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Neurobiology of Gambling Disorder, Risk Factors, Developmental Issues and Treatment Approaches from Pharmacotherapy to Mindfulness Based Interventions

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Agenda

Morning	
8:30	Welcome and Introductions (How is Your Brain)
9:00	Biopsysoc/spirt Perspective Epigenetics and Genetics Neurotransmitters and brain
10:00	Gambling and Brain Psychoed
10:30	Break (10 min)
10:40	Gambling and Brain, Cont. Risk Factors and Exec function
Noon	Lunch (60 min)

Afternoon	
1:00	Developmental Issues Pharmacotherapy
2:00	Break (10 min)
2:10	Counseling and the Brain Mindfulness and Self-Compassion Based Approaches
3:15	Review, Q&A, Evaluations
3:30	Adjourn

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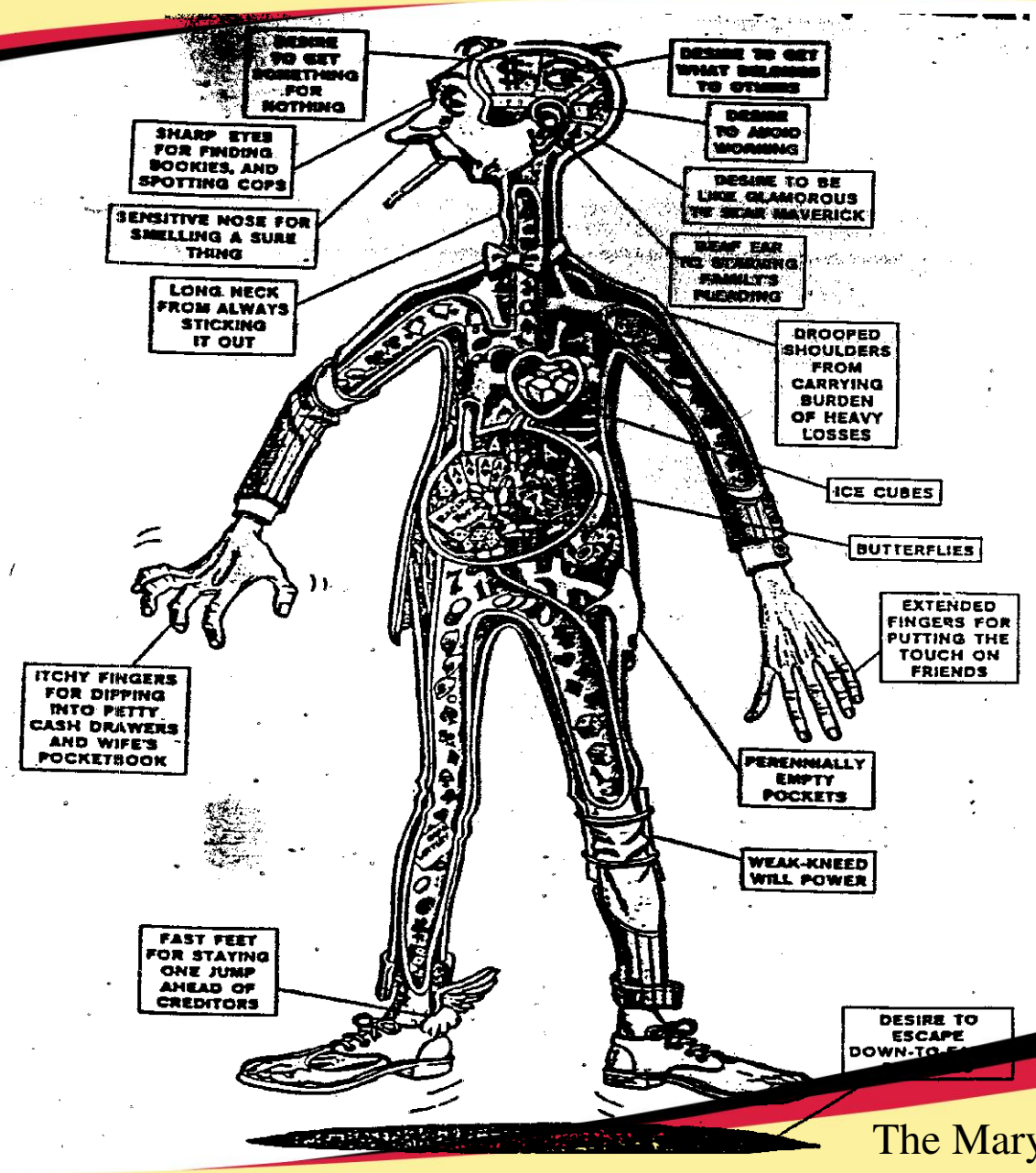
1984 Version of Biology of Problem Gambling



