



Some things about me...

My presentation draws on my professional life and expertise in the areas of human development and specifically in the area of paediatric brain development.

Many of us grew up in different times!

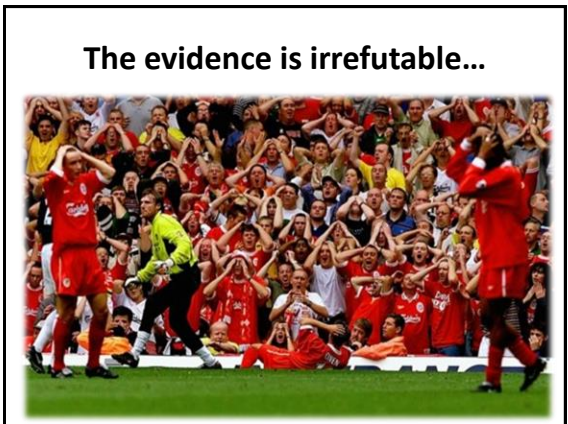
Luddites Unite

Important to consider....(Luddite or not)!

The foundation for this discussion is premised on the fact that smartphones and screen media are an enormous presence in young people's lives, a huge claim on their time and attention, and an element of their lives that is well worth our continued attention and scrutiny.

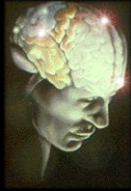
Important to consider...

- A fundamental aspect of child and adolescent development...and of life!
- Knowing how the brain develops!
- Technology, smartphones and development!
- The problem with smartphones....'smart' in function only!
- Making 'Awesome' decisions requires evidence and courage!



Brain development...nature and nurture

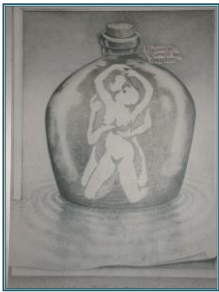
- **Experience-Expectant Growth**
 - Ordinary experiences “expected” by brain to grow normally
- **Experience-Dependent Growth**
 - Additional growth as a result of specific learning experiences



Experience expectant growth....



Experience dependent growth..



Research has shown that young children cannot identify the intimate couple because they have not had any environmental stimuli or prior memory associated with such a scenario.

Children see nine dolphins.

An important neurological concept...

Neuroplasticity!



The Brilliant Baby Brain

No Apps or Upgrades Needed!



Remember...

- The brain's plasticity is influenced by nature and nurture...
- The brain hardwires its neural architecture as a result of experiences...
- Experiences matter....



21st century experiences



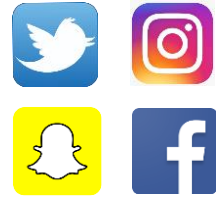
The age of *convergence*...



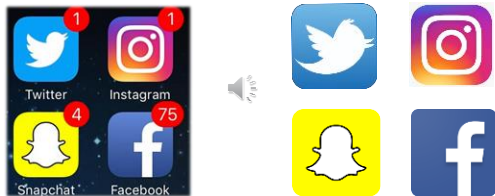
Smartphones and social media...



What drives the developers of social media?





What drives the developers of social media?




Student Well-being and Leadership Seminar....pilot study findings!

The surveys were done before the seminars were conducted!!!!

 - 11% (hourly access), 31% (daily access)
N=2088

 - 20% (hourly access), 50% (daily access)
N=2125

 - 34% (hourly access), 39% (daily access)
N=2133

Student Well-being and Leadership Seminar....pilot study findings!

- It is difficult for me to NOT regularly check my smartphone...
 - 26% strongly agreed or agreed to this statement (n=2137)
- Smartphone use is a problem for children and teenagers...
 - 49% strongly agreed or agreed...only 21% disagreed or strongly disagreed (n=2129)

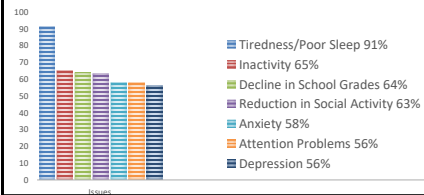


Are smartphones hazardous for young people (or you)?



Student Well-being and Leadership Seminar....pilot study findings!

I THINK SMARTPHONES CONTRIBUTE TO THE FOLLOWING ISSUES....(N=1372)



Too Much Screen Time?

- 50% of teens feel "addicted" to their mobile devices
- 72% of teens feel the need to immediately respond to texts, social-networking messages, and other notifications
- 78% of teens check their devices hourly



Source: Common Sense Media Survey 2016

Are smartphones hazardous for young people, given Silicon Valley's business model?

- Brain hacking and addiction
- Sleep disturbance
- Social isolation and related mental health issues



1. Brain hacking...

Silicon Valley has been in the business of engineering apps, smartphones, and other devices to **get people hooked**...the more an individual uses these platforms the more money the developers make.

