

DOPAMINE NATION: Finding Balance in the Age of Indulgence

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Dakota Medical Foundation Summit

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Disclosures

- I do not receive any funding, fees, stock options, or other compensation from companies that make, market, or disseminate medical products.
- I have been retained as a medical expert witness in federal, state, and county opioid litigation against opioid manufacturers, distributors, and pharmacies.

Learning objectives

- The Pleasure-Pain Balance: How It Works
- The Plenty Paradox: The Mismatch between our Primitive Wiring and the Modern Ecosystem
- What to Do About It: Abstain, Maintain, Seek out Pain

The Pleasure-Pain Balance

The reward circuit

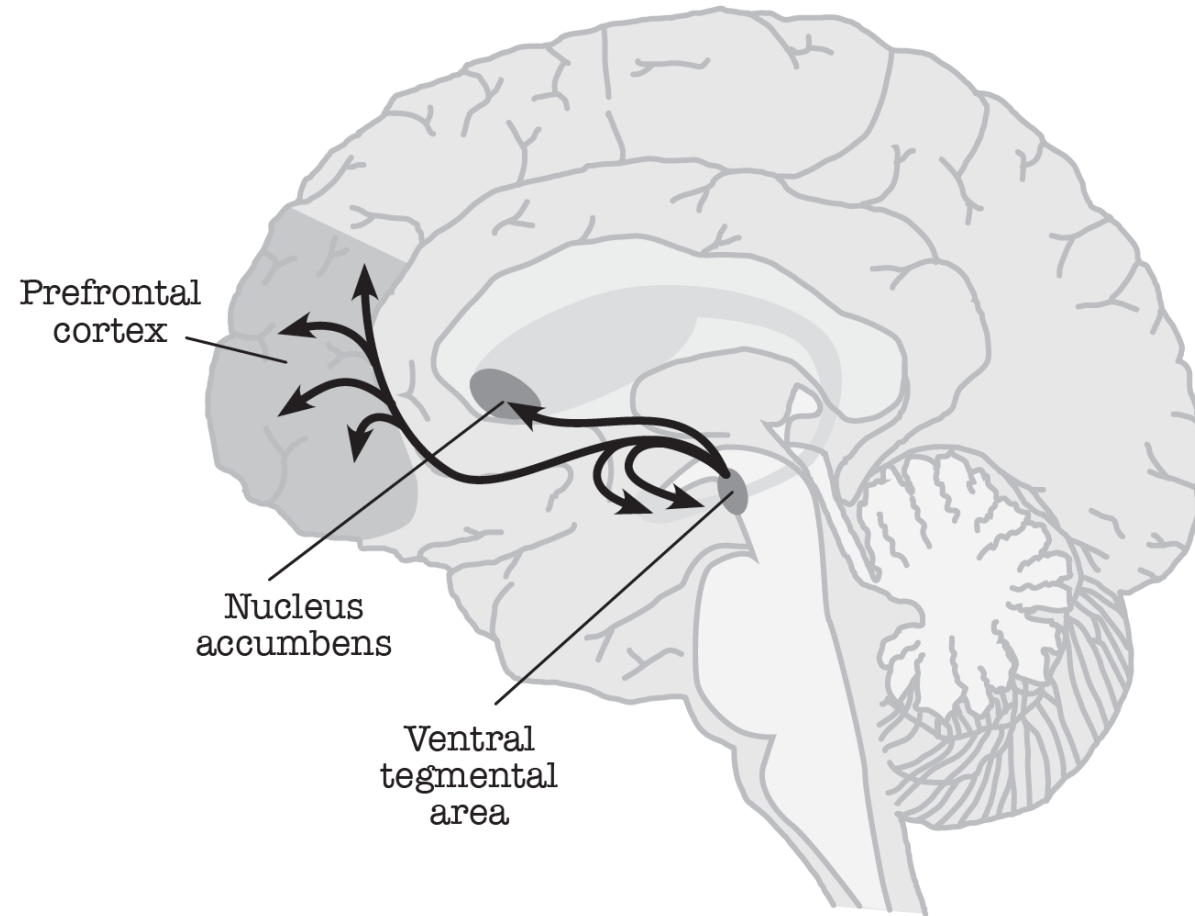


Image from *Dopamine Nation: Finding Balance in the Age of Indulgence*,
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Dopamine as a human neurotransmitter

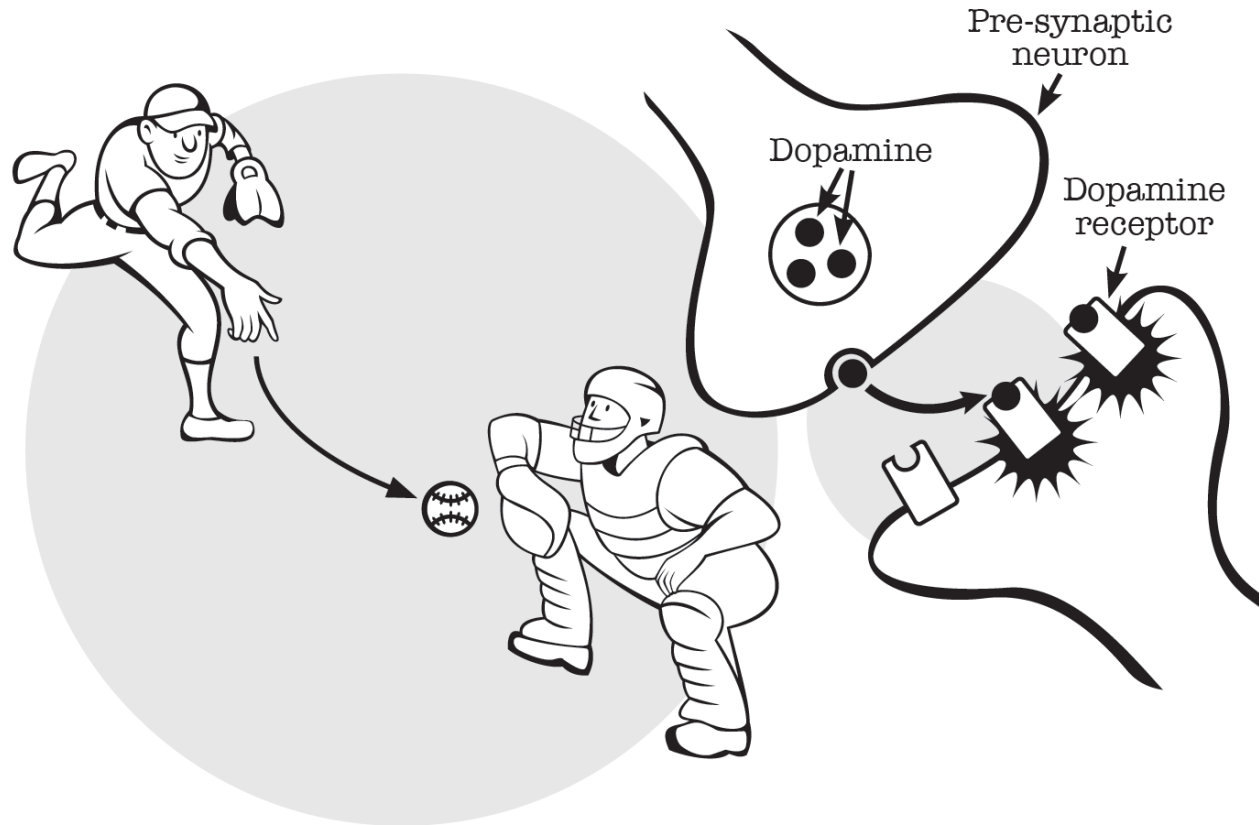


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Dopamine as a universal currency



REWARDS AND DOPAMINE RELEASE

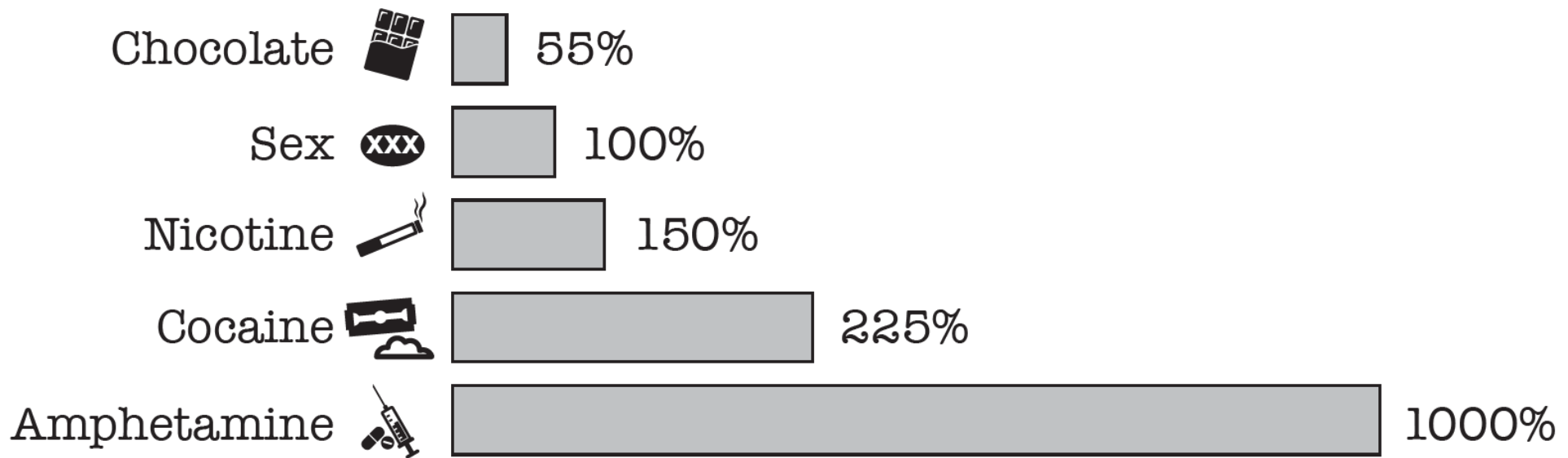
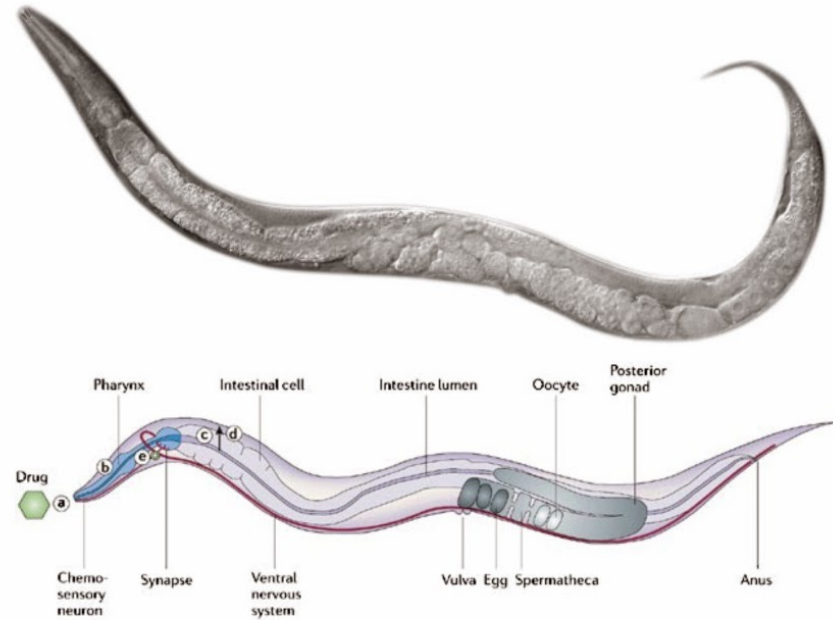