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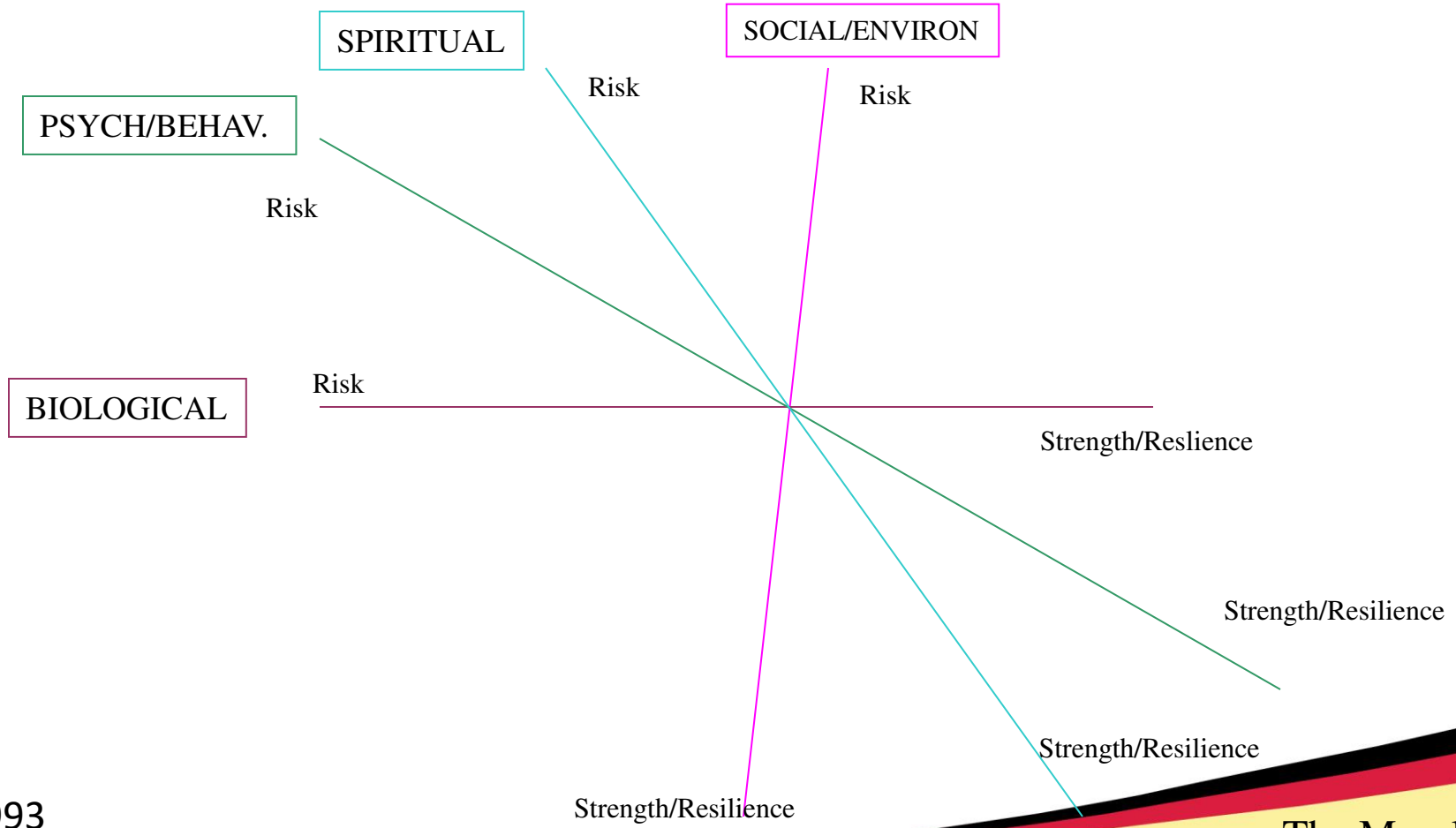
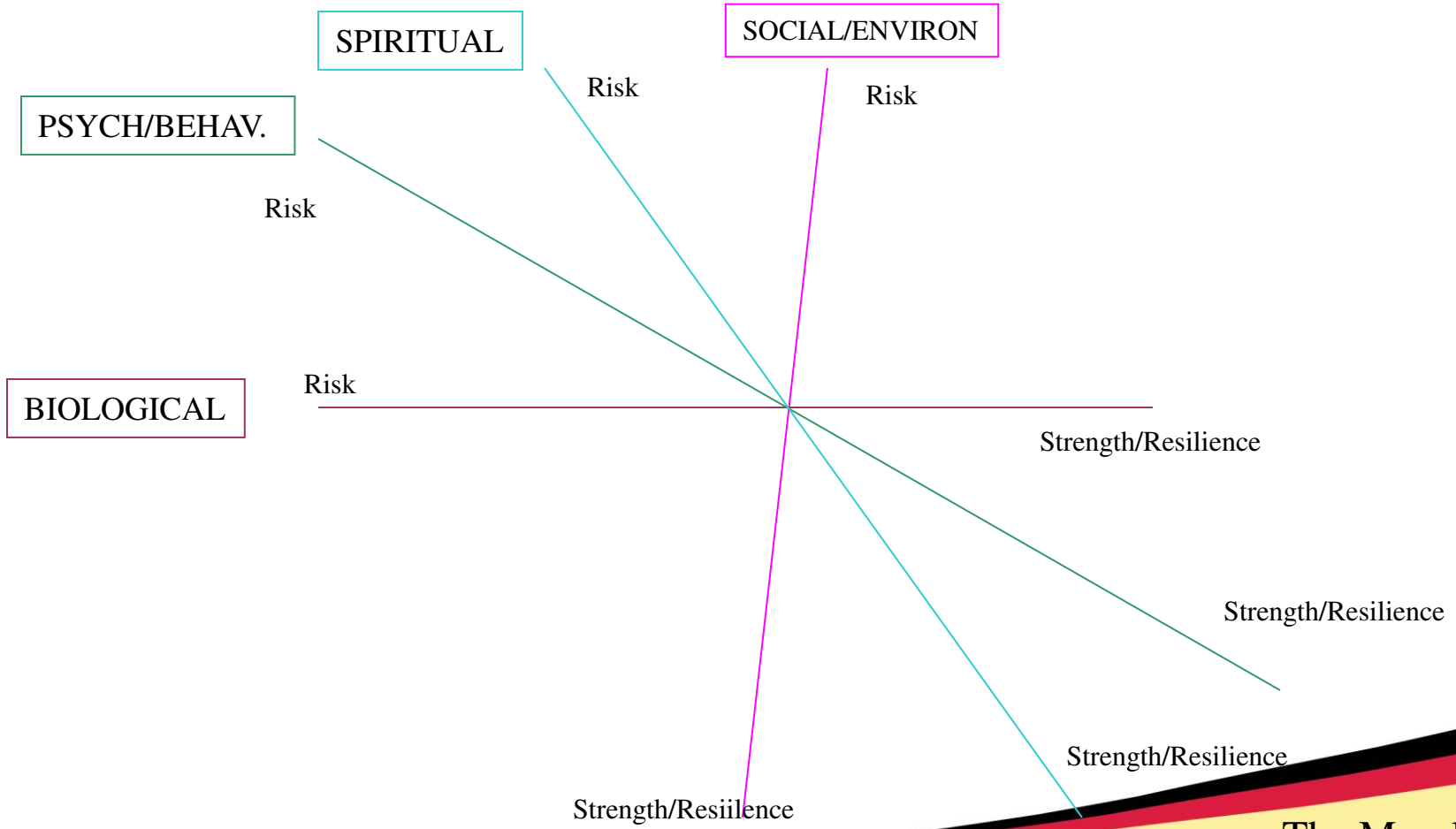
Biopsychosocial/spiritual Risk Factors Model for Substance Use and Gambling Disorders



