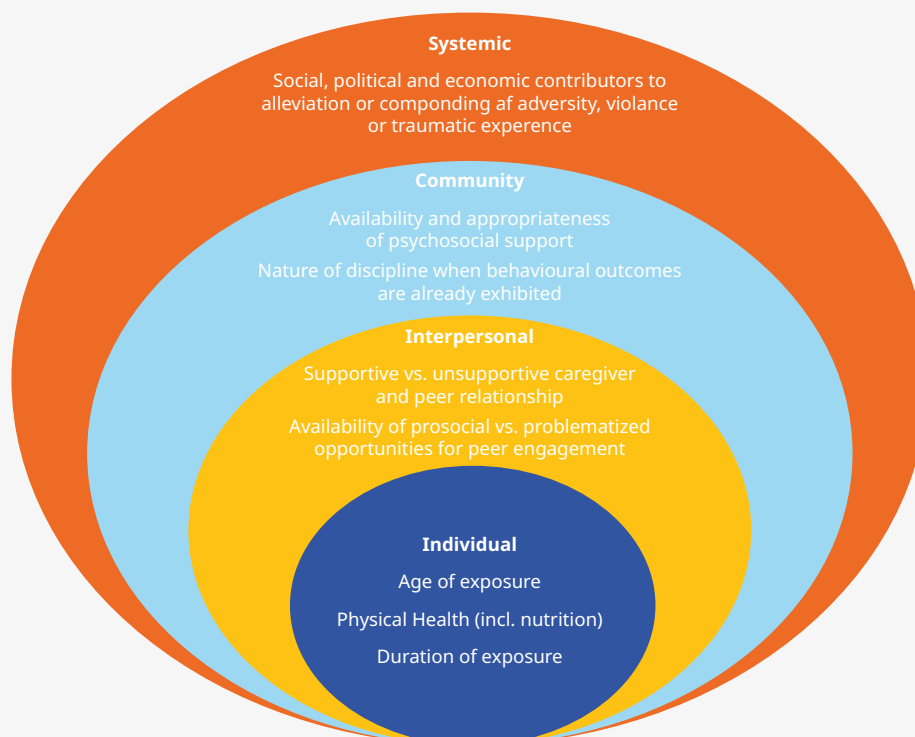


Figure 2: Socioecological approach to adolescent development and the impact of adverse, violent and/or traumatic experiences

4.1.1. Individual level factors promoting or inhibiting opportunities to thrive

i. Age

The age at which a child or adolescent is exposed to adversity, violence and/or traumatic experience can have a significant impact on outcomes. In short, the younger the child is at the onset of an adverse, violent and/or traumatic experience, the more likely it is that there will be some neuropsychological 'imprint' of the experience, and likely a behavioural component as well.¹³¹ Age is intrinsically linked to the stage of the 'wiring' of the brain, and disruptions earlier significantly impact development.¹³² Conversely, older onset is associated with a more 'stable' neuropsychological picture, which would not be in place otherwise.¹³³ Therefore, older age suggests less likelihood of 'problematic' outcomes. Learning is also especially likely to be affected earlier, and this can then impact the adolescent's ability to incorporate and retain new information because of disruptions in the learning process.¹³⁴ Research indicates that age is also correlated with onset of mental health challenges, with some mental health conditions such as anxiety or obsessive compulsive behaviours peaking at a younger age compared to affective and personality-related conditions, likely because of the more complex associations between neural networks that contribute to these conditions.¹³⁵

ii. Duration and intensity of exposure to adversity, violence and/or traumatic experiences

The duration of exposure to adverse, violent and/or traumatic experience is a considerable source of hyperarousal or indeed hypoactive emotional responses depending on the individual.¹³⁶ Adolescents whose exposure to such stimuli is limited in duration display fewer neuropsychological correlates than those who experience prolonged exposure.¹³⁷ It should, however, be noted that duration and intensity are difficult to untangle from one another, and that both of these factors are considered part of 'toxic stress'.¹³⁸ Intensity of exposure is itself characterized by the intolerability, uncontrollability, or overwhelming nature of a stressor, which may be person-specific and thus contribute to person-specific outcomes.¹³⁹ In addition, it should also be noted that exposure to 'toxic stress' itself can be ameliorated through the presence of supports such as psychosocial counselling or stability of relationships that mitigate prolonged exposure to instability.¹⁴⁰

