

# Individual differences in children: Opening Pandora's Box

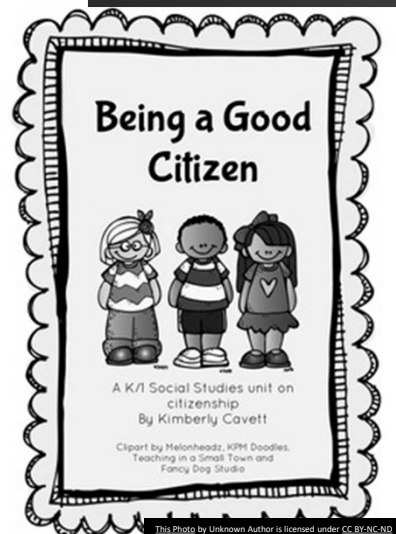
Dr Marilyn Hooley PhD

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## Children differ in many ways

**Understanding** and **anticipating** those differences

helps us to **optimise** children's outcomes



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## Ways that children differ:

### 1. Age/maturation

- We all mature in predictable ways
- The order of development is consistent, but the time it takes can vary

### 2. Genes

- We are not born 'blank slates'
  - Attributes/aptitudes
  - Intelligence; Temperament

### 3. Experiences

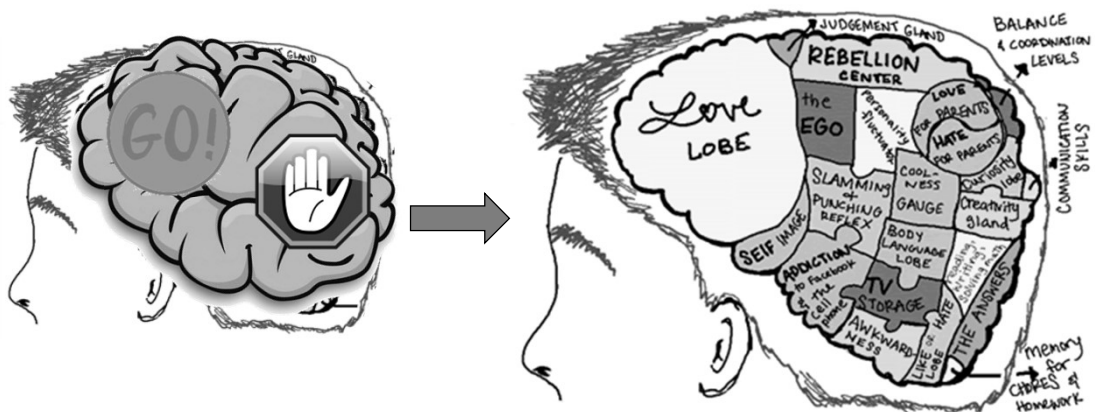
- Experiences interact with genetic predisposition
  - Experiences are influenced by our traits
  - Traits are influenced by our experiences

... so that our 'traits' become stronger as we mature



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We mature in predictable ways: Age helps us to estimate our stage of maturation



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Age approx.	Achievements	Learning experiences	Challenges
0-2 years	Rapid physical growth (*brain) Motor coordination Language/communication Basic emotional differentiation Autonomy Is the world a safe place? Am I consequential? What can I 'do'? What can I control? Who/where is my safe place?	Responsive caregiving Free play Trial & error play Observation Guided exploration	Emotional regulation Limited vocabulary Motor coordination Taking another's perspective • Peer sharing etc. Delaying gratification
2-6 years	Preoperational thinking (egocentric, rule-bound) shared play, friendships) Symbolic play, Motor coordination Language/communication Emotional regulation* Imagination Initiative What can I do? What am I good at?	Responsive caregiving Trial & error play Free play Observation/modelling Exploration Supported 'fails'	Emotional regulation Communication Fine motor coordination Perspective sharing • Peer sharing etc. Hypothesising – future casting, justifying

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Age approx.	Achievements	Learning experiences	Challenges
7-11 years	Concrete operational thinking • Beginning of logical thought • Decentration, reversibility, conservation Motor coordination Cooperative peer skills Can I achieve mastery? Social ramifications	Concrete problem solving Exploration/experimentation Physical challenges Opportunities to identify and achieve mastery/competence Supported social success	Abstract thinking
12-14 years	Formal operational thinking (abstraction, logical thought, what-if) Developing identity Puberty Outward/social focus Rule/boundary testing	Abstract problem solving Exploration/experimentation Physical challenges	Abstract thinking for some