Rugle, 1993

Where Do You Fall?



Genetics of Gambling Disorder

- GENETIC ANALYSIS
- Polygenetic model: multiple genetic variants contribute to risk for gambling disorder
- Not one problem gambling gene
- TWIN STUDIES
- Establish genetic contribution for risk for gambling disorder vs. environmental risk
- FAMILY HISTORY
- Those with family history of problem gambling and/or substance use disorders at higher risk for gambling disorder

Genetic Risk Factors: Twin Studies

- **Slutske, et al., 2000**
  - **Problem and Pathological gambling have many, if not all, same risk factors in common**
  - **Problem gambling differs from Pathological Gambling in requiring fewer, not different risk factors**
  - **Relationship between problem and pathological gambling similar to that of substance abuse and dependence**
  - **12 – 20% of genetic risk for PG in common with genetic risk for Alcohol dependence (less than nicotine and about same as marijuana)**

Genetics

- Slutske, et al, 2010
  - Establishes “genes are as important in the etiology of disordered gambling in women as men.”
  - No evidence for quantitative or qualitative gender differences of variation in disordered gambling liability.

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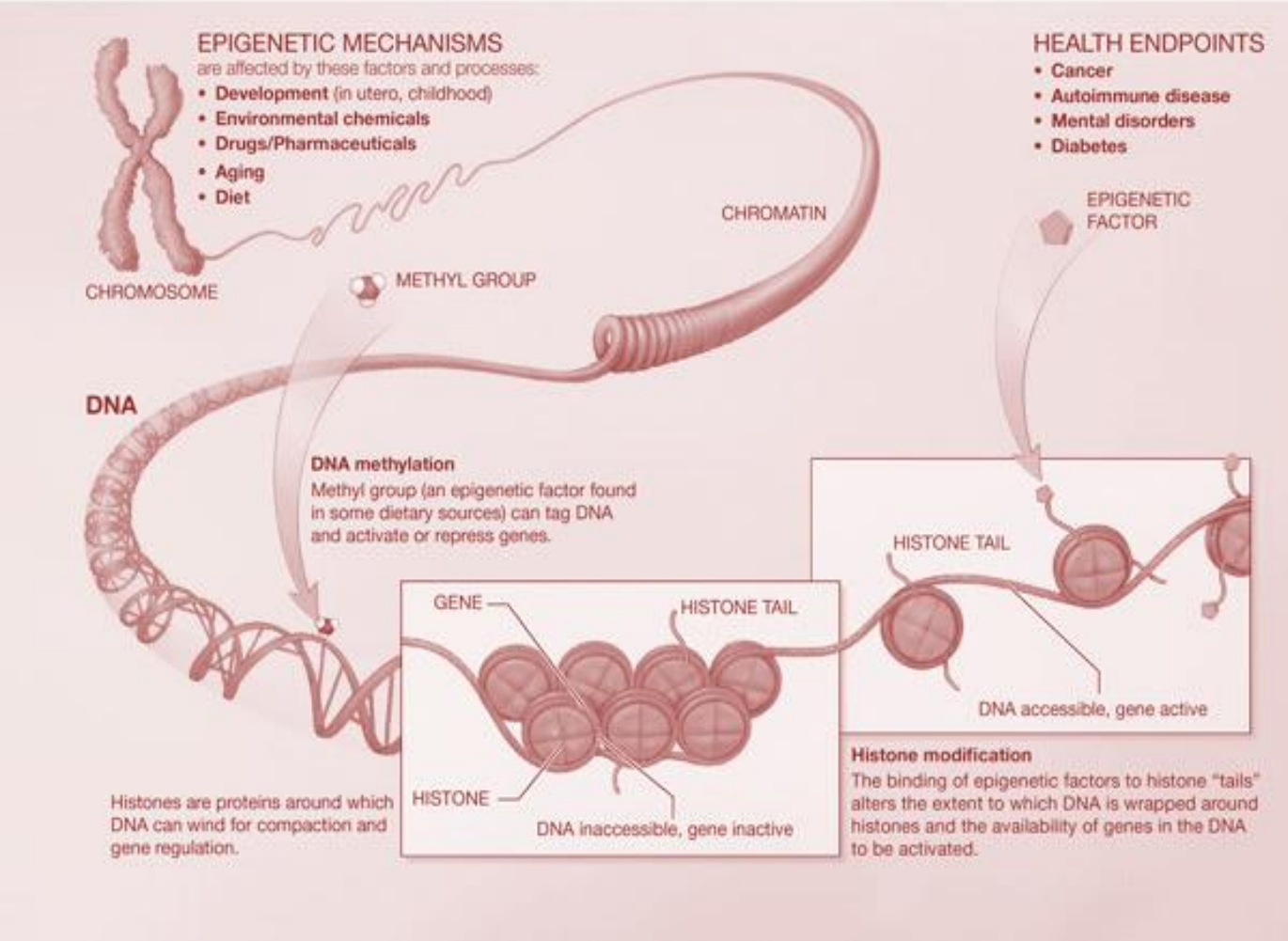
Epigenetics