iii. Disabilities

Disability may be an antecedent or an outcome of an adverse, violent and/or traumatic experience, suggesting that a bidirectional lens should be applied.¹⁴¹ Nonetheless, disabilities can have an impact on an individual's development, potentially inhibiting the adolescent capacity to thrive over the life course. However, lack of supports that are appropriate and promotive of growth and development is a significant concern.¹⁴² Evidence also suggests that adolescents on the autism spectrum are likely at greater risk than others for social exclusion and withdrawal as well as difficulties with social interaction – this can result in behavioural challenges including withdrawal and over-use of cyberspace and gaming.¹⁴³

iv. Substance use

While it may itself be an outcome of adverse, violent and/or traumatic experience, substance use is also a potential factor impacting development in individual adolescents because it can disrupt neurocircuitry and formation of connections that are necessary for executive functioning including decision making capacity and the risk/reward pathway. The use of substances at an early age (or in the mother during pregnancy)¹⁴⁴ shows a significant relationship with poor neural development and plasticity. More research is needed to examine the implications of particular substances of use, combinations of substances and the duration of use, but it is clear that substantial alterations in brain development, connectivity and psychological outcomes occur in adolescents who use regulated as well as unregulated substances.¹⁴⁵ Importantly, however, research indicates that a number of the developmental correlates of substance use in adolescents might be reversible with cessation of use, and this is an important consideration for service providers and policy-makers alike.¹⁴⁶

v. Physical health

There is increasing evidence of the relationship between physical health states and adolescent development. In adults, for example, at least 50% of Human Immuno-deficiency virus (HIV) positive patients exhibit a neurocognitive impairment,¹⁴⁷ affecting ability for self-care, ability to adhere to medication regimens and potentially also having an impact on reasoning abilities that might then give rise to further risk-taking.¹⁴⁸ However, close to one third of HIV infections are in adolescents and young adults,¹⁴⁹ and the impacts of the virus on development have been less well-studied in this group. While it is clear that more research is needed, the data that do exist for this age group indicate that there may be cognitive implications such as executive level functioning impairments as well as interruptions in the process that is necessary for connectivity to develop.¹⁵⁰ This could then have an associated impact on complex reasoning, on emotional regulation, on risk and reward behaviours and other potential outcomes. At the same time, the interruptions mentioned do, in fact, seem to be less severe and more reversible among adolescents than in adults with treatment, suggesting that degree of plasticity may be a predictive determinant of improved outcomes.¹⁵¹

Likewise, associations have been noted between developmental outcomes and physical health outcomes including cancer,¹⁵² diabetes,¹⁵³ asthma¹⁵⁴ and others,¹⁵⁵ but there is less clarity on the causal mechanisms given that most evidence focuses on early-life developmental disruptions rather than the experiences of adolescents who have lived through adversity, violence and/or traumatic experiences. Moreover, this factor is made even more complex by potential treatments which might induce neurodevelopmental responses (such as cranial radiation).¹⁵⁶ Nutrition is also an individual-level factor that can promote or inhibit adolescents' opportunities to thrive, because functional and structural connectivity¹⁵⁷ are negatively affected by malnutrition, although this is clearly a social and economic concern as well as an individual one. Poor nutrition can influence cognitive learning capacities, impacting working memory and skills acquisition.¹⁵⁸ Importantly, there is evidence to suggest that interventions aimed at improving nutritional quality for children and adolescents (meaning intake as well as nutritional value) can contribute significantly to improvements in working memory,¹⁵⁹ attention¹⁶⁰ and executive functioning.¹⁶¹ Obesity among adolescents, also a policy concern as well as individual-level characteristic, has been shown to have an impact on working memory and complex reasoning,¹⁶² and this may represent an area where increased attention is needed. Other studies have shown that adversity, violence and/or traumatic experiences may pre-dispose children and adolescents to obesity¹⁶³ and that the link between PTSD and obesity is a complex and potentially bidirectional one.¹⁶⁴