Image from *Dopamine Nation: Finding Balance in the Age of Indulgence*,
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Dopamine and movement



Caenorhabditis elegans
(*C. elegans*)



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The Pleasure Pain Balance



Image from Lembke, Anna. *Dopamine Nation: Finding Balance in the Age of Indulgence*,
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The opponent-process mechanism

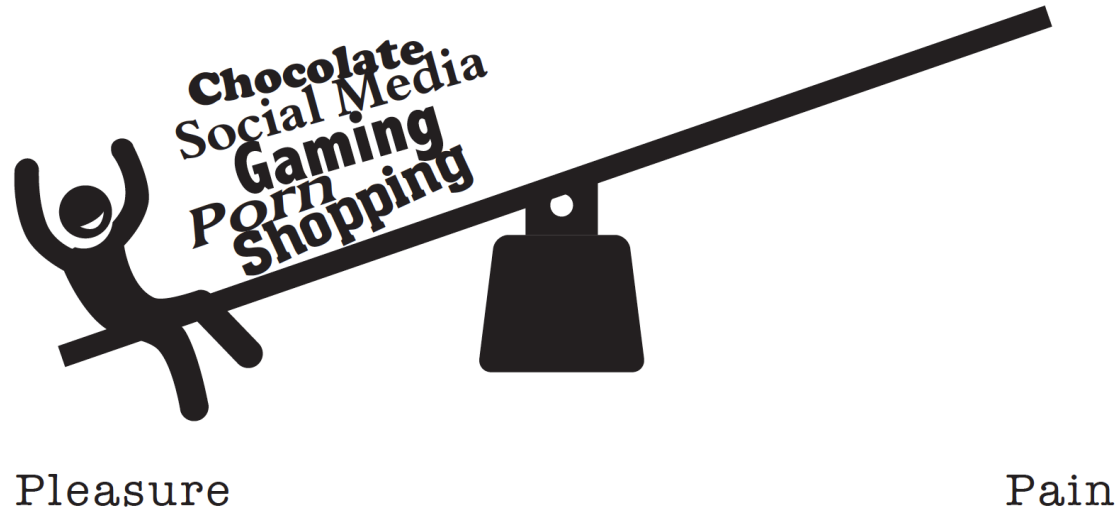


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The opponent-process mechanism



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Neuroadaptation

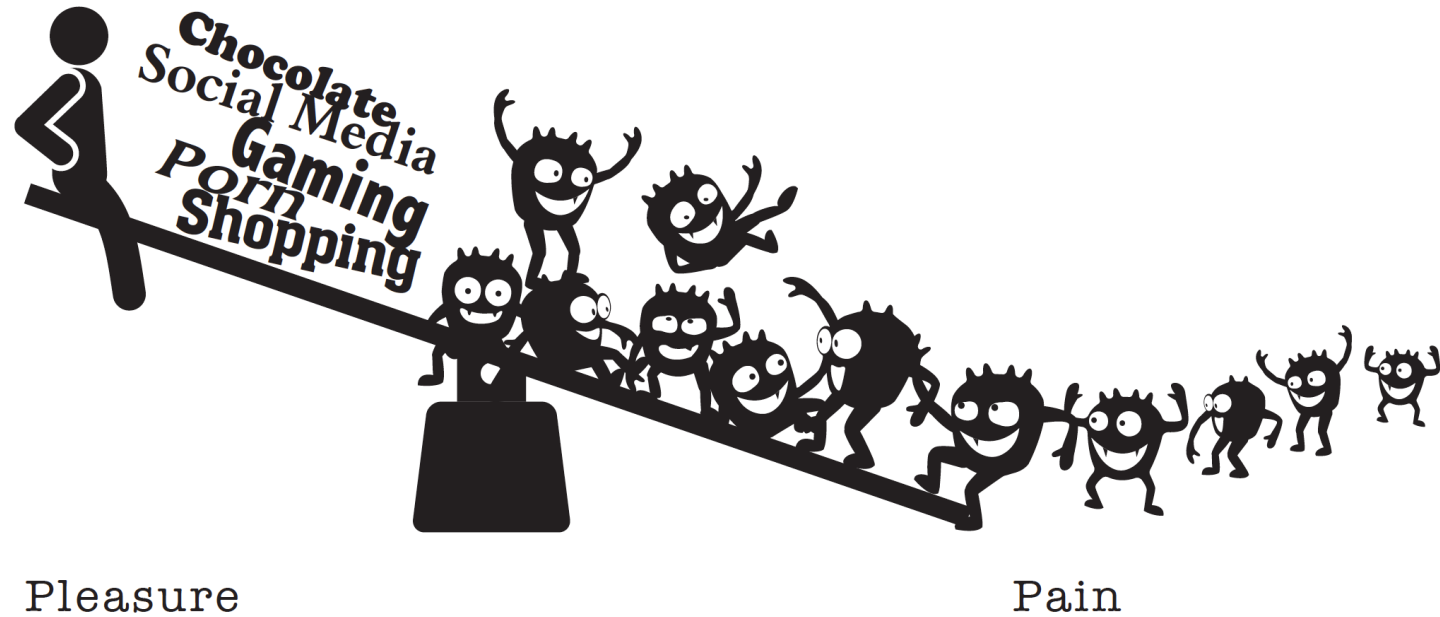


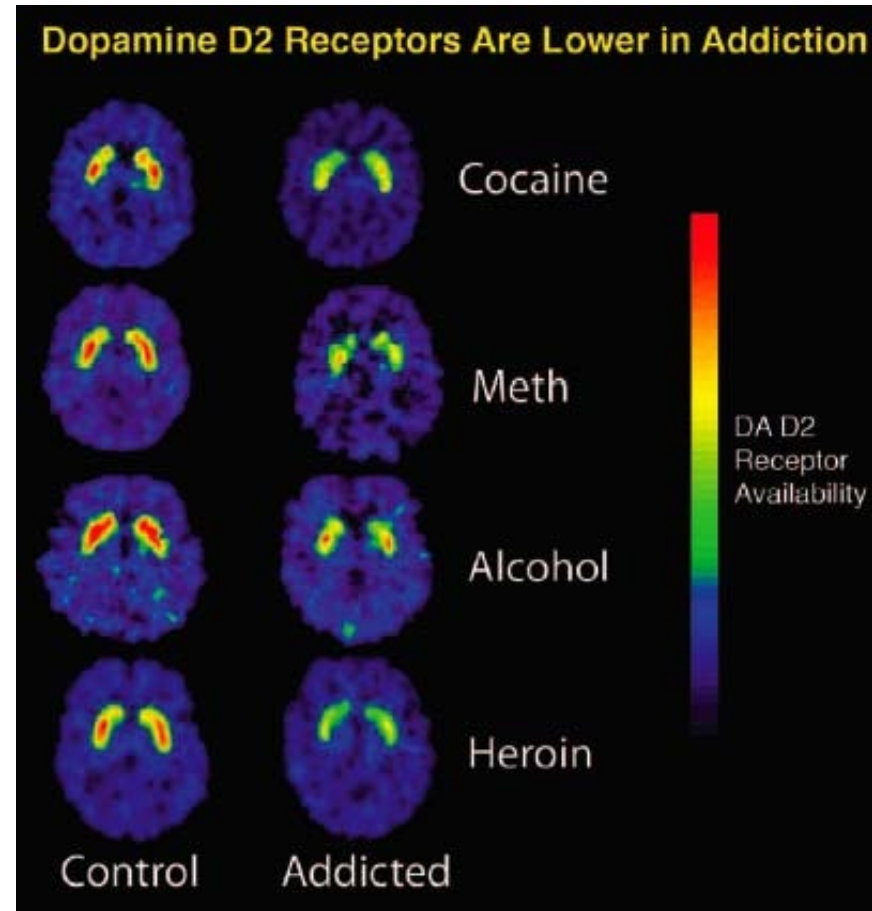
Image from Lembke, Anna. *Dopamine Nation: Finding Balance in the Age of Indulgence*,
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Changing the hedonic setpoint



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Dutton Penguin Random House, 2021