- Science of gene expression
- Chemical compounds (i.e., methyl groups) on or attached to DNA
- Can be environmentally influenced by things like diet, pollutants, and trauma
- Research has established that trauma response can be inherited through generations contributing to depression, anxiety, addiction as well as physical disorders such as heart disease, obesity, and cancer

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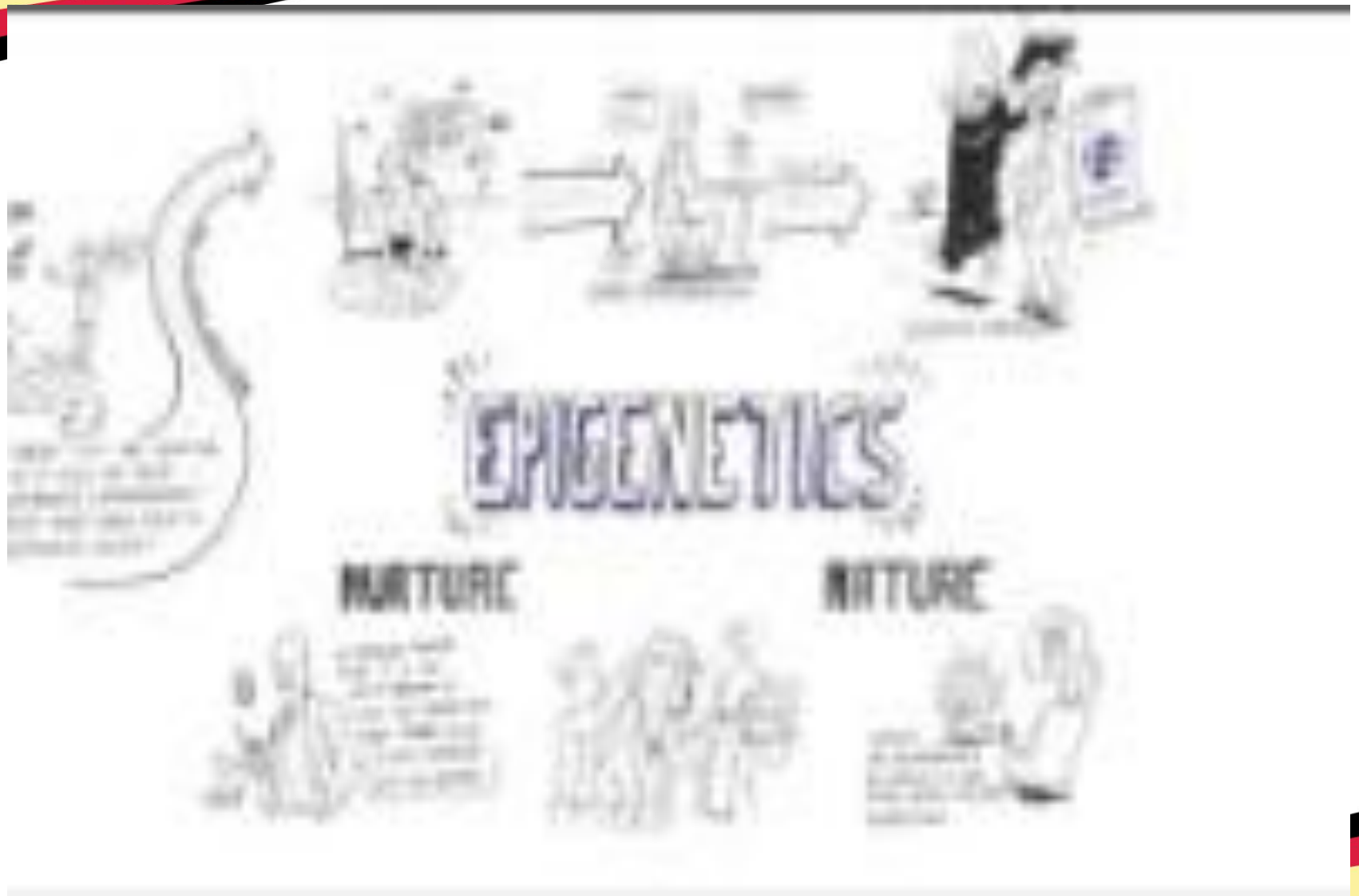
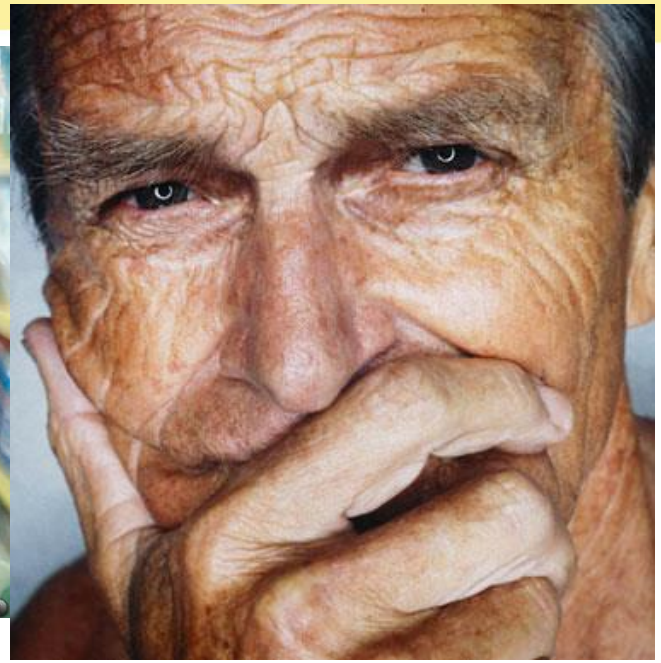

EPIGENETICS
NATURE
NATURE



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Dimensions of Harm

Langham, Thorne, Browne, Donaldson, & Rockloff, 2015

Financial Harm

Relationship destruction, conflict

Emotional / Psychological Distress

Decline in Health

Cultural Harm

Reduced work performance

Criminal Activity

Generational Harms

Crisis

Legacy

life course and intergenerational harm

Gambling: Effects on the Brain

Serves as an escape from issues, problems, grief, trauma, depression and anxiety.