4.1.2 Interpersonal factors that promote or inhibit adolescent opportunities to thrive

i. Caregiver relationship and caregiver wellbeing

Studies illustrate that caregiver attachment and responsiveness have an impact on early life emotional processes but also on adolescents' development of executive level functioning associated with processes such as empathy which invoke both reasoning and emotion.¹⁶⁵ Supports for caregivers to develop more responsive parenting approaches can thus have an impact on the life course and behavioural outcomes of adolescents. These include programs aimed at reducing conflict, managing communication and preventing violence.¹⁶⁶ Studies also illustrate that the wellbeing of caregivers can have a significant impact on the wellbeing of their adolescent children, and this should be taken into account in programming and policymaking.¹⁶⁷

ii. Educator and school relationship

A significant amount of adolescents' time is spent with their educators, meaning that there is a considerable association between adolescent sense of wellbeing, belonging and connectedness and their relationship with their educator.¹⁶⁸ Teachers who are aggressive or use punitive discipline can actually negatively impact the development of students, while

teachers who are empathetic and able to differentiate teaching styles based on the needs of individual students can substantially affect their development by reducing hyper-arousal responses.¹⁶⁹ Studies also indicate that, because of natural changes that impact sleep patterns of adolescents, later start times for school can also be supportive of development.¹⁷⁰

iii. Peer relationships

Peer violence, whether in schools, communities or online can be a significant source of trauma for adolescents and thus potentially inhibit the opportunity to thrive.¹⁷¹ By contrast, prosocial interaction with peers can be supportive of development as compared to adolescents who experience reward through interactions that are transgressive in nature or those whose experience of reward is mediated by belonging to a group that participates in behaviours that are in conflict with the norms of society (e.g. gangs).¹⁷² Similarly, adolescents who experience strong and supportive connections with peers are less likely to face self-evaluative challenges and more likely to experience rewards associated with positive mood states.¹⁷³ The absence of such relationships is therefore considered a factor that inhibits adolescents' opportunities to thrive and may give rise to so-called 'problem behaviours' while its presence might be said to be a likely factor for promoting the adolescent's opportunity to thrive. Offering alternative group formations where adolescents experience the reward of peer approval without the risk of engaging in stigmatized or so-called 'problem' behaviour may support adolescent development.¹⁷⁴

4.1.3. Community and system-level factors that promote or inhibit the adolescent capacity to thrive

i. Approaches to rehabilitation, recovery and restoration

A factor that is of especial importance in the context of this paper is the way in which support is provided to adolescents who have experienced adversity, violence and/or traumatic events. Considering whether such support is developmentally appropriate and trauma-informed or whether it is neuropsychologically unsound or compounds the experience of adversity, violence and/or trauma is critical. Neuro-imaging studies, for example, have illustrated that punitive treatment, exacerbates the experience of adversity, including overactivation of emotion-focused regions that correlate with trauma.¹⁷⁵ This is especially true of interventions that undermine the developmental tasks of adolescents outlined above (eg. meaningful relationships, identity formation and individuation, agency and autonomy, learning opportunities, need for stimulation) such as deprivation of liberty. In other words, the punishment in itself is traumatic and worsens outcomes because it is not supportive of the adolescent capacity to thrive. Of particular importance is the fact that punitive approaches are utilized disproportionately among sub-populations, such as minoritized adolescents or those in poor communities, actually exacerbating inequalities rather than alleviating them.¹⁷⁶

The same is true of punitive approaches to behaviour management in homes and schools, with studies suggesting that approaches through which young people are offered knowledge and reasoned with rather than segregated and punished can contribute to developmental gains, while there is evidence of disruption in the risk/reward system of behavioural governance when overly punitive or segregation-based approaches are utilized.¹⁷⁷ Likewise, the developmental process and the learning and retention styles of adolescents can be a contributing factor to how well or how poorly they receive particular sources of support. An example is a variation of Cognitive-Behavioral Therapy (CBT) for trauma which relies on systematic exposure to a trauma-inducing stimulus and 'extinction' of the trauma response through controlled exposure. However, the exposure and 'extinction' approach has been shown in some studies to rely on maturation of the prefrontal cortex that hasn't yet fully occurred, causing some researchers to suggest that therapies need to be adapted to 'bypass'

this mechanism altogether¹⁷⁸ or to utilize an approach that ‘titrates’ exposure and instead focus heavily on coping skills as the alternative delivery strategy that is more appropriate to developmental phasing.¹⁷⁹

ii. Socioeconomic factors

Compounded trauma is also related to contextual factors such as socioeconomic circumstances, with research showing that the absence of resources among poor households is experienced as neuropsychological distress and can thus inhibit further growth,¹⁸⁰ while the same is true of prolonged exposure to social and ecological stressors such as discrimination, climate change or possibly even political upheaval.¹⁸¹ Research indicates that hyperarousal responses last longer and thus pose a continuous challenge to adaptability in the face of social stressors, while the social stressors themselves may also be a function of unequal distribution of social resources which promote the wellbeing of some but expose others to adverse, violent and/or traumatic experiences.¹⁸² This is why a socioecological lens can be helpful in understanding the multifaceted and often mutually reinforcing role that various stressors play in activating specific structures of the brain and potentially inhibiting the connectivity or structural formation of others.