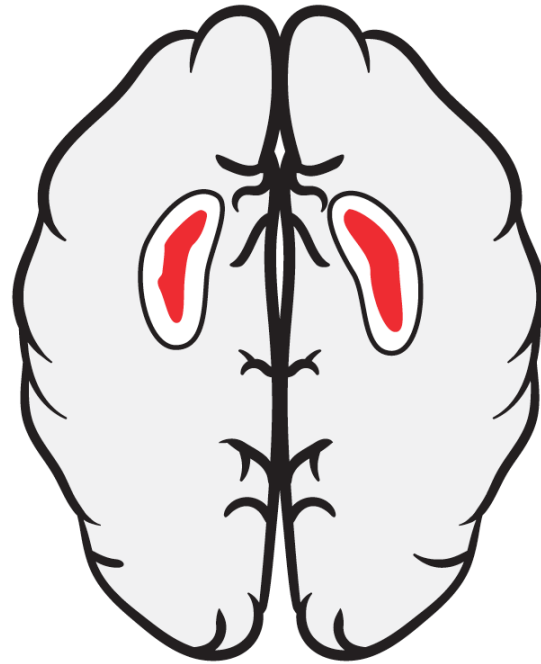
The dopamine-deficit state



Volkow ND, et al, Behavioural Pharmacology
2002;13:355–366

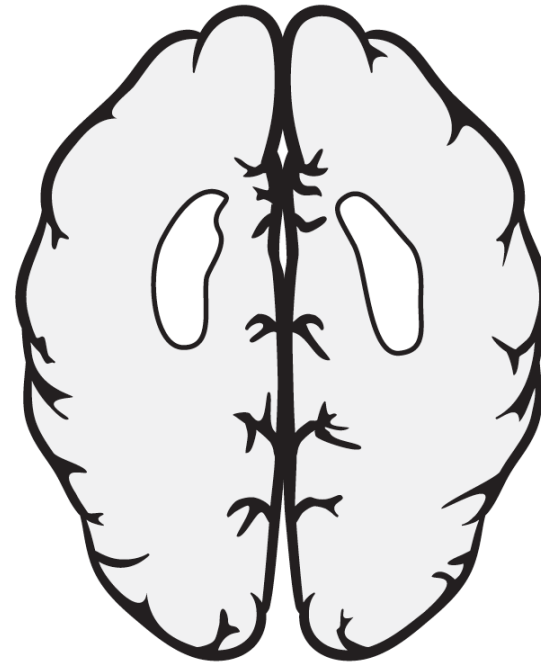
DOPAMINE ACTIVITY

Normal



Unexposed
to opioids

Impaired



2 weeks after
opioid exposure ends

Image from Lembke, Anna. *Dopamine Nation: Finding Balance in the Age of Indulgence*,
Dutton Penguin Random House, 2021

The balance remembers

DOPAMINE LEVELS: ANTICIPATION AND CRAVING

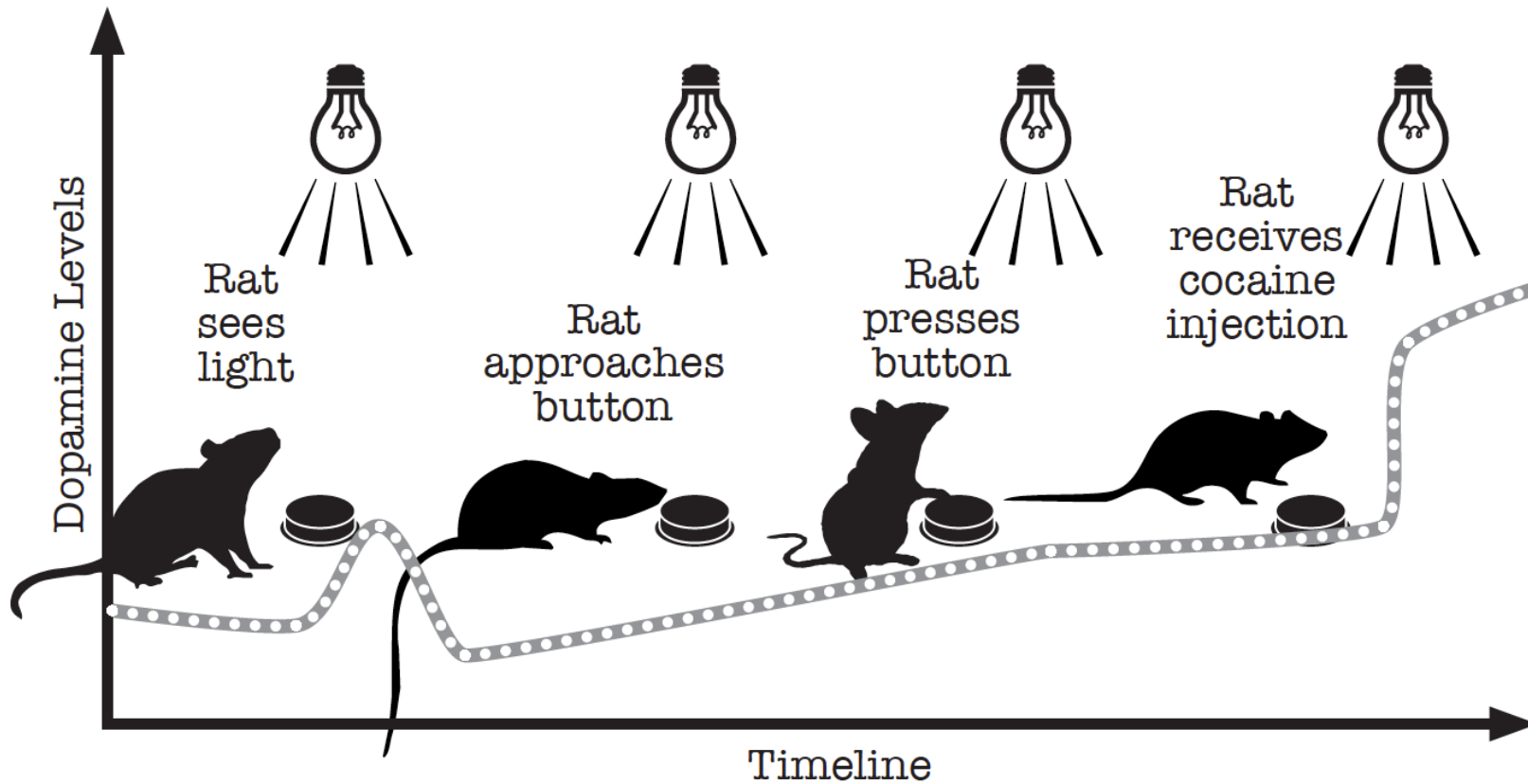


Image from Lembke, Anna. *Dopamine Nation: Finding Balance in the Age of Indulgence*, Dutton Penguin Random House, 2021

DOPAMINE LEVELS: ANTICIPATION AND CRAVING

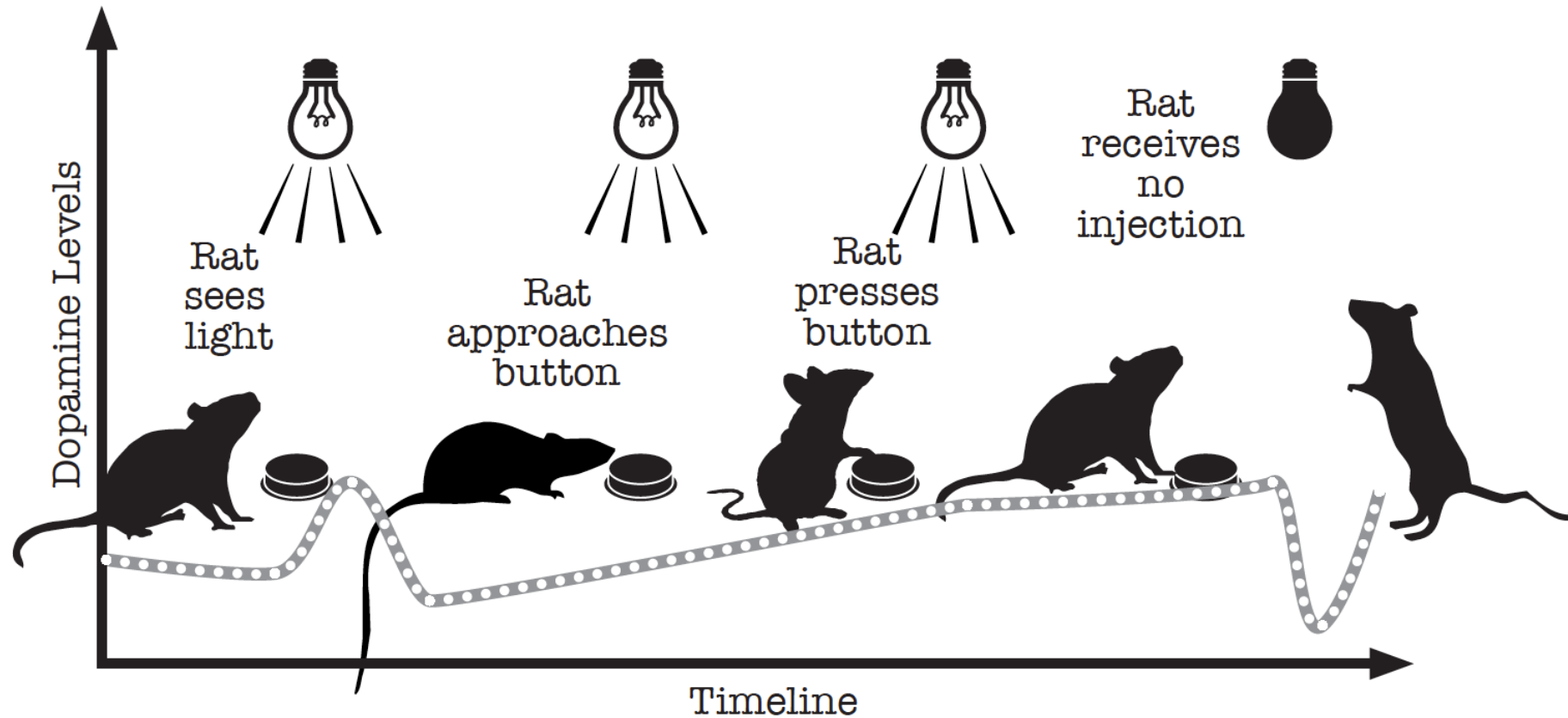
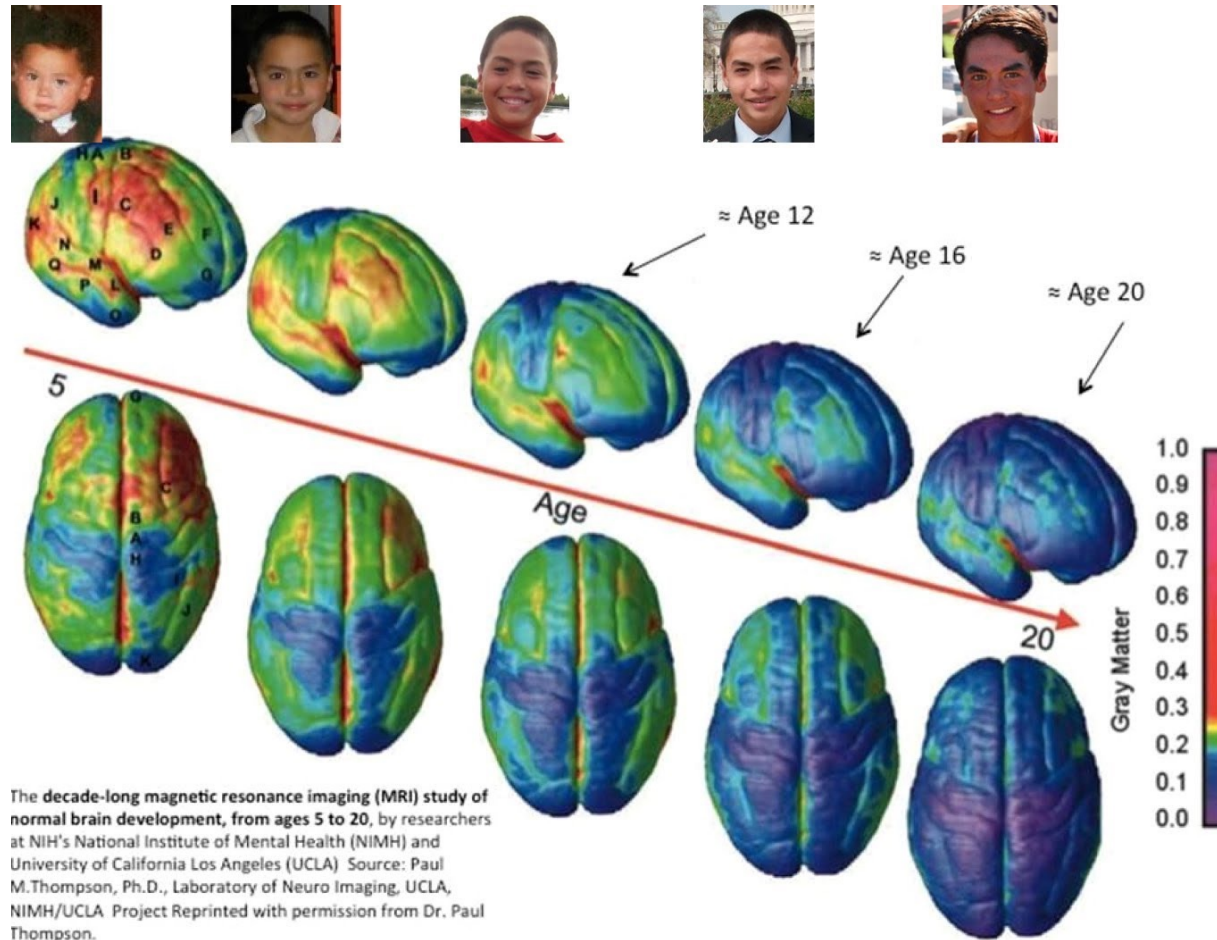