Produces a trance-like state of awareness

Loss of time and spatial awareness

Shared Risk Factors

(CDC, 2013)

Ecological Level:	Shared Risk Factors: *Mental Health, Substance Abuse, & Gambling*
Society	• Residential instability • Low income, poverty
Community	• Living in high stress neighborhoods
Relationship	• Experience childhood trauma • Intimate partner violence
Individual	• Initiation of behavior at early age • Serious illness, chronic medical condition • Active duty or retired military

https://health.gov/healthypeople/priority-areas/social-determinants-health

Social Determinants of Health (SDOH)

SDOH are the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.

SDOH also contribute to wide health disparities and inequities. For example, people who don't have access to grocery stores with healthy foods are less likely to have good nutrition.

Examples of SDOH include:

- Safe housing, transportation, and neighborhoods
- Racism, discrimination, and violence
- Education, job opportunities, and income
- Access to nutritious foods and physical activity opportunities
- Polluted air and water
- Language and literacy skills

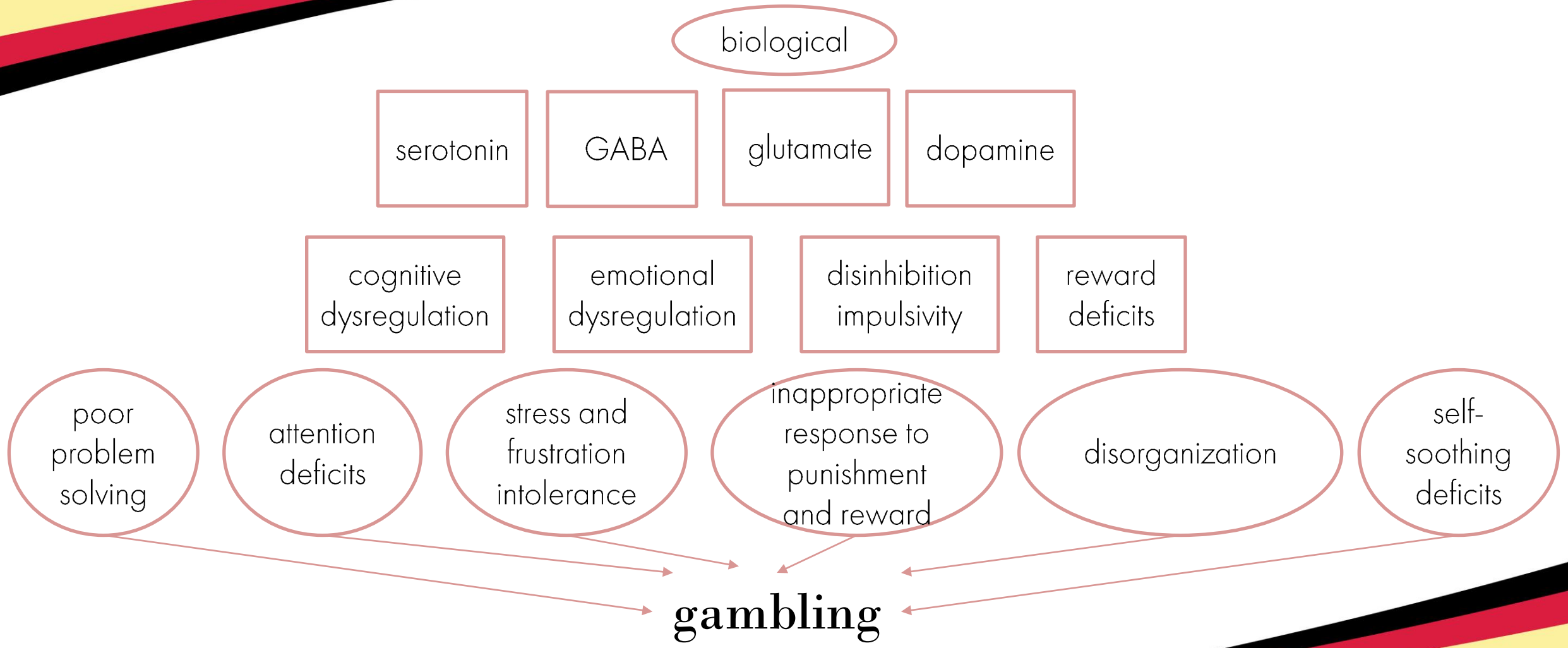
How does Gambling Impact upon the Social Determinants of Health and Vice Versa?

- Education Access and Quality
- Health Care Access and Quality
- Neighborhood and Built Environment
- Social and Community Context
- Economic Stability

Incorporate gambling questions in screening for SDOH.