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## Development: Same route but different arrival times

1. We do not all start with the same engines
2. Some have more optimal conditions than others



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## Children are not blank slates: Genetic inheritance

Eye colour



Illness, syndromes - risk

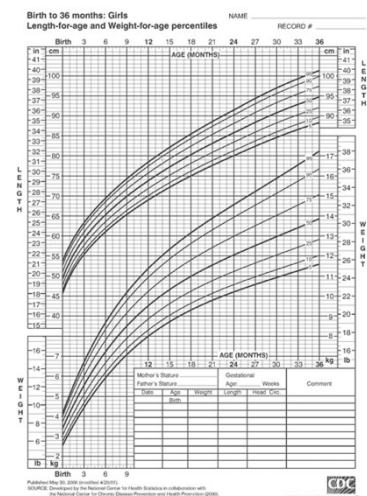
Height - range

Intelligence - range

Personality (temperament) - range

Etc.

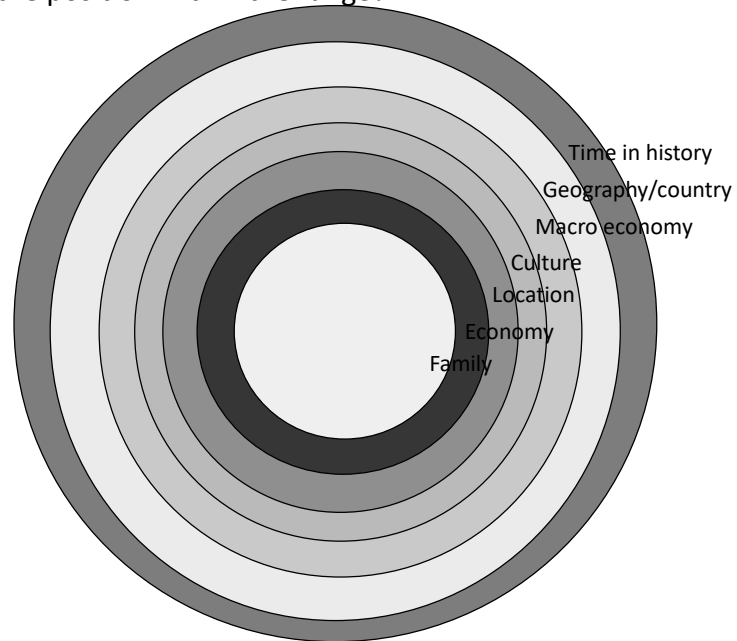
Determined by  
environment/experience



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What influences the position within the range?



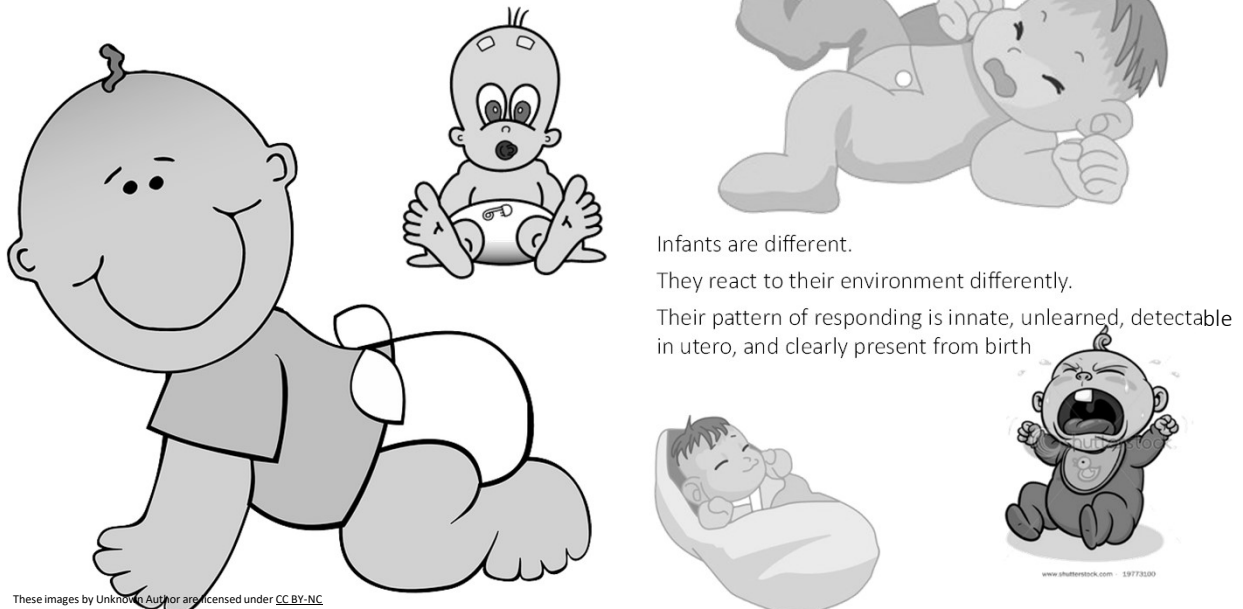
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You can help optimise range by:  
Managing child's characteristics  
Offering and encouraging opportunity seeking  
Supporting with encouragement and resources