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Dutton Penguin Random House, 2021

The developing brain



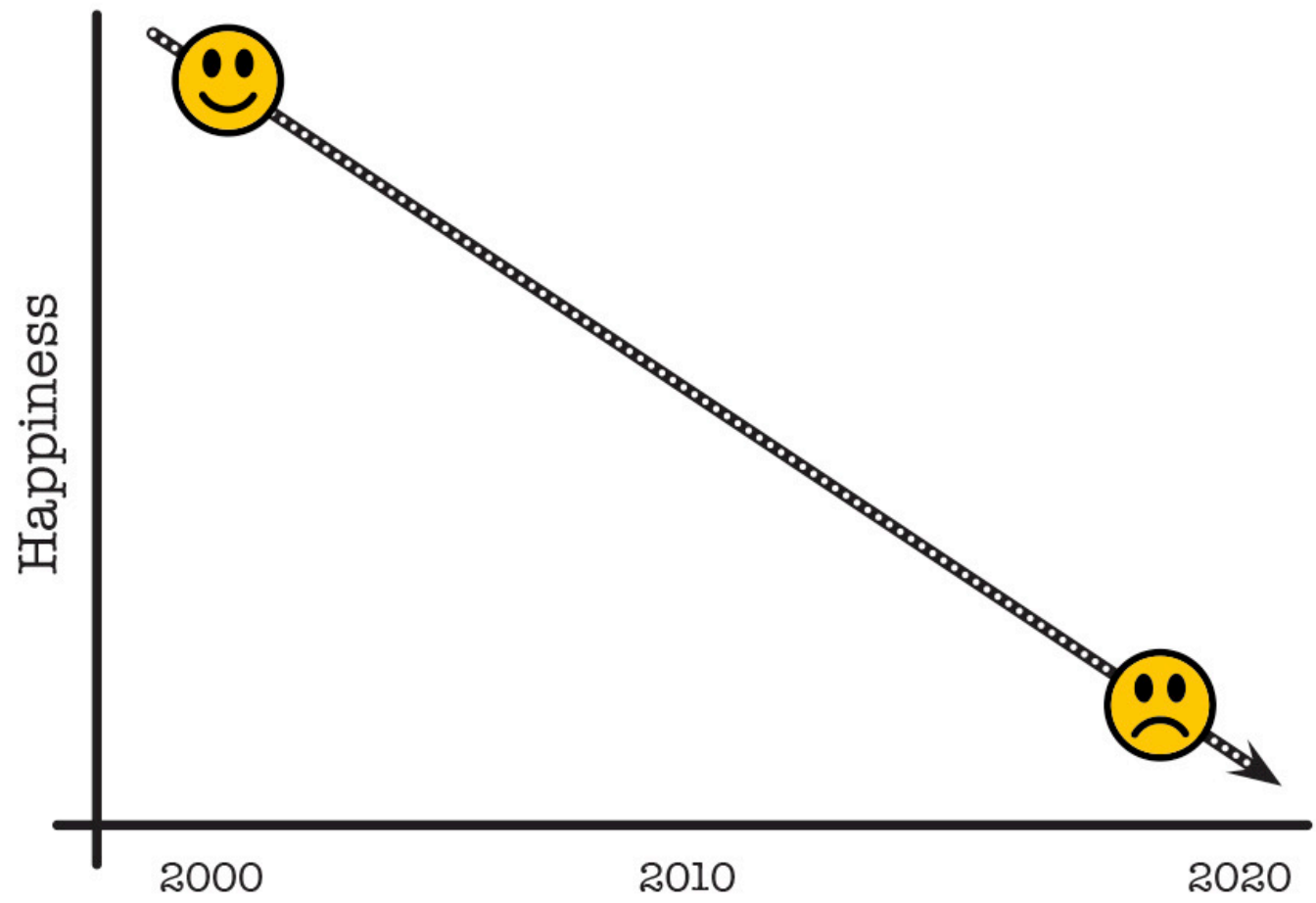
Paul M. Thompson, Ph.D. Laboratory of Neuro Imaging, UCLA,
NIMH/UCLA

The Plenty Paradox:

Overabundance is itself a stressor caused by the mismatch between our primitive wiring and the modern dopamine-rich ecosystem



WORLD HAPPINESS SURVEY



RICHER COUNTRIES HAVE HIGHER RATES OF ANXIETY AND DEPRESSION THAN POORER ONES

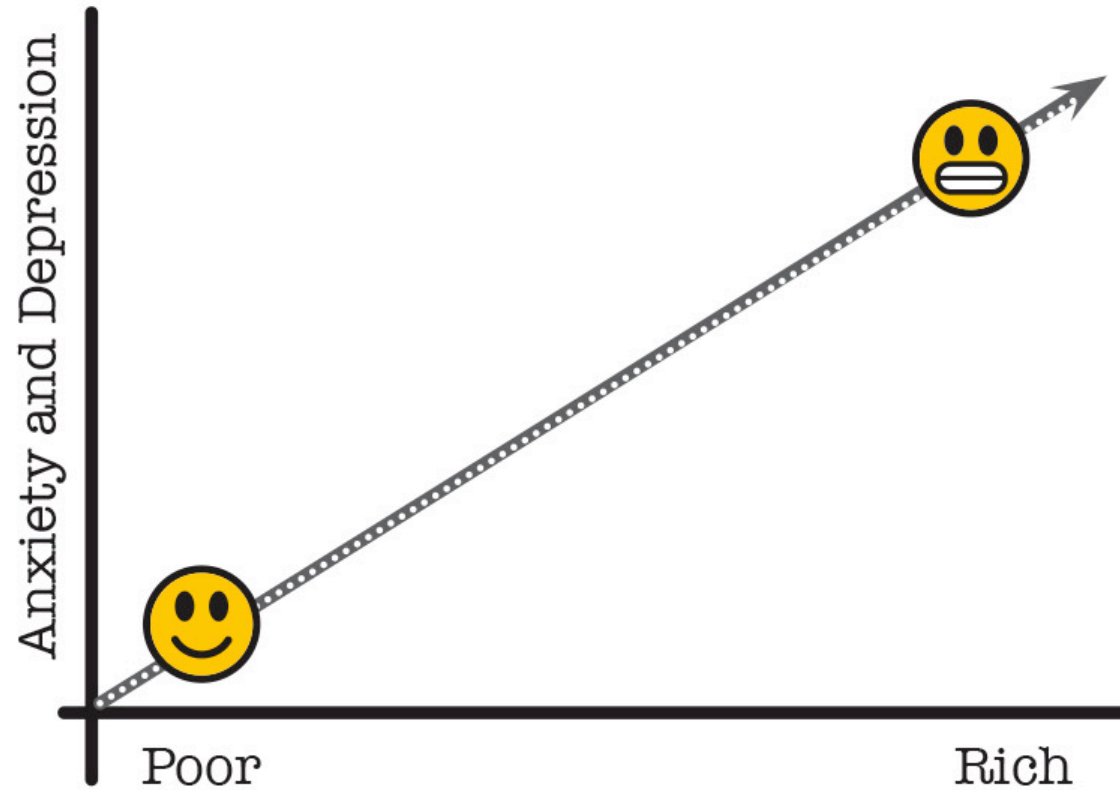
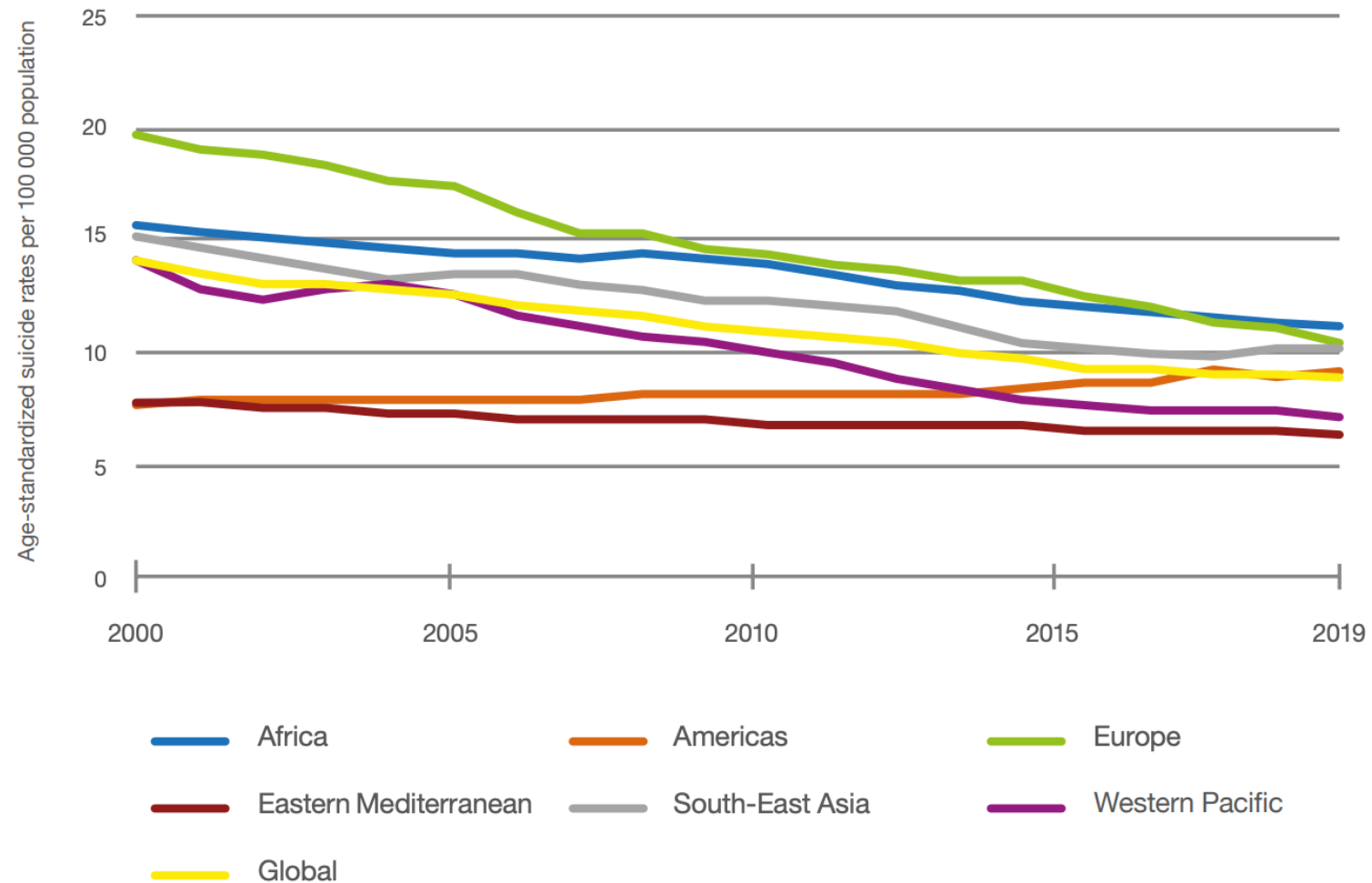
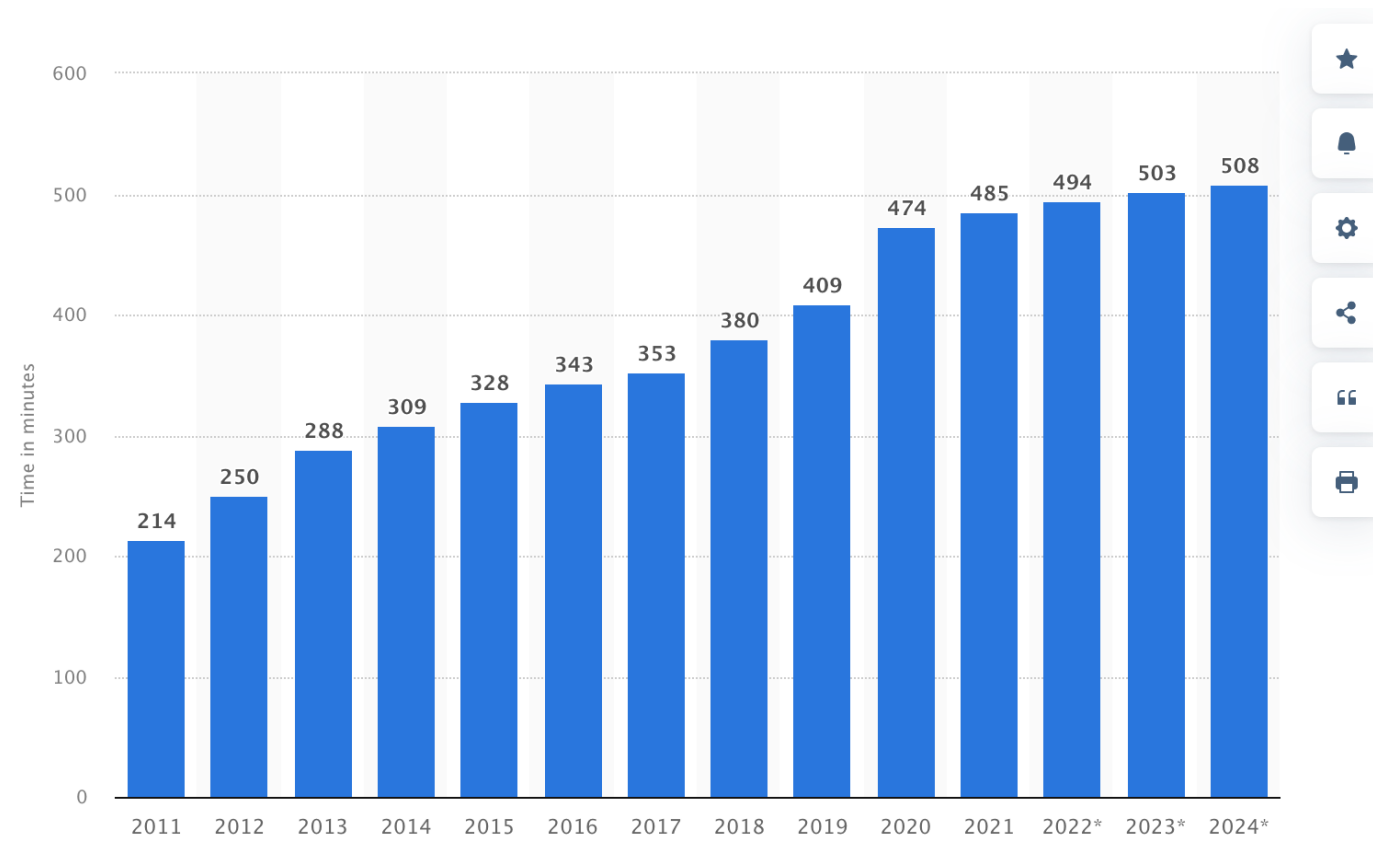


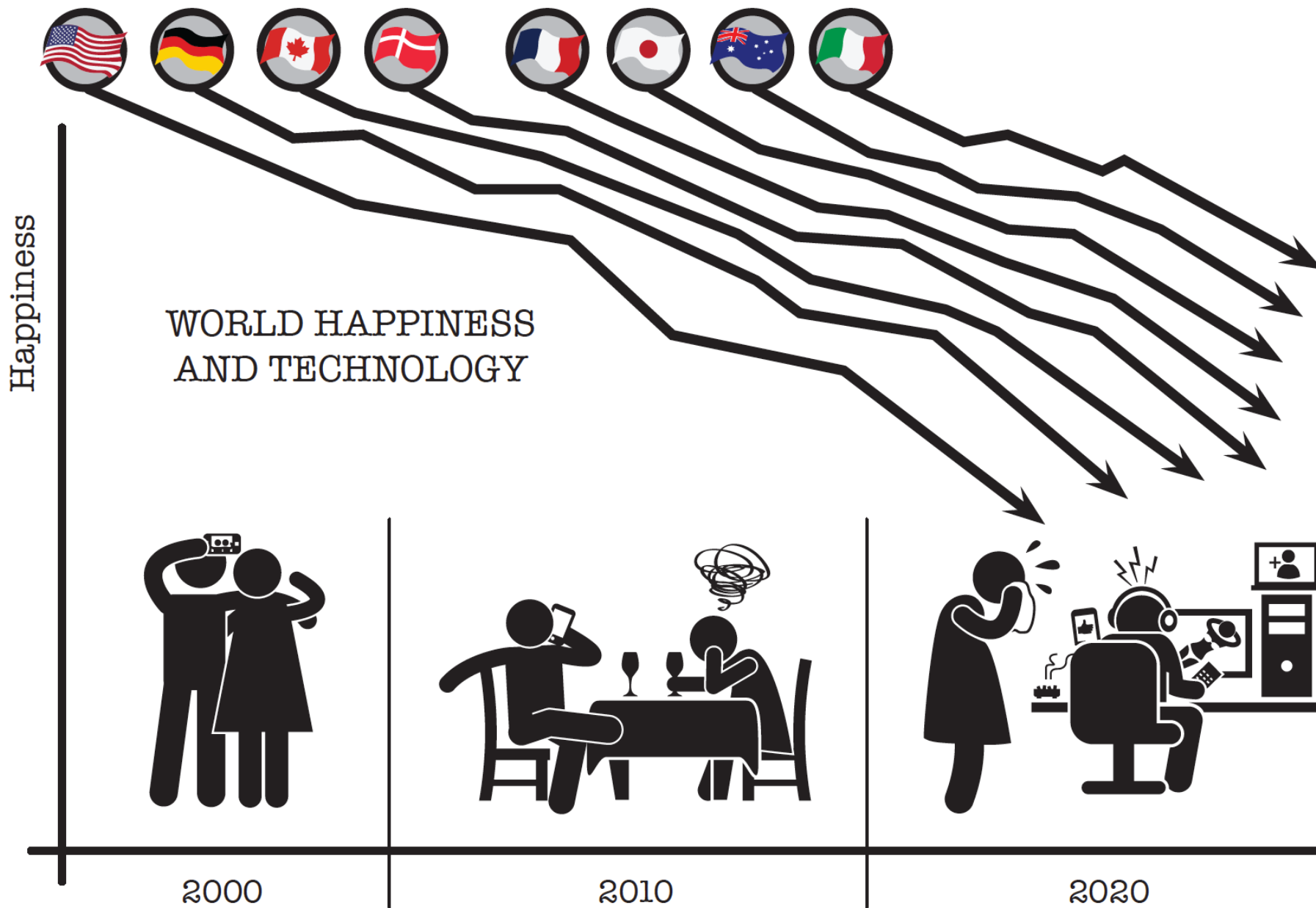
Figure 10. Age-standardized suicide rates (per 100 000 population) over time by WHO regions, both sexes



Source: WHO Global Health Estimates 2000-2019

In 2021, adults in the U.S. spent on average eight hours and five minutes with digital media each day.