Genetics and Environment

- Slutske et al, 2015
  - A small portion of the genetic risk to gamble was explained by moving to or remaining in a disadvantaged area
  - The genetic risk associated with gambling involvement and disordered gambling is associated with greater sensitivity to the effects of being exposed to living in a disadvantaged area
  - The relationship between local area disadvantage and gambling involvement and disorder was stronger in regions where there was a greater density of gambling venues (availability of EGMs)

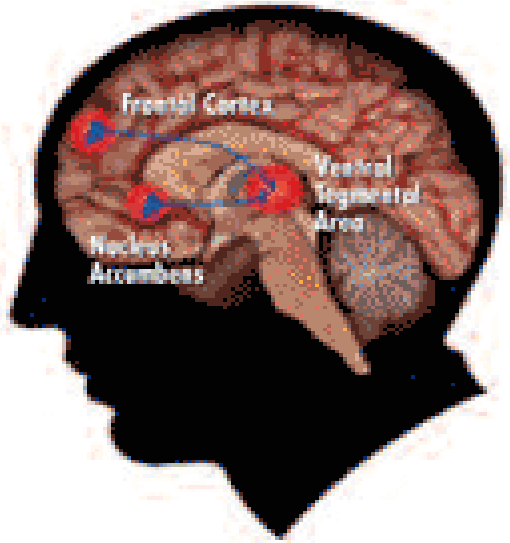

biological
serotonin
GABA
glutamate
dopamine
cognitive dysregulation
emotional dysregulation
disinhibition impulsivity
reward deficits
poor problem solving
attention deficits
stress and frustration intolerance
inappropriate response to punishment and reward
disorganization
self-soothing deficits
gambling
Solution to all problems. Intensity focuses attention (acts as stimulant). Relieves stress.
Focus on intermittent rewards. Becomes organizing principle. Acts as mood modifier.

Genetics and Neurotransmitters

- Reward Deficiency Syndrome
  - Complex interaction of neurotransmitters leading to feelings of well being, satisfaction
  - Disruption of system results in negative emotions: anxiety, anger, cravings
  - Interacts with learning, memory and habit formation
  - Neurotransmitter systems:
    - Dopamine (Pleasure)
    - Serotonin (Impulsivity)
    - Endorphins (Euphoria, pain relief)
    - GABA (Inhibitory system, anxiety relief)
    - Norepinephrine (Energy, alertness)

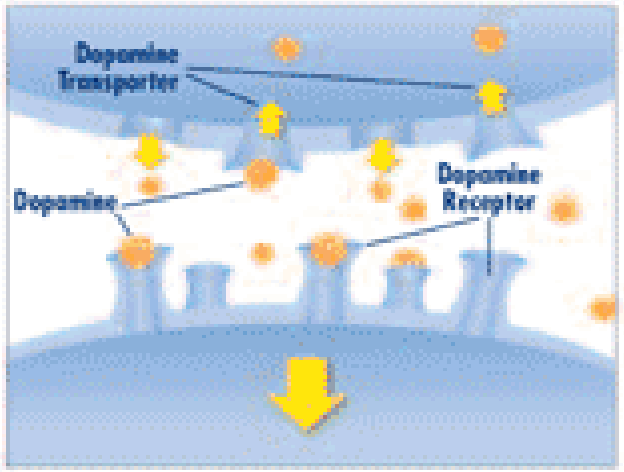
ALL DRUGS OF ABUSE TARGET THE BRAIN'S PLEASURE CENTER

Brain reward (dopamine) pathways

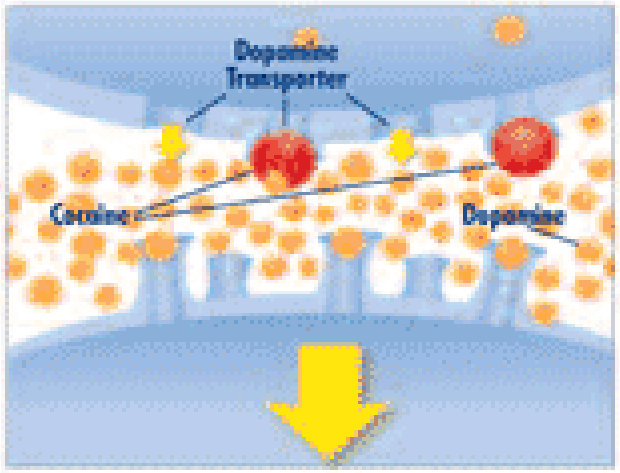


These brain circuits are important for natural rewards such as food, music, and art.