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## Temperament



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## Temperament



- biologically based individual differences in emotion, motor, reactivity and self-regulation
- heredity, neural, and hormonal factors affect response to the environment.
- consistent across situations and over time
- can be modulated by environmental factors; parental response
- foundation/building blocks of personality

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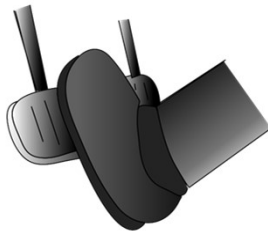
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At the most basic (and biological) level, innate individual differences in ...

Arousal systems



Inhibitory systems



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Who do you want to play with?

Who are you more inclined to help?

Who is going to have more positive social experiences?

Who is going to learn more social skills, have a broader social network, and have more opportunities?



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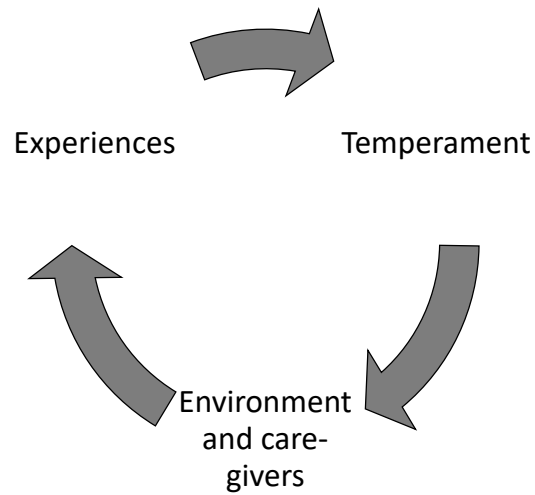
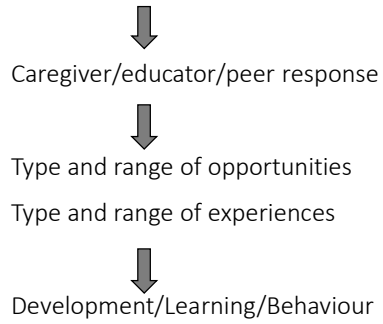
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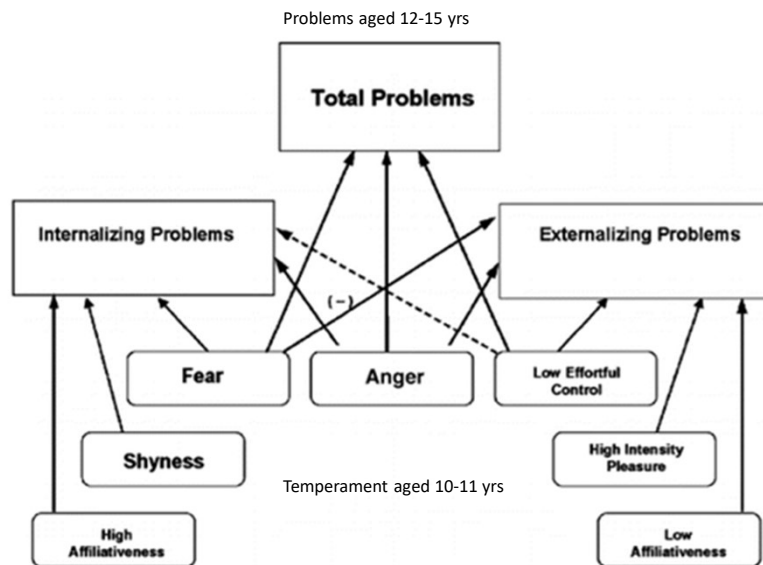
**Personality differences** in (for example):

- Emotional regulation
- Perspective taking/empathy
- Inhibitory control



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Early traits predictive of internalising and externalising disorders



Taken from Rothbart (2007) representing a synthesis of literature  
<https://doi.org/10.1111/j.1467-8721.2007.00505.x>

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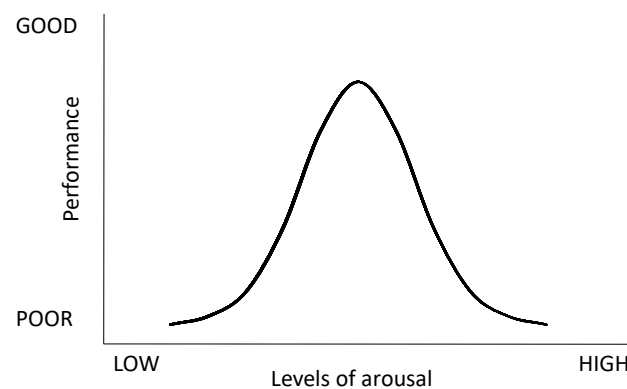
What can you do?: Findings from ATP (<https://aifs.gov.au/publications/australian-temperament-project>):

- Negative impacts of temperament can be moderated; e.g.,
  - Developing social and emotional resilience
  - Improving social skills,
  - Having quality parent and peer relationships,
  - Having positive school experiences,
  - etc.
- Many experiences in childhood and adolescence, such as **strong relationships, better control over emotions, and an interest in being involved in the community** help young people to flourish as they become adults
  - ➡ Modelling, Role play activities, 1:1 strategizing, teamwork activities, peer mentoring, encouragement, reinforcement, motivators

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## Optimal performance

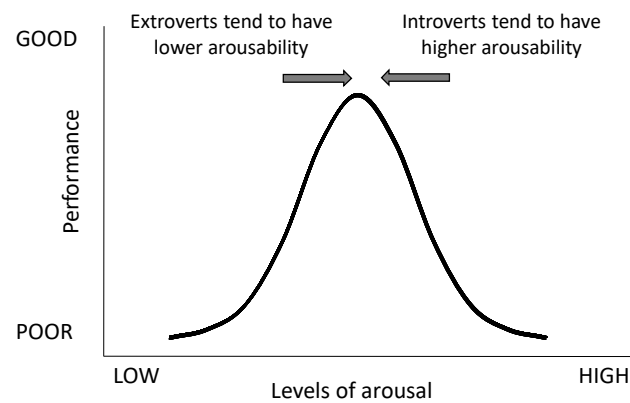
Yerkes-Dodson's Law: Our best performance occurs when we are moderately aroused



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## Introversion-extraversion

Eysenck proposed that people differ in how arousable their brains are  
One type is not 'better' than the other – they are simply different



So introverts and extroverts need different levels of external stimulation to function well

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**Introverts need LESS external stimulation to work well.**

**So they work better**

- Alone or in small groups
- In structured environments
- Limited distraction

**Extroverts need MORE stimulation to work well**

**So they work better**

- In groups
- Stimulating environments
- Can cope with distraction



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## Individual differences all happen in the brain

Genes influence how reactive different parts of the brain are

Experience creates connections between parts of the brain

## Let's see how experience actually shapes the brain

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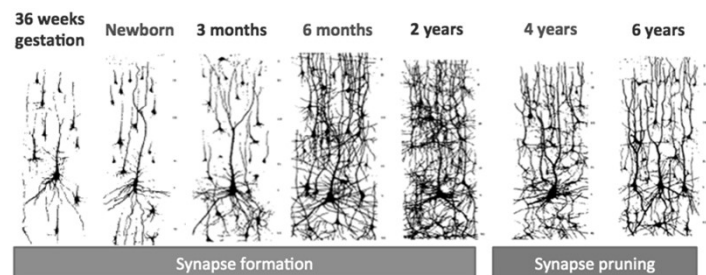
## Brain is plastic – it develops in response to experience

**Birth:** lots of cells; few connections

**Toddlerhood:** over-production of cells and connections

**Early childhood:** connections are selectively pruned and strengthened

- **Pruning:** decay in axons, dendrites, synapses that are not well used,
- **Strengthening:** well-used pathways are insulated (myelinated) to accelerate communication.



<https://universe-review.ca/R10-16-ANS12.htm>

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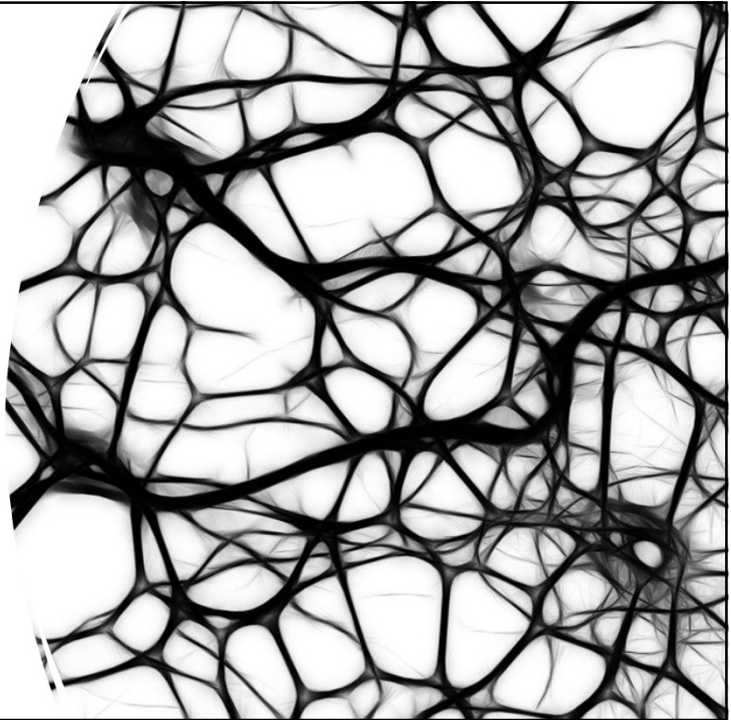
## Brain is plastic – it develops in response to experience

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‘Pruning’ and myelination help the brain to specialise/adapt to its environment

- Unused pathways decay
- Well-used pathways insulated and strengthened

Human brain has a slow developmental trajectory which **allows for development of a unique brain that is optimally adapted to its environment**



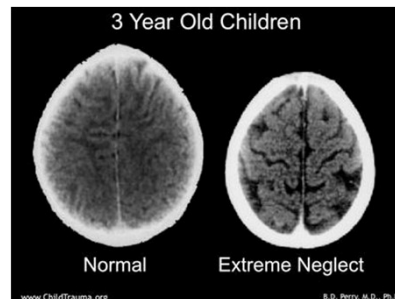
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**Supports optimal adaptation to our environment to ensure our survival**

**So what happens when this environment is not optimal?**

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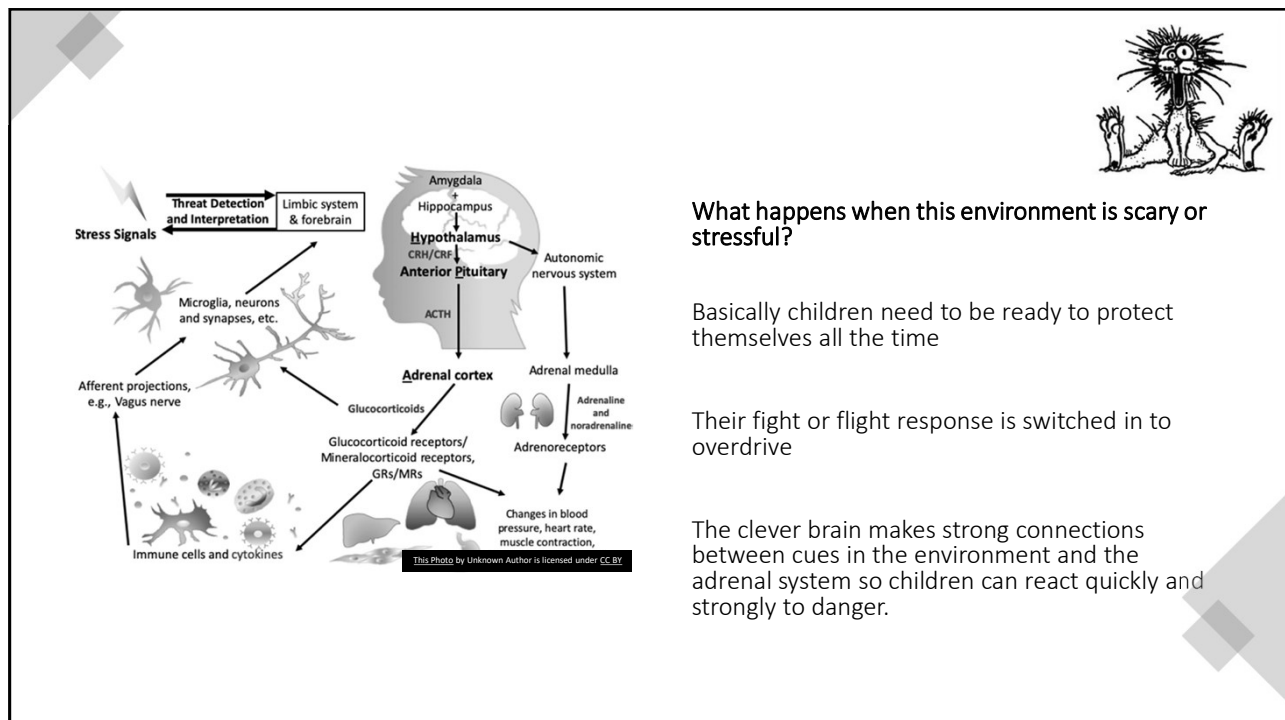
## What happens when the environment is neglectful?



- » Connections between neurons are not stimulated to form
- » Brain structures and connections are under developed, reducing:
  - thinking, learning, focusing attention, controlling emotion, managing stress, planning, monitoring, working memory, problem-solving, behavioural self-regulation, emotional regulation, stress regulation, attention, self control
  - Diminished brain activity and metabolism
    - Difficulty integrating and interpreting information
    - difficulty recognising emotions
    - Cognitive, social, and emotional deficits

<https://au.pinterest.com/pin/478718635363550148/>

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As a result, the fight/flight response ...

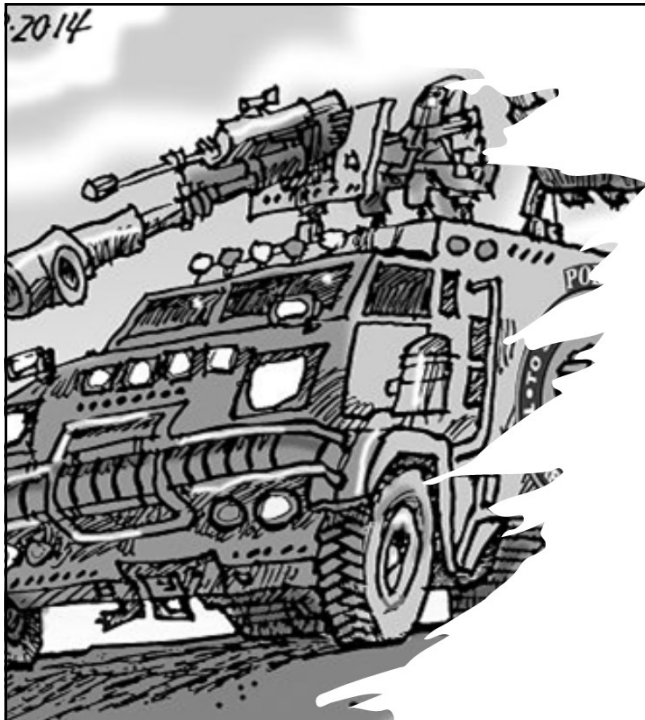


... becomes a super highway

Children become

- **hypervigilant** for danger,
- **hair-trigger response system** (lightening-fast fight/flight response)
- and have higher base-line cortisol levels (suppresses immune system)

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The emergency response system (limbic system) becomes super sensitive

- provides fast emergency responses (emotional survival drive)

So children ...

- Show **inappropriate responses to non-threatening stimuli**
- Have better memory for emotionally charged events
- Find it **difficult to calm down**, so prolonged reactions to stress occur (e.g., PTSD)

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### Children can also show

**Decreased** brain electrical activity, connection, and metabolism

- Making it difficult for them to integrate complex information

**Impaired development** of areas of the brain associated with learning, memory, executive functioning

This can affect children's

- Cognitive abilities,
- emotional regulation,
- emotion,
- social regulation,
- logic,
- attention to detail,
- language

**Children will often be** hypervigilant, impulsive, have poor emotional regulation, motor hyperactivity

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### What can you do?

- Provide a safe and calm environment for children to explore and learn
- Model, coach, encourage, reinforce, mentor, provide pleasurable experiences
- Link with other children and explicitly discuss rules for engagement

Create new brain pathways for these children that may hopefully, eventually replace the maladaptive ones

**If you feel that a child is at risk of abuse or neglect, follow organisational policy to report your concern**

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