What to Do About It

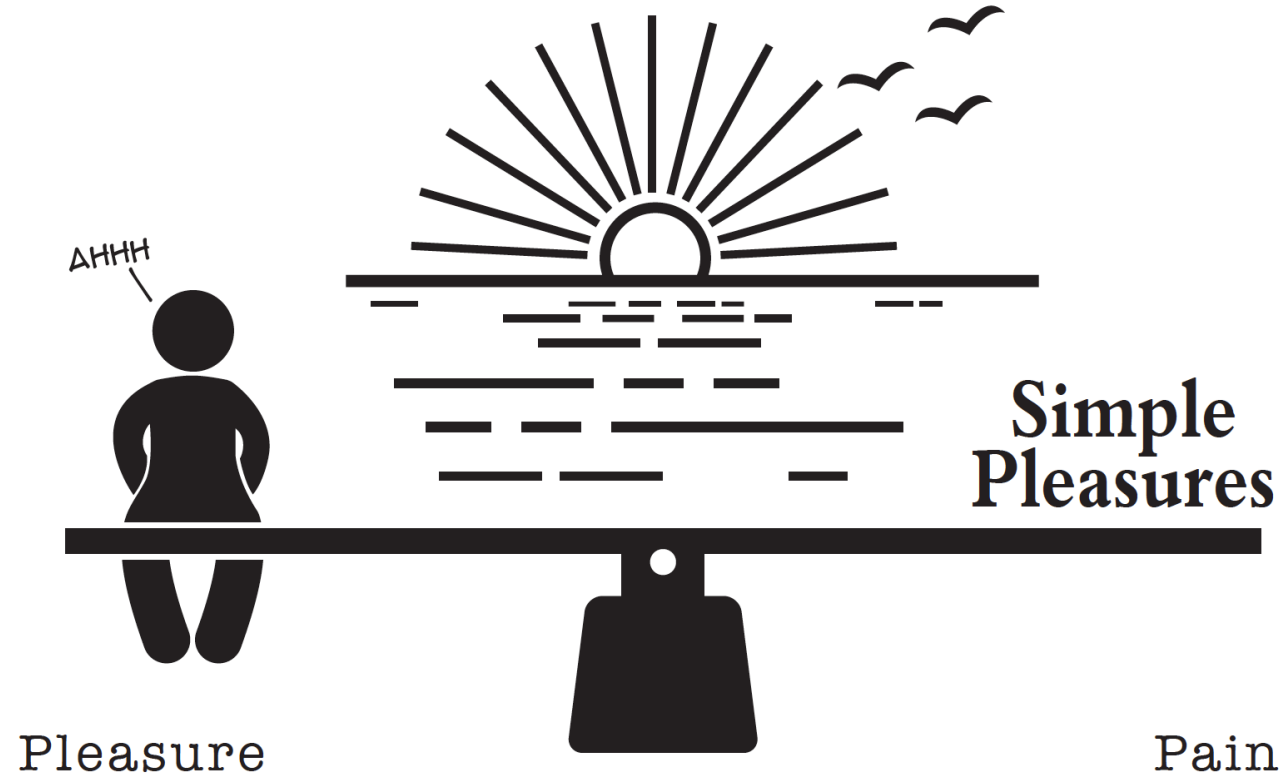
Three levels of intervention

- Individual/Family
- Community
- Legislature

Individual/Family

- Abstain
- Maintain
- Seek out pain

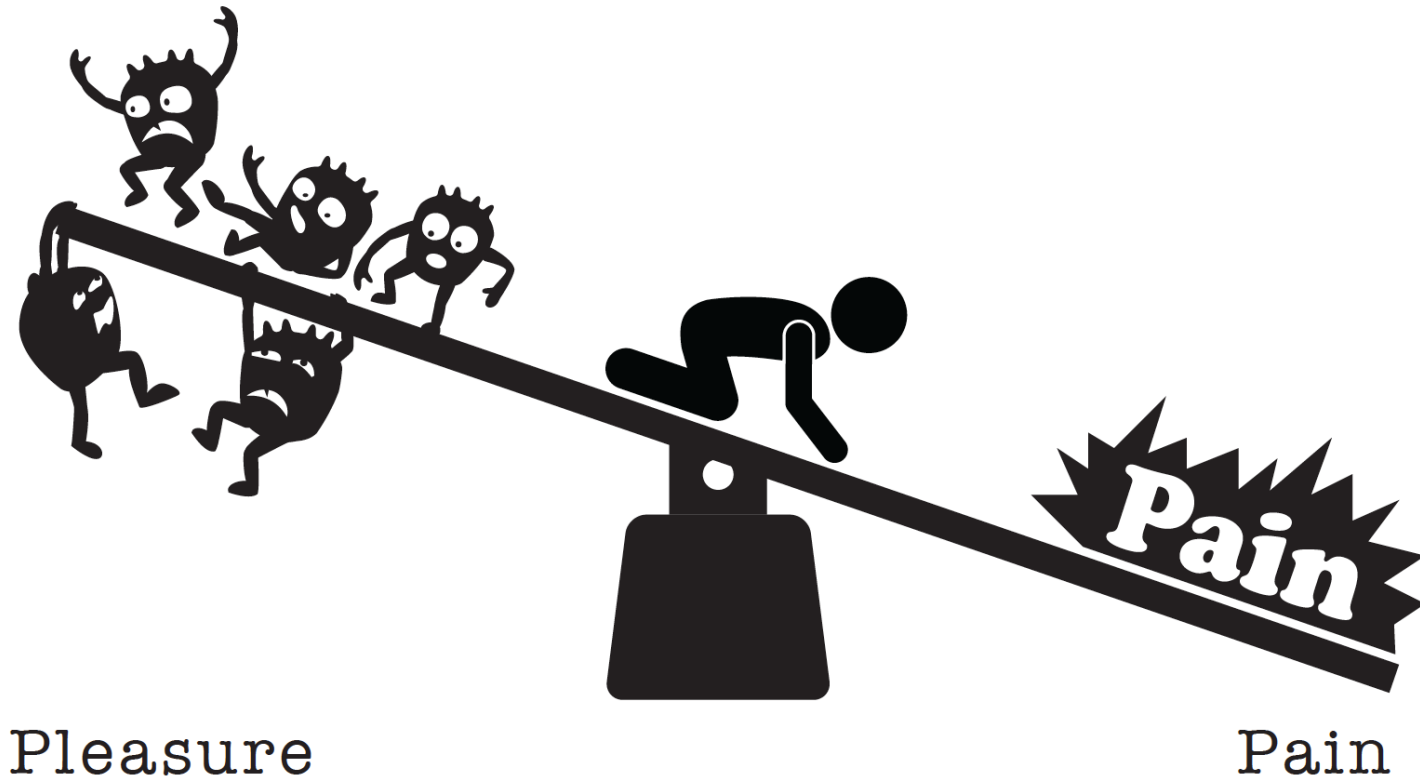
Abstain



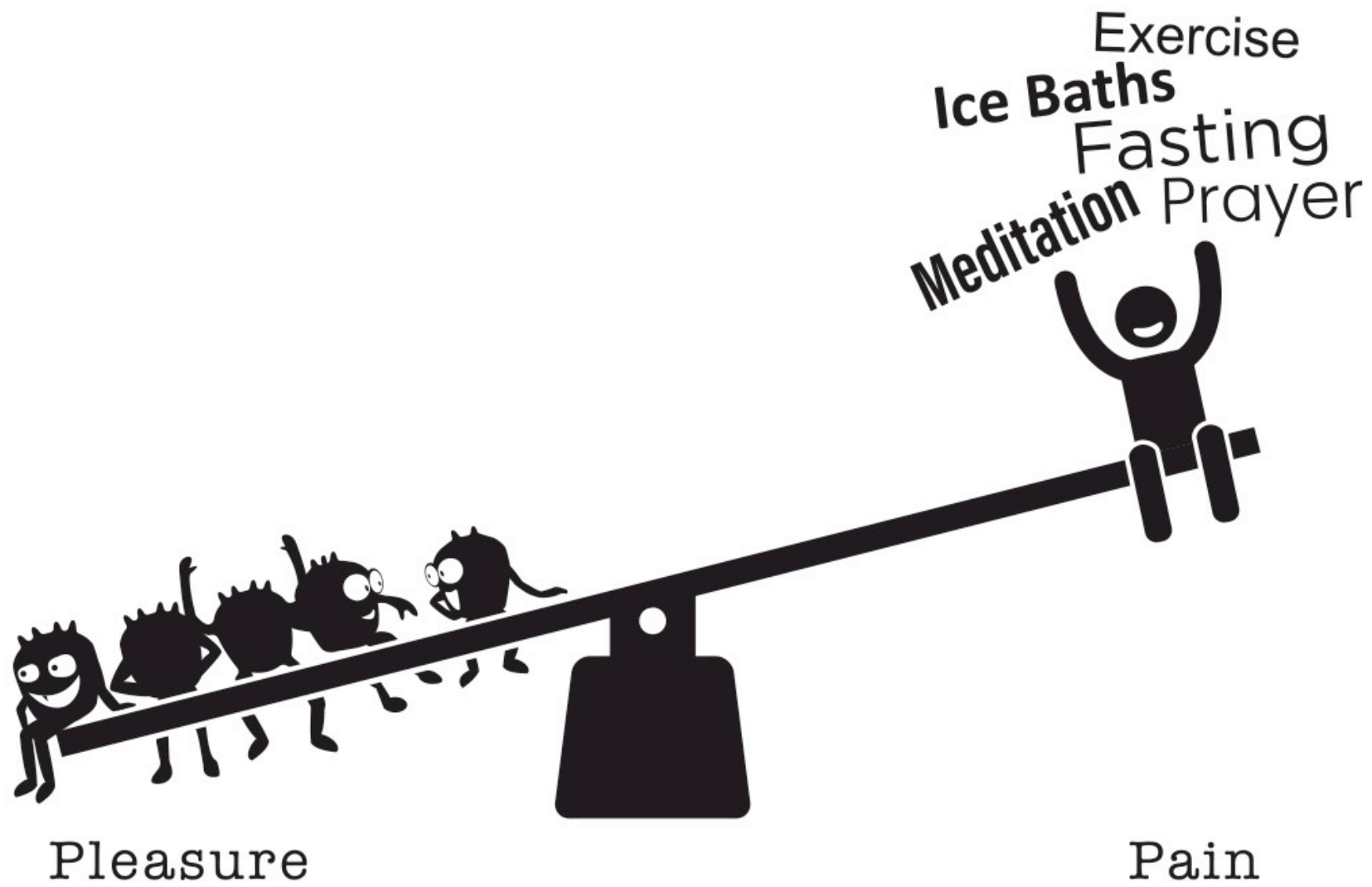
Maintain (Self-Binding)

- Space:
 - Delete apps
 - Physically separate from the phone (leave it at home)
 - Create tech free spaces (bedrooms)
- Time
 - Digital intermittent fasting (dopamine fasting)
 - Create tech free times (meals)
 - Schedule time for mindless scrolling?
- Meaning
 - Be intentional about how to use the device before going on the device
 - Assert neurological freedom: Hide the Like-button, turn off alerts and notifications, go grayscale
 - Values-Based Internet Use: No lying or hiding use (radical honesty) “Can I see your phone?”

Seek out pain? The science of hormesis



Lembke, Anna. *Dopamine Nation: Finding Balance in the Age of Indulgence*,
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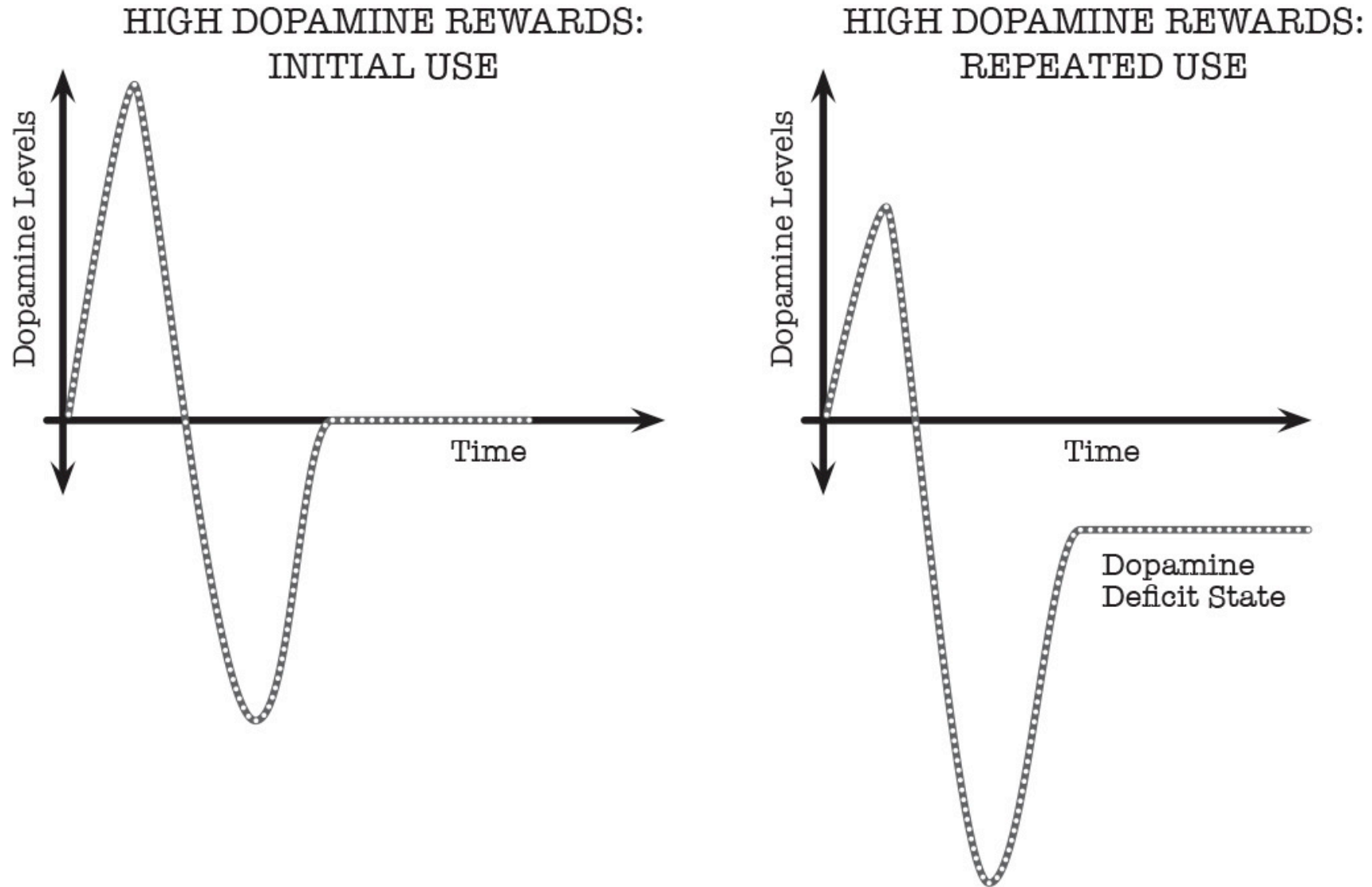
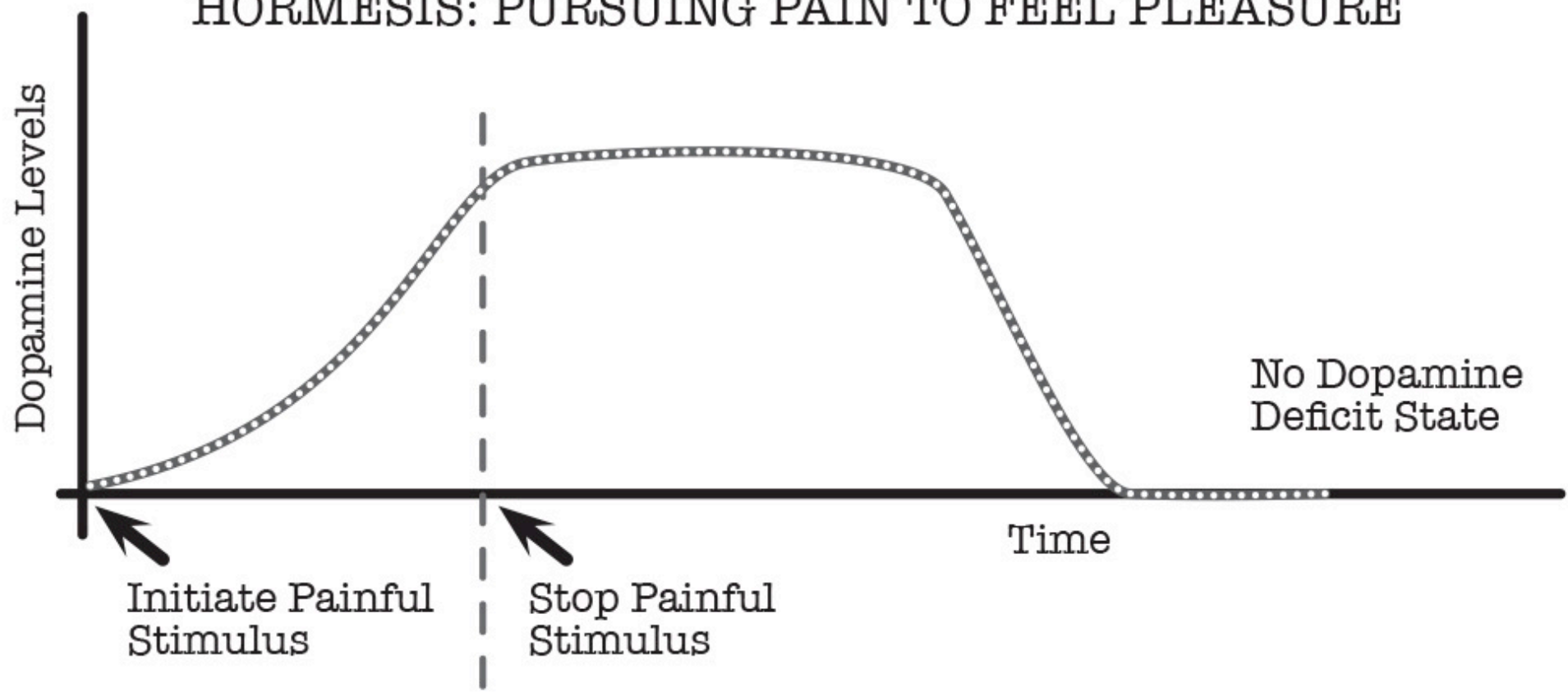


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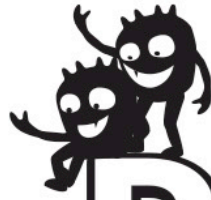
HORMESIS: PURSUING PAIN TO FEEL PLEASURE



Hormesis: Paying for our dopamine up front by unplugging and doing things that are hard

- Exercising
- Taking ice cold water plunges
- Intermittent fasting
- Praying
- Meditating
- Cooking (unplugged)
- Gardening (unplugged)
- Caring for pets (unplugged)
- Spending time with children (unplugged)
- Being in nature
- Making music/playing an instrument
- Reading a hard book
- Talking to the barista, shopkeeper, storekeeper instead of ordering with the App
- Walking or biking instead of driving
- Writing a thank-you note
- Reaching out to old friends, parents, grandparents
- Telling the truth
- Saying we're sorry

Dealing with boredom!!!