All drugs of abuse increase dopamine



FOOD



COCAINE

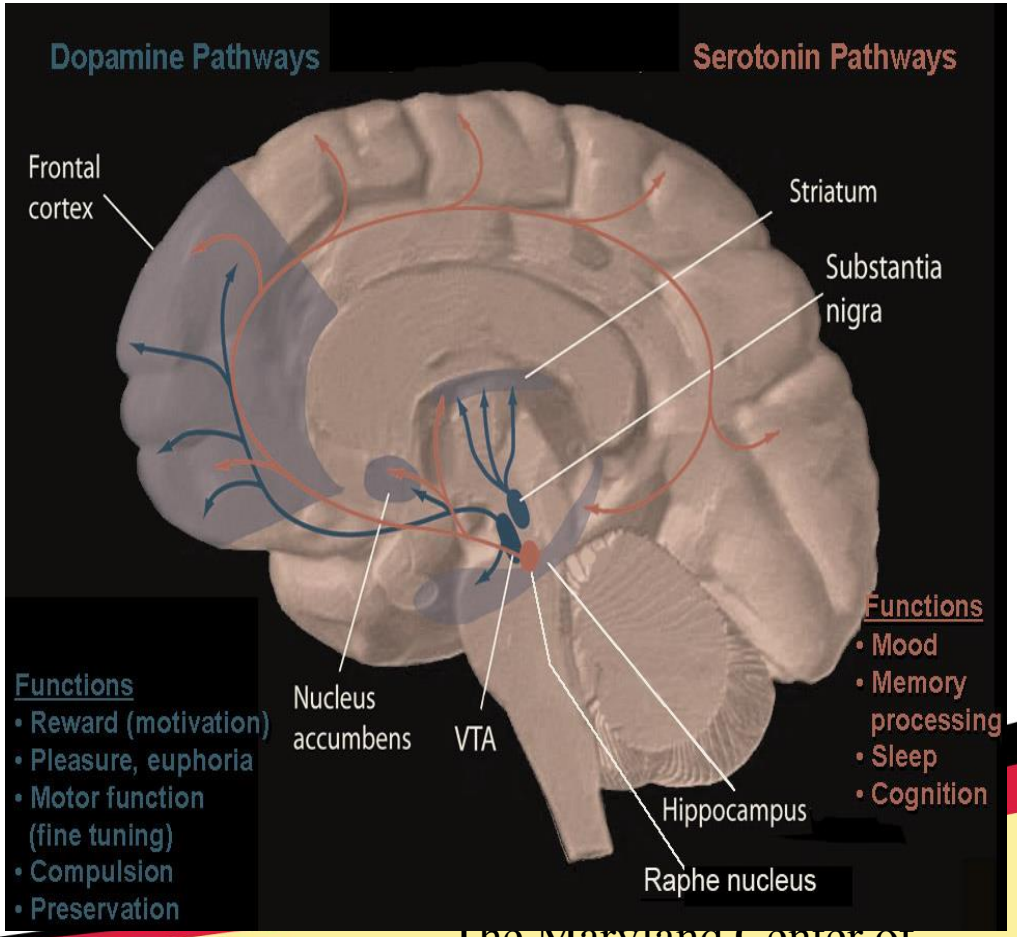
Typically, dopamine increases in response to natural rewards such as food. When cocaine is taken, dopamine increases are exaggerated, and communication is altered.

Roles for Neurotransmitters

Neurtransmitter	Role
Dopamine and Glutamate	Reward, Reinforcement
Serotonin	Behavior Initiation/Cessation, emotion regulation
Norepinephrine	Arousal, Excitement, Alertness
Opioids	Pleasure, Urges
GABA	Inhibitory, Calming, Relaxing

Neurotransmitters and SUD

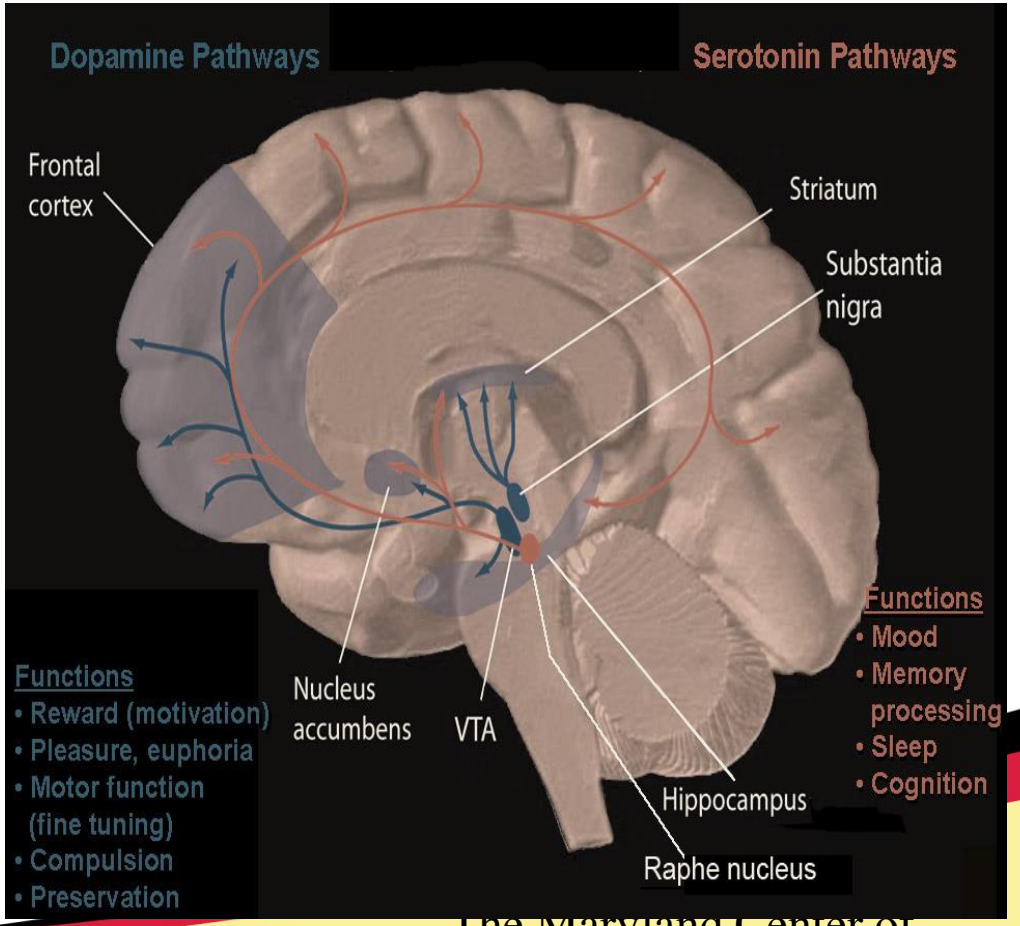
- Dopamine release from VTA well established in SUD
- Glutamate regulated DA release in Nac
- Opioids
  - Enhance DA neurotransmission by stimulating firing of VTA DA neurons that project to NAc and block local inhibitory GABA neurons
- Alcohol
  - Mechanism not as well understood. Evidence that increases activity of VTA DA neurons leading to large release of DA in NAc
- Cocaine
  - Increase DA in striatum via inhibiting DA reuptake. Also increase VTA DA neuron firing. Larger transient DA release in Nac in response to cocaine



Neurotransmitters and Addiction

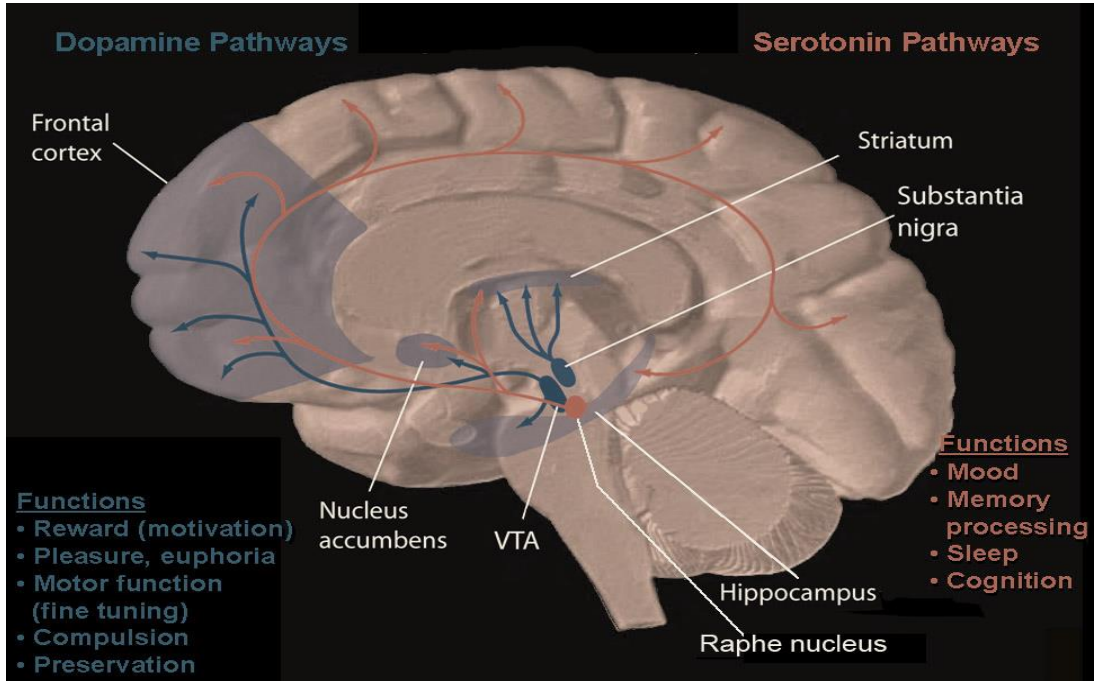
Dopaminergic neurons built to fire rapidly and over prolonged period. Well suited to potentiate drugs effects

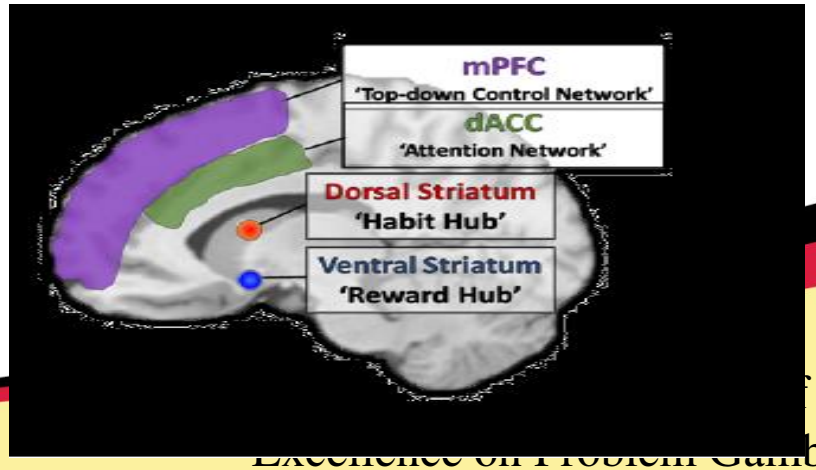
Glutamate co-release enables DA neurons to meet demands of high frequency burst firing and sustain DA release over time during exposure to drugs (activities) of abuse – enabling reinforcing properties



Brain Regions Functions

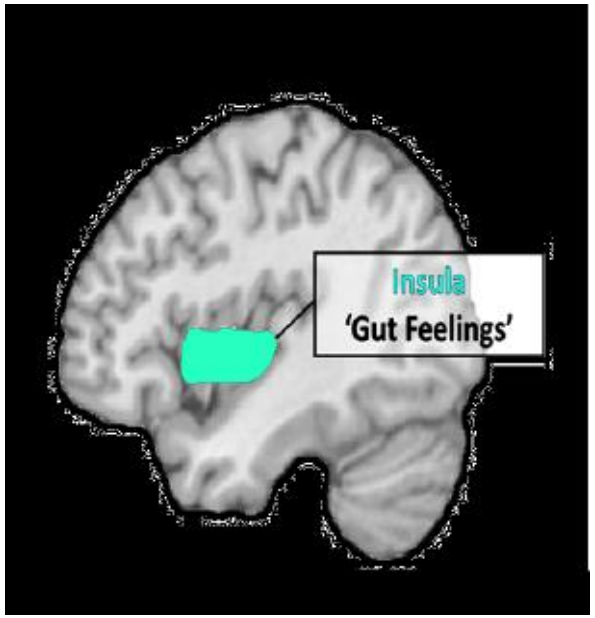
- Ventral Tegmental Area (VTA) –Regulates reward consumption, learning, memory and addictive behaviors through mediating DA release to downstream areas
- Nucleus Accumbens (NAc) – Neural interface between motivation and action
- ACC especially important when effort needed to carry out a task
- dACC – (cognition) Connected to the PFC and motor system making it the central station for top down and bottom up stimuli and control. Detection and appraisal of social processes. Error detection
- vACC – (emotion) connected to amygdala, Nac, Hippocampus, