

## Reflections on the Increase in Autism, ADHD, Anxiety, and Depression: Part 1 – Bonding, Screen Time, and Circadian Rhythms

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### Abstract

Over the past 2 decades, there has been a significant increase in the prevalence of autism, attention-deficit/hyperactivity disorder (ADHD), anxiety, depression, and pediatric suicidal behavior. Based upon the evolutionary perspectives of Nassim Taleb and educator Joseph C. Pearce, discussed are three identified behavioral risk factors that may contribute to activate, maintain, and increase the prevalence and severity of these disorders. These include the reduction of infant and caretaker bonding, increase in screen time, and disruption of circadian rhythms. Prevention strategies are suggested to reduce the risk factors.

**Keywords:** autism; ADHD; anxiety; screen time; circadian rhythm; prevention

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### Introduction

Over the past 2 decades, there has been a significant increase in the prevalence of autism, attention-deficit/hyperactivity disorder (ADHD), anxiety, depression, and pediatric suicidal behavior. Autism rates have risen from 1 in 150 children in 2000 to 1 in 36 children in 2020 (CDC, 2023), while ADHD rates have increased from 6% in 1997 to approximately 10% in 2018 (CDC, 2022). The rates of anxiety among 18- to 25-year-olds have also increased from 7.97% in 2008 to 14.66% in 2018 (Goodwin et al., 2020), and depression rates for U.S. teens ages 12–17 have increased from 8% in 2007 to 13% in 2017 (Geiger & Davis, 2019; Walrave et al., 2022). Pediatric suicide attempts have also increased by 163% from 2009 to 2019 (Arakelyan et al., 2023), and during the COVID-19 pandemic, these rates have increased by more than 25% (WHO, 2022; Santomauro et al., 2021). In addition, the prevalence of these disorders has

tripled for U.S. adults during the pandemic compared to before (Ettman et al., 2020).

The rapid increase of these disorders is not solely due to improved diagnostic methods, genetic factors, or the COVID-19 pandemic. The pandemic amplified preexisting increasing trends. More likely individuals who were at risk had their disorders triggered or amplified by harmful environmental and behavioral factors. Conceptually, genetics loads the gun; epigenetics, behavior, and environment pull the trigger.

While behavioral strategies such as neurofeedback, cognitive behavior therapy, biofeedback, meditation techniques, and pharmaceuticals can treat or ameliorate these disorders, the focus concurrently needs to be on prevention and risk reduction. In some ways, treatment can be likened to closing the barn doors after the horses have bolted.

### Evolutionary Perspective to Reduce Risk Factors

Nassim Taleb (2012) in his book, *Antifragile: Things That Gain from Disorder (Incerto)*, provides an evolutionary perspective and offers simple rules of health by reducing risk factors:

- Assume that anything that was not part of our evolutionary past is probably harmful.
- Remove the unnatural or unfamiliar (e.g., smoking or e-cigarettes, sugar, digital media).
- We do not need evidence of harm to claim that a drug or an unnatural (via positive) procedure is dangerous. If evidence of harm does not exist, it does not mean harm does not exist.
- Only resort to medical techniques when the health payoff is very large (to save a life) or exceeds its potential harm, such as incontrovertibly needed surgery or lifesaving medicine (penicillin).
- Avoid the iatrogenics and negative side effects of prescribed medication.

Taleb's suggestions are reminiscent of the perspective described by the educator Joseph C. Pearce (1993) in his book, *Evolution's End*. Pearce argued that modern lifestyles have negatively affected the secure attachment and bonding between caregivers and infants. The lack of nurturing and responsive caregiving in early childhood may lead to long-term emotional and psychological problems. He points out that we have radically adapted behaviors that differ from those that evolved over thousands of generations and that allowed us to thrive and survive. In the last 100 years, babies have often been separated from their mothers at birth or early infancy by being put in a nursery or separate room, limited or received no breastfeeding with the use of formula, exposed to television for entertainment, lacked exploratory play outdoors, and absent of constant caretakers in high-stress and unsafe environments.

As Pearce pointed out:

If you want true learning, learning that involves the higher frontal lobes—the intellectual, creative brain—then again, the emotional environment must be positive and supportive. This is because at the first sign of anxiety the brain shifts its functions from the high, prefrontal lobes to the old defenses of the reptilian brain.

These young people need audio-vocal communication, nurturing, play, body movement, eye contact, sweet sounds and close heart contact on a physical level. (Mercogliano & Debus, 1999)

To optimize health, eliminate or reduce those factors that have significantly changed or were not part of our evolutionary past. The proposed recommendations are based upon Talib's perspective that anything that was not part of our evolutionary past is probably harmful; thus, remove the unnatural or unfamiliar and adapt the precautionary principle which states that if evidence of harm does not exist, it does not mean harm does not exist (Kriebel et al., 2001). This article is the first of a two-part series. Part 1 focuses on increasing reciprocal communication between infant and caretaker, reducing screen time, and reestablishing circadian rhythms. Part 2 focuses on reducing exposure to neurotoxins, processed foods, and supporting the human biome.

### Part 1 – Increase Bonding, Reduce Screen Time, and Reestablish Circadian Rhythms

#### Increase Bonding Between Infant and Caretaker

Infants develop emotional communication through reciprocal interactions with their caregiver, during which the caregiver responds to the infant's expressions. When this does not occur, it can be highly stressful and detrimental to the infant's development. Unfortunately, more and more babies are emotionally and socially isolated while their caregivers are focused on and captured by the content on their digital screens. Moreover, infants and toddlers are entertained (babysat) by cellphones and tablets instead of dynamically interacting with their caretakers. Screens do not respond to the child's expressions; the screen content is programmed to capture the infant's attention through rapid scene changes. Without reciprocal interaction, babies often become stressed, as shown by research conducted by developmental psychologist Professor Edward Tronick, who conducted the "Still Face" experiment (Tronick & Beeghly, 2011; Weinberg et al, 2008).

The Still Face experiment illustrated what happened when caregivers did not respond to infants' communication. The caregivers were asked to remain still and unresponsive to their babies, resulting in the infants becoming increasingly distressed and disengaged from their surroundings. Not only does this apply to infants but also to children, teenagers, and older individuals. Watch the

short Still Face experiment which illustrates what happens when caretakers do not respond to the infants' communication.

[https://www.youtube.com/watch?v=vmE3NfB\\_HhE](https://www.youtube.com/watch?v=vmE3NfB_HhE)

**Recommendation.** Do not use cellphone and digital media in the first 2 years of life while being with an infant. It is important for caregivers to limit their cellphone use and prioritize reciprocal interactions with their infants for healthy emotional and psychological development.

**Figure 1.** Reduce Screen Time (Television, Social Media, Streaming Videos, Gaming)



**Note.** The critique of social media does not imply that there are no benefits. If used judiciously, it is a powerful tool to connect with family and friends or access information needed.

From an evolutionary perspective, screen time is an entirely novel experience. Television, computers, and cellphones are modern technologies that have significantly impacted infants and young people's development. To grow, infants, toddlers, and children require opportunities to explore the environment through movement, touch, and play with others, which is not possible with screen time. Research has shown that excessive screen time can negatively affect children's motor development, attention span, and socialization skills, as well as contribute to obesity and other health problems (Carson et al., 2016; Hinkley et al., 2014; Mark, 2023).

When 4-year-olds watch fast-paced videos, they exhibit reduced executive functions and impulse control, which may be a precursor for ADHD, compared to children who engage in activities such as drawing (Lillard & Peterson, 2011; Mark, 2023). Furthermore, excessive screen time and time spent on social media are causal in increasing depression as was discovered when Facebook became available at selected universities.

Researchers compared the mental health of students at similar universities where Facebook was or was not available and observe how the students'

mental health changed when Facebook became available (Braghieri et al., 2022). Their research showed that

college-wide access to Facebook led to an increase in severe depression by 7% and anxiety disorders by 20%. In total, the negative effect of Facebook on mental health appeared to be roughly 20% the magnitude of what is experienced by those who lose their job. (Walsh, 2022)

Exposure to digital media has also significantly reduced our attention span from 150 s in 2004 to an average of 44 s in 2021. The shortening of attention span may contribute to the rise of ADHD and anxiety (Mark, 2023, p. 96).

**Recommendations.** Reduce time spent on social media, gaming, mindlessly following one link after the other, or watching episode after episode of streaming videos. Instead, set time limits for screen use, turn off notifications, and prioritize in-person interactions with friends, family, and colleagues while engaging in collaborative activities. Encourage children to participate in physical and social activities and explore nature.

To achieve this, follow the guidelines from the American Academy of Pediatrics' recommendation on screen time (Council on Communications and Media, 2016), which suggests limiting screen time for children of different age groups:

- Children under 18 months of age should avoid all screen time, except for video chatting with family and friends.
- Children aged 18–24 months should have limited screen time and only watch together with a caretaker.
- Children aged 2–5 years should have no more than 1 hr of screen time per day with parental supervision.
- For adolescents, screen and social media time should be limited to no more than an hour a day.

In our experience, when college students reduce their time spent on social media, streaming videos, and texting, they report that it is challenging; however, they then report an increase in well-being and performance over time (Peper et al., 2021). While it may require more effort to provide children with actual experiential learning and entertainment than allowing them to use screens, having children perform activities and play outdoors (a green environment) appears to reduce ADHD symptoms (Louv, 2008; Kuo & Taylor, 2004).

### Reestablish Circadian (Daily) Rhythms

Our natural biological and activity rhythms were once regulated by natural light until the 19th century. It is hard to imagine not having light at night to read, work on the computer, or answer email. However, light not only illuminates but also affects our physiology by regulating our biological rhythms. Exposure to light at night can interfere with the production of melatonin, which is essential for sleep. Insufficient sleep affects 30% of toddlers, preschoolers, school-age children, and the majority of adolescents. The more media is consumed at bedtime, the more delayed bedtime and reduced total sleep occur (Hale et al., 2018). Reduced sleep is a contributing factor to increased ADHD symptoms of inattention, hyperactivity, and impulsivity (Cassoff et al., 2012).

**Recommendations.** Support the circadian rhythms. Avoid screen time an hour before bedtime. This will reduce exposure to blue light and also reduce the sympathetic arousal triggered by the content on the screen or reacting to social media and emails. Sleep in total darkness and establish a regular bedtime and waking time to avoid social jetlag, which can negatively affect health and performance (Caliandro

et al., 2021). Implement sleep hygiene strategies such as developing a bedtime ritual can also improve sleep quality (Stager et al., 2023; Suni, 2023). Thus, go to bed and wake up at the same time each day, including weekends as well as avoiding large meals, caffeine, and alcohol before bedtime. Consistency is key to success.

### Conclusion

To optimize health, eliminate or reduce those factors that have significantly changed or were not part of our evolutionary past and explore strategies that supports our behaviors that have allowed the human being to thrive and survive. Improve clinical outcome and optimize health by enhancing reciprocal communication interactions, reducing screen time, and reestablishing the circadian rhythm.

### Author Disclosure

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