Some programmers call it brain hacking... programmed methods of hijacking peoples' minds to form a habit. *In response to behaviour, design techniques are embedded inside the products to make smartphones so appealing that people use them, and other devices, more often.*



- Former Google Product Manager - [Tristan Harris](#)

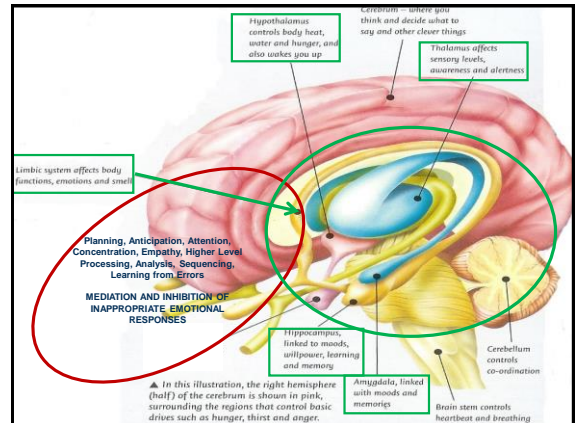
Brain hacking...



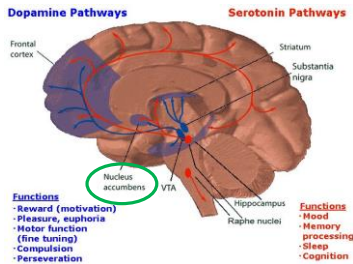
Brain imaging research shows that many screen activities, especially video games and social media can elevate dopamine in the brain!

Digital Cocaine?

Recent brain imaging research is showing that **smartphones affect the brain's frontal cortex** — which controls executive functioning, including impulse control — in exactly the same way that cocaine does...Technology is so hyper-arousing that **it raises dopamine levels** — the feel-good neurotransmitter most involved in the addiction dynamic!



Chemistry of dependency...



What happens if you're not getting your digital fix?



Reinforcement of Dependency and Elevation of Cortisol

If you place food out at exactly 7:15 am every day, Scrat will come at exactly that time and not come at any other time



If the food is present only when the yellow light is on, Scrat will check for food only at that time



If the food is randomly available at no specific time and with no cues, Scrat can't predict when it will come and checks for food every few minutes— just like e-mails and SMS messaging... this elevates cortisol and builds anxiety...not very healthy!



2. Sleep disturbance...

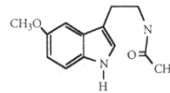


Student Well-being and Leadership Seminar....pilot study findings!

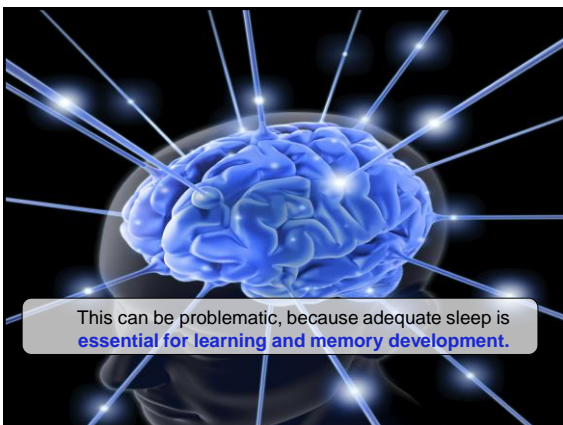
- Do you usually turn your phone off at night?
 - 40% No
 - 20% Sometimes
- Having my phone close to me while I'm sleeping is a comfort
 - 21% strongly agreed or agreed (n=2135)
- 91% of 1,372 students believed that smartphones contribute to poor sleep and/or tiredness

Smartphones, developing brain and sleep...

MELATONIN



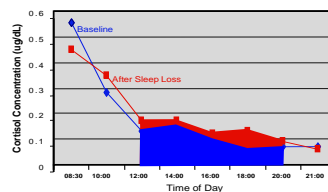
Wait there's more...



This can be problematic, because adequate sleep is essential for learning and memory development.

Lack of sleep raises stress hormones...

Sleep Loss Increases Afternoon Cortisol Levels



Omside, Buxton & Rusak, *Physiol. Behav.*, 2010

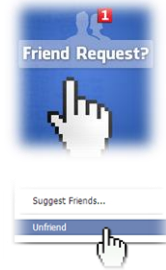
3. Social isolation...

- *Depression, anxiety and lack of self-confidence*
- *Aggressive thoughts*
- *Separation from reality - psychosis*



4 ways social media contributes to social isolation...

1. *Social media promotes and provides distraction from real life!*
2. *Social media offers the illusion of companionship and/or social connection!*
3. *Social media can negatively affect self-image so individuals avoid real contact!*
4. *Social media reduces the intimacy of relationships!*



Here's a paradox...

*Social media is not very social after all...turns out that that over time **the more technologically connected people are, the more isolated they feel...***



*People also become a **commodity** to be liked, shared or 'unliked', and when people see others as mechanisms for enhancing their perceived significance their chances for engaging in meaningful 'real' relationships are diminished as is their sense of well-being.*

The evidence is irrefutable...

All aspects of development thrive through positive face-to-face social interactions...we are social beings!