4.1.4. Poly-victimization and/or cumulative exposure

It is important to note that many adolescents experience more than one form of adversity, violence and/or trauma in their lives. As noted above, research indicates that the ‘simultaneous’ occurrence of multiple forms of adverse, violent and/or traumatic experience is particularly challenging and this too can be experienced more detrimentally depending on how young a child is when they experience these events.¹⁸³ These experiences would not be confined to one ‘realm’, but rather may be inter-related individual, interpersonal, community and political effects. Research indicates that adolescents from sub-populations in which socio-economic hardship is experienced can be particularly vulnerable to interpersonal violence,¹⁸⁴ for example, and this transcends the ‘layers’ of the socioecological approach, recognizing that an adolescent-centered and contextually grounded approach must be taken into account at all times and that the various ecologies in which an adolescent may find themselves may interact with each other to contribute to multitudinous adverse, violent and/or traumatic experiences.

5. Conclusion

A few limitations should be considered in relation to the findings that have been presented above. References to psychiatric conditions should not be considered as diagnostic but rather in a colloquial sense to describe certain behaviours observed in adolescents across contexts.^{vi} It should also be noted that the vast majority of studies related to neuropsychology focus on neuro-imaging as a source of evidence. This type of evidence is cross-sectional and correlational in nature, offering insight into the mechanisms at play in the adolescent brain but making it difficult to draw causal conclusions.¹⁸⁵ Similarly, most research on the adolescent brain has been conducted in North America, Europe and Australasia, which renders a somewhat under-representative picture of developmental processes. This, however, does not necessarily indicate that the brains of other adolescents would vary significantly, but it should be noted that more research is needed from 'Global South' contexts given the need for culturally relevant approaches to restoration and support.¹⁸⁶

The aim of this paper was to apply findings from neuropsychology in the context of adolescent brain development to inform the rethinking (in a separate paper) of services adapted to adolescents in general, with a focus on support and response systems for adolescents who engage in behaviours that are deemed problematic, especially those who have experienced adverse, violent and/or traumatic life events. In particular, the paper aimed to demonstrate that the stigmatization of behaviours that are a natural part of the growth and development of adolescents should be reconsidered. As part of the natural course of development, adolescents may show a propensity to take risks to obtain rewards, to experience challenges related to self-regulation, critical thinking and decision-making. Likewise, the natural course of development lends itself to complex navigation of social relationships which may include peer pressure, desire for inclusion and friendship formation and sensitivity to exclusion. By nature, adolescence is a time when curiosity and the need for experimentation and the value of experience is heightened, and this can include expressions that adults may find 'problematic' or 'rebellious' but are nonetheless part of the process of individuation. Understandably, conflicts with caregivers and educators may arise, but it is important to recognize that as adolescents mature, their desire to be participants in decisions affecting their lives will also evolve and that behavioural management and respect for rules does not necessarily need to be imposed in an authoritarian manner but rather through a process that accounts for the developmental stage of the adolescent brain (and is thus interactive and dialogue-based). Similarly, all adolescents display a need for stimulation and a need to learn (along with a growing capacity to learn). It is part of the developmental process to struggle when an adolescent feels bored or unstimulated. Many behaviours that are labelled as 'problematic' and seen as challenging by adults are, in fact, developmentally appropriate for the phase of life adolescents are in, and this requires that an adolescent-centred approach to development is adopted, in which all aspects of the adolescent's life and behaviour are taken into account to form a holistic picture of their development and their identity and personality, which will naturally and appropriately evolve over time.

vi The ICD-11 does not specify childhood mental health conditions. Instead, and in recognition of the lifespan nature of many psychiatric conditions, those that present in children and young people are included with all others, and these apply across all ages, which presents a challenge as child and adolescent presentations may vary considerably from adult presentations. To assist interpretation there are additional clauses relevant to childhood presentations in the ICD-11, and these should always be read with any presentations for a fuller picture in the event of a need for a diagnosis.

Notwithstanding the developmentally appropriate nature of many adolescent behaviours, when adolescents experience adversity, violence or traumatic events, development may be disrupted, imbalances may occur and challenges may arise. The behavioural correlates of adversity, violence and/or trauma can be difficult for systems to deal with, at times because they present as 'problems' that require segregation from society rather than rehabilitation with a trauma-informed lens that recognizes the inherent potential that neuroplasticity represents. The evidence presented above illustrates that justice, education, welfare and health sectors can and should reconsider how they engage with adolescents displaying behaviours labelled as 'problems' and should take into account the individual's experience of adversity, violence and/or traumatic life events which may have given rise to such behaviours.

As has been explored in this paper, adolescents are particularly adept at recovering from difficult experiences when the appropriate supports are in place to foster resilience. What is especially important is that the social and sectoral responses to adolescent expressions of distress, hyperarousal or hypoarousal do not reify the challenges that adolescents have already faced but, rather, cultivate restoration and recovery. Policy levers for addressing these needs are ultimately needed and will be explored in a complementary paper which places an emphasis on a socioecological lens that does not stigmatize adolescent expressions of developmental need but rather recognizes the inherent capacities they possess and harnesses them for more fruitful outcomes.

Annex 1

Adolescent brain development milestones, the potential impact of adversity, violence and/or traumatic events and behavioural correlates

Trajectory of development	Reasoning, decision-making and emotional regulation	Importance of peer relationships	Personality and identity formation	Importance of autonomy and implications for relationships with caregivers, educators and governance systems	Need for stimulation	Need and capacity to learn	Psychosexual development
'Typical' development	<ul style="list-style-type: none"> Development of reasoning centre progressively maturing to pre-adult functioning Increased self-regulation over time Some risk taking is expected and adaptive (eg. Engagement in sports requires some risk taking) 	<ul style="list-style-type: none"> Emphasis on peer relationships is strong Some challenges might be experienced in self-expression, self-esteem and the need for peer approval, but these are expected to diminish 	<ul style="list-style-type: none"> Personality formation is a continuous development-al process Identity formation is especially relevant because of the role that social cognition plays in young people's lives 	<ul style="list-style-type: none"> Greater reasoning and critical thinking skills contribute to more questioning of norms and desire for autonomy, which is a signifier of growing maturity 	<ul style="list-style-type: none"> There is a heightened cognitive need for stimulation during this phase, and stimulation supports the adolescent to develop, to perform the tasks of learning, forming opinions and values and growing towards adulthood 	<ul style="list-style-type: none"> Opportunities to learn are crucial for brain development As the adolescent grows, expectation is that there is greater capacity to engage in critical thinking tasks and more complex learning 	<ul style="list-style-type: none"> Sexual expression and interest in sexual activity may increase as part of the developmental process. However, variations in the nature and extent of these expressions may also occur

- Reliance on the emotion-focused regions forms part of the 'maturational imbalance'

- Interpersonal skills are still developing, so conflicts and other interpersonal challenges may occur
- Developmentally appropriate emphasis on self-evaluation through peer relationships as well as learning through social processes
- Because of the reward motivation of positive peer evaluations, these become part of the adolescent's affective

- Peer evaluations and self-evaluations are also strongly linked at this time
- Personality and identity formation do not end in adolescence, continuing throughout young adulthood

- Part of the growth process includes the need and desire for self-expression and the desire for adolescents to participate in decisions that affect them
- The relationship with caregivers is still of vital importance, but there is a shift towards individuation of the adolescent as part of the 'renegotiation' of the relationship
- Boundary misalignment and demands for independence may result in conflict at times, although conflict is not inherently problematic if managed appropriately

- Development also continues during adolescence, which results in greater volume in areas implicated in learning
- Emotions play a role in the learning processes of adolescents - this means that there is a natural proclivity to be drawn to subjects and experiences that are associated with positive emotions and positive feedback

- Sexual development co-occurs with psychological and social development, including curiosity and desire to engage with peer groups
- This can result in experimentation and learning through experience
- Sexual development can have an impact on behaviour and affect (eg. Erratic mood) because of the impact of 'sex hormones'.

Correlates of adversity, violence and/or traumatic events

<ul style="list-style-type: none"> • Disruption in self-regulation, critical thinking and executive functioning • Ability to self-regulate is inhibited because the risk/reward behaviour becomes 'standard' and critical thinking is underdeveloped • Hyperarousal is a key feature of the stress response to difficult events, although hypoarousal has also been noted 	<ul style="list-style-type: none"> • The association between peer relationships and affect can contribute to negative self-evaluations in disproportionate or overwhelming ways • Stress can disrupt patterns of self-evaluation, self-expression and interpersonal communication, with hypersensitive responses to peer evaluations a possible outcome • Learning through social processes may be inhibited or modulated by the role of emotion • Exclusion by peers is experienced as a source of distress 	<ul style="list-style-type: none"> • Hypoactive emotional response to adversity, violence and/or traumatic experience in some cases, particularly when stress has been prolonged • Anxiety and hyperarousal in other instances, leading to negative affectivity and 'borderline' personality features. • Prolonged exposure to stress of being socially excluded (ie. part of an 'out-group') can also evoke ruminations that are a feature of depressive response 	<ul style="list-style-type: none"> • Denial of autonomy or lack of recognition of the need for self-expression may be experienced as a distress response in the adolescent brain • Adverse experiences include preponderance of conflict, abuse or neglect in the caregiver relationship. These may result in difficulties with emotion regulation in the adolescent as well as impulsivity and efforts to address real or perceived deprivation 	<ul style="list-style-type: none"> • Boredom is experienced as deprivation and causes rumination. This in turn activates a stress response 	<ul style="list-style-type: none"> • Absence of opportunities to learn may lead to life course disruptions • Absence of learning opportunities can constitute deprivation, triggering a distress response • Disrupted development of working memory is likely to inhibit capacities for learning and for critical thinking, which may impact decision-making 	<ul style="list-style-type: none"> • Decision-making remains impulsive and centered on 'risk-taking' and 'reward seeking' • Adolescents may struggle with emotional regulation and may find sexual development a challenge, particularly where social norms inhibit sexual expression • While curiosity and experimentation are natural, where reasoning is underdeveloped, there may be difficulty in regulating behaviours driven by curiosity
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			<ul style="list-style-type: none"> • 'In-groups' may perceive 'out-groups' as a threat, thus activating the stress response and 'bypassing' the empathetic process 	<ul style="list-style-type: none"> • There is potential for interference with development of self-other reasoning and judgment processes such as empathy when it has not been experienced by the adolescent themselves 		<ul style="list-style-type: none"> • Prolonged exposure to traumatic stimuli or prolonged rumination may divert resources away from brain centres necessary for learning to occur • Where subject matter is associated with a hyperarousal response because of 'recollection-based' emotions, learning may be inhibited 	
<p>Possible behavioural and/or psychological outcomes (NB. These are neither universal nor permanent)</p>	<ul style="list-style-type: none"> • Behaviour is considered 'erratic' and – to a degree that is not adaptive - lacks critical analysis of potential outcomes 	<ul style="list-style-type: none"> • There is a higher likelihood of efforts to address the stress response associated with negative peer evaluations or to access the reward associated with positive peer evaluations, which may include risk taking 	<ul style="list-style-type: none"> • Underaffected responses to stimuli, including 'callous/unemotional' traits may be demonstrated, along with behaviours that transgress social norms 	<ul style="list-style-type: none"> • Affective correlates include decreased emotional self-regulation and hyper-arousal 	<ul style="list-style-type: none"> • May contribute to depressive ruminations, resulting in efforts to alleviate the distress response, including risk-taking or 'thrill-seeking' behaviours that are unregulated because of 'suboptimal' connectivity 	<ul style="list-style-type: none"> • Hyperaroused or ruminative responses inhibiting learning may be observed 	<ul style="list-style-type: none"> • There may be greater propensity for risk-taking, and thus engaging in sex earlier or in ways that are risky (eg. Unprotected sex)

<ul style="list-style-type: none"> • The individual can become over-reliant on emotional prompts to determine behaviour without sufficient emotional regulation, possibly resulting in 'problem' behaviours • Impulsive behaviour focused on immediate reward-seeking or immediate aversion to negative outcomes • Behaviours include efforts to relieve stress or achieve pleasure that may constitute 'thrill-seeking' or 'risk-taking' (eg. Substance use) 	<ul style="list-style-type: none"> • Risky behaviours might arise as a result of the reward associated with positive peer evaluations of such behaviours (including through 'in-group' motivation such as seeking membership of a group or seeking friendships online) • Proneness to aggressive behaviours or conflictual communication styles may form part of the behavioural dysregulatory pattern 	<ul style="list-style-type: none"> • Social withdrawal may be a feature of hypoarousal • Significant difficulty with interpersonal and social relations, whether over or under-invested, may become a personality feature • Stress responses may be exhibited as a result of exclusion, discrimination or xenophobia • Lack of aversion to mistreatment of 'out group' members may form part of the experience of a 'bypassed' empathetic process, contributing to willingness to engage in 'othering' and associated violations of the rights of others 	<ul style="list-style-type: none"> • Behavioural correlates might include 'rebellious behaviours' that are problematized or disengagement from human relationships • Conflict proneness may be a behavioural outcome, while lack of empathy may be observed in extreme cases • Overidentification with others and significant need for approval/enmeshment might be behavioural correlates of personality formation 		<ul style="list-style-type: none"> • Efforts to address the distress response may result in behaviours that rely on emotion-focused decision-making or risk-taking, while distributing resources away from efforts to learn • Learning may become a source of distress itself, resulting in efforts to avoid the learning environment or risk-taking to address the distress associated with the learning process 	<ul style="list-style-type: none"> • Gendered impacts can be quite different, with girls more vulnerable to assault than boys (but this does not mean boys are immune from sexual assault) and boys more likely to perpetrate sexual assault than girls (but this does not mean girls are not capable of being perpetrators)
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	<ul style="list-style-type: none"> • Self-harming behaviours to alleviate excessive distress may be part of the behavioural makeup 						
<p>Implications for programming to support the adolescent capacity to thrive</p>	<ul style="list-style-type: none"> • Programming should consist of efforts to support young people to focus on critical thinking, reduce the hyperarousal response through removal or reduction of negative stimulus 	<ul style="list-style-type: none"> • It is important that programming recognizes and emphasizes peer bonds and leverages these for learning and for development of supportive interpersonal relationships 	<ul style="list-style-type: none"> • Programming can leverage the process of identity formation for supporting young people to explore in ways that are meaningful to them 	<ul style="list-style-type: none"> • Programming should recognize the developmental importance of autonomy and decision-making • Ideally, an approach in which autonomy grows as the adolescent grows should be adopted 	<ul style="list-style-type: none"> • Programming should recognize that stimulation is a developmental need • Adolescents who experience boredom in ways that are developmentally disruptive should be supported with stimulation and with opportunities for expression 	<ul style="list-style-type: none"> • Programming should emphasize the learning environment as a place that does not elicit a distress response • Programming should support the developmental necessity of learning, offering opportunities for 'catching up' where learning has been lost 	<ul style="list-style-type: none"> • Programming should recognize the differential impacts of adversity, violence and/or trauma on girls and boys, addressing behaviours with an acknowledgment of the difference

	<ul style="list-style-type: none"> • Where not possible, programming should support efforts aimed at self-regulation, distraction from difficult stimuli and acknowledgement of the difficulties adolescents are facing or have faced. This can support tolerance building 		<ul style="list-style-type: none"> • Through programs aimed at developing skills such as empathy (including through modelling of empathetic behaviours by teachers and caregivers), any disruptions that might have occurred might be mitigated 	<ul style="list-style-type: none"> • Programming needs to consider the bidirectional relationship between experience and personality formation, paying attention to individual needs that may require attention (eg. An adolescent displaying features of a borderline personality may require further support with emotional regulation and self-other individuation) 	<ul style="list-style-type: none"> • Efforts to remediate behaviour should note that adolescents should not be deprived of developmentally necessary needs 	<ul style="list-style-type: none"> • Efforts to identify specific needs (eg. Needs for strengthening of working memory in adolescents who struggle with retention) should be supported, including through capacity building • Programming should offer opportunities for learning that reach all learners where they are developmentally 	<ul style="list-style-type: none"> • Programming should focus on areas such as improving critical thinking capacity and supporting adolescents to make decisions that do not place them in positions vulnerable to harm • Where the behaviours of teens impinge on the rights or safety of others, programming should recognize that a rehabilitative lens is required for perpetrators, who may themselves have been exposed to sexual violence
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