D = Data

O = Objectives

P = Problems



A = Abstinence and Asceticism



M = Mindfulness



I = Insight

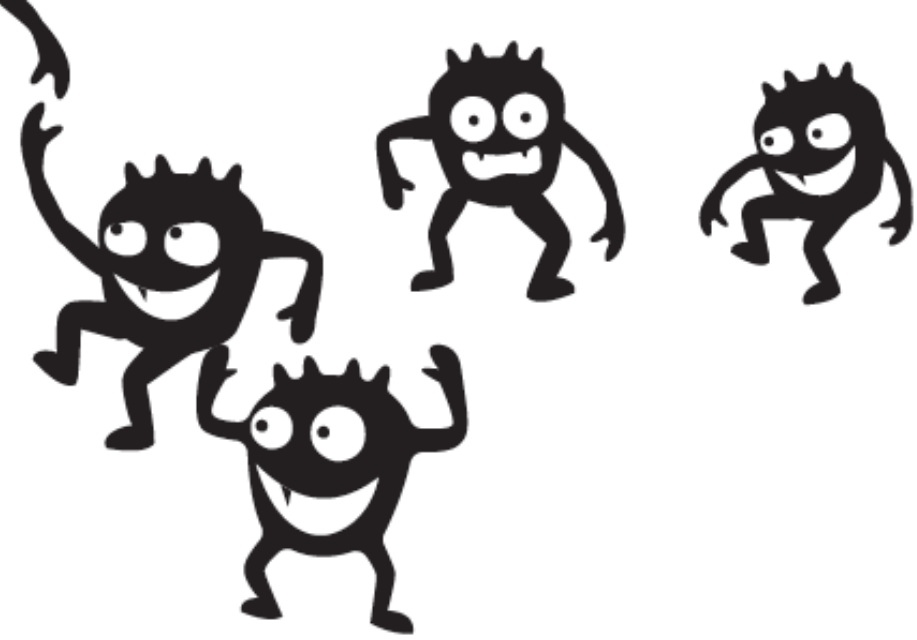


N = Next steps



E = Experiment




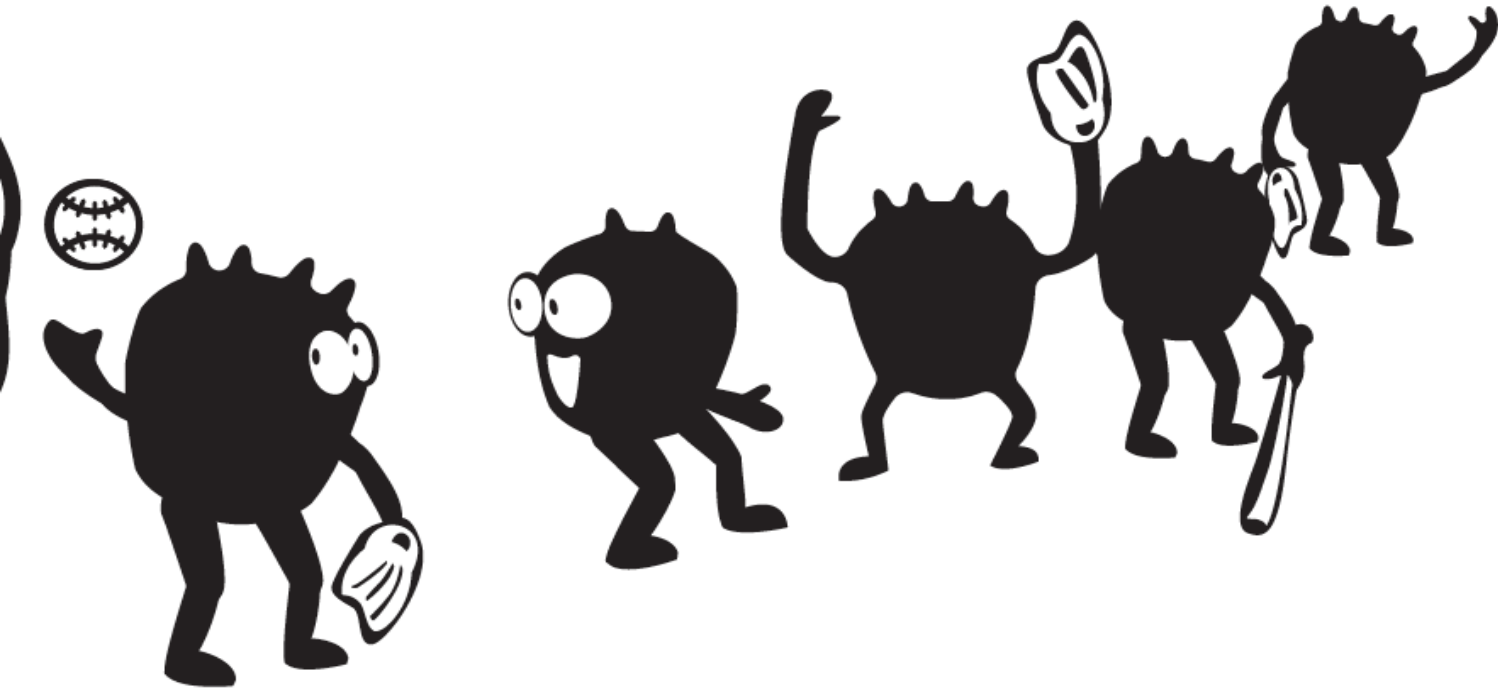


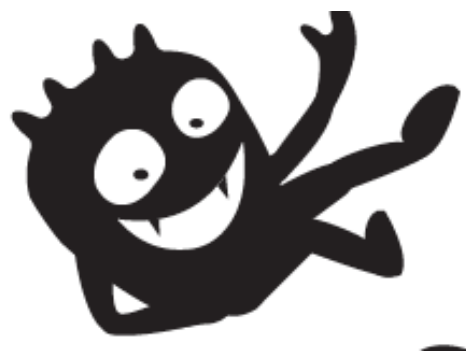
⊙ = Objectives

P = Problems



 = Abstinence



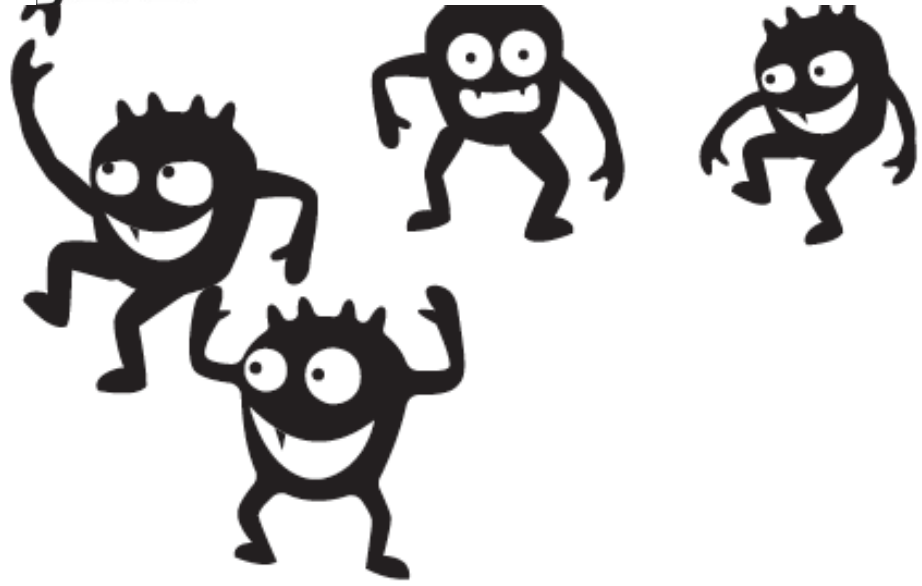


 **M** = Mindfulness

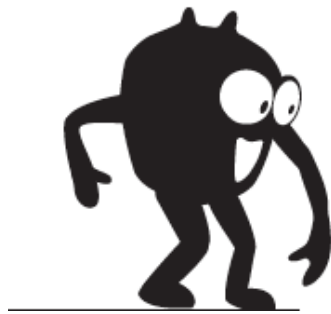
 = Insight



N = Next steps



 = Experiment



ReSet Your Tech Life

- **1 Go on a digital fast** Don't touch your phone – or any screens – for 24 hours. The aim is to interrupt your physiology and reset dopamine reward pathways. In truth, 24 hours is probably not enough, but it may make you realize how addicted you are.
- **2 Optimize your chance of success** by setting a date and time for going cold turkey. Tell people you'll be out of contact and make plans for what you'll do in this time. Trust me: it will feel very long. Time slows when we stop chasing dopamine.
- **3 Anticipate the symptoms of withdrawal:** anxiety, irritability, insomnia, dysphoria, craving. Just know these are time limited and with continued abstinence will lessen or go away entirely.
- **4 When you get intense cravings** to check your phone, take a cold bath, do 20 sit-ups or clean the closet. In other words, rather than switch addictions to something else that makes you feel good, invite pain as a way to reset the balance.
- **5 When the fast is over,** plan how to reintegrate digital devices without letting them take over your life. Write down the ways your fast made you feel better and keep it with you; before even opening your device again, make a list of what you plan to do and set a time limit; use strategies such as turning off alerts and deleting apps.

Community/Legislature

- Access (least difficult)
- Design
- Content (most difficult)

Access



By [Julie Jargon](#) [Follow](#) | Photographs by Bea Oyster for *The Wall Street Journal*
Nov. 5, 2022 9:00 am ET

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A boarding school is conducting a social experiment: a smartphone ban for all students and faculty.

Buxton School, a 57-student high school in Williamstown, in northwest Massachusetts, had always prided itself on its close-knit community, where family-style meals are eaten at round tables and students and teachers share in chores. But as smartphones became ubiquitous, faculty members say that sense of community eroded.

Students often looked down at screens during meals and even in class, where phones were prohibited. Teachers grew tired of being gadget police. Kids retreated to their rooms after class to scroll and text rather than gathering in student lounges. When the Covid-19 pandemic hit in 2020 and the school closed for a few months, class went virtual and things got worse.

NEWSLETTER SIGN-UP

Family + Tech

Columnist Julie Jargon, a mother of three, helps families find answers and address concerns about the ways technology is impacting their lives.

Preview

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Access

- The Chinese government limiting access of children to videogames:
 - Uses facial recognition software to verify
 - Holds the companies that make and profit from the games responsible
 - Probably only possible in an authoritarian government
 - But consider our drinking and cigarette laws
- State of Louisiana limiting access of children to pornography websites:
 - Site visitors required to verify they're over 18 before accessing Pornhub and other pornographic sites
 - Uses digital ID service to verify. Doesn't identify who you are.

Design

- Stop promoted content
 - The AI algorithms learn what we've liked before and then send more potent, novel versions of the same
 - Leads to extreme content, usually negative
 - Leads to polarizing communities
- Stop the streaks and ranks and other quantitative comparisons that drive overuse
- Make it easier for users to opt-out, de-subscribe, de-finance, etc
- Make it easier for parents to monitor use
- Require companies to share their user data and be responsible for harmful use (California SB 680)

Thanks for listening
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