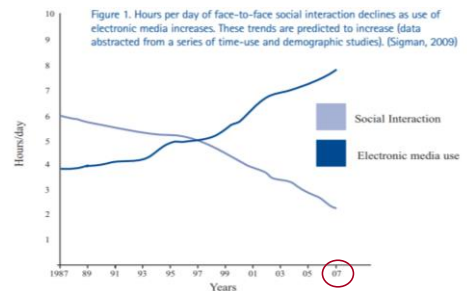
We are social beings and learn and thrive with others....

Decades of research tells us that we need social connection as much as we need oxygen!

Importantly, social connection is about human contact not virtual contact!



Reduction in real life contact...



Sigman, A. (2009) Well Connected? The Biological Implications of 'Social Networking' The Biologist, 56(1): 14-20

Reduction in real life contact...

Quite simply...

Being with others facilitates happiness and feelings of belonging and self worth...the evidence of this is irrefutable!

Isolation makes us ill!

Screen activities are linked to more loneliness and non-screen activities are linked to less loneliness!!

Social media use appears to exacerbate a sense of loneliness and this occurs in all demographics.

Today, teens who spend more time on screens and engaging with social media are more likely to be depressed...especially those who need to be 'liked' or 'followed' or have their lives recognised via social media...they may be more connected and yet more lonely.

We are social beings and learn and thrive with others....

Relationships and personal contact help to release **oxytocin** and enhance the uptake of **serotonin** in the brain!



Many of us grew up in different times!



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More to consider....(Luddite or not)!

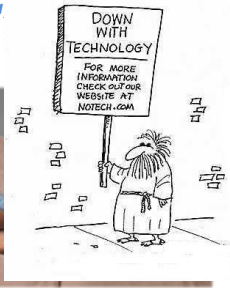
- Too often discussion of screen media, children and teens is dominated almost entirely by experts in media studies and e-learning. Yet, *their expertise is not in child health, but in media and how children interact with it.*
- For child development experts, psychologists and neuroscientists, *it is the medium itself that is concerning us*, and not merely the content of young children's experiences with screen media. This concern is not based on an anti-technology or anti-television philosophy. *The concerns are based purely on the premature use or overuse of screen media in young people whose brains and bodies are not yet fully formed.*
- Research published in the world's most reputable medical and scientific journals shows that the sheer amount of time children spend watching TV, DVDs, computers and the internet is linked with significant measurable biological changes in their bodies and brains that are having *significantly negative medical and psychological consequences.*
- For example...

Evidence linked to social media and smartphone use...

- A 2015 University of Houston study published in the *Journal of Social and Clinical Psychology* confirmed that *Facebook usage can lead to depressive symptoms.*
- A 2014 study called "Facebook's Emotional Consequences: Why Facebook Causes a Decrease in Mood and Why People Still Use It," showed that the *longer people are actually on Facebook, the more negative their mood is afterward.*
- In a 2010 Case Western Reserve University School of Medicine study found that *"hypernetworking" teens – those who spend more than three hours per school day on social networking sites – were linked to higher rates of depression, substance abuse, poor sleep, stress, poor academics and suicide.*
- According to a 2015 Pew Research Center study of millennial communication habits, published in the American Psychological Association's journal *Psychology of Popular Media*, "Text messaging has increased dramatically over the past 10 years," and *many teenage texters share addict-like symptoms and behaviours.*
- A 2014 study published in the journal *Social Indicators Research*, by Dr. Jean M. Twenge, analyzed data from nearly seven million teenagers and adults from across the country and found that more people reported symptoms of depression than in the 1980s. According to that study, *teens are 74 percent more likely to have trouble sleeping and twice as likely to see a professional for mental health issues than their 1980s counterparts.*

What to do...making **AWESOME** decisions!

- Screen time must now be considered a major public health issue and reducing screen time must become the new priority for child and adolescent health.
- For parents...time to parent your child's use of the phone...a smartphone is not a 'right'!



A final thought.... Wisemen?



Some books by Dr Michael C Nagel



In the Middle: The Adolescent Brain, Behaviour and Learning
Available at most university bookstores, Amazon or via the link below:
<https://shop.acer.edu.au/acer-shop/product/A5320BK>



In the Beginning: The Brain, Early Development and Learning
Available at most university bookstores, Amazon or via the link below:
<https://shop.acer.edu.au/acer-shop/product/A5268BK>



Nurturing a Healthy Mind: Doing What Matters Most For Your Child's Developing Brain
Available at most bookstores, Amazon or via the link below:
<http://www.exislepublishing.com.au/Nurturing-a-healthy-Mind.html>



Boys Stir Us: Working WITH the Hidden Nature of Boys
Available at most bookstores, Amazon or via the link below:
<http://www.hbe.com.au/boys-stir-us-working-with-the-hidden-nature-of-boys-0pub.html>



Understanding Development and Learning: Implications for Teaching
Available at most bookstores, Amazon or via the link below:
https://www.oup.com.au/search/?i.Tabs%7Ctype=products&meta_b=9780195519655



It's a Girl Thing
Available at most bookstores, Amazon or via the link below:
<http://www.hbe.com.au/it-s-a-girl-thing-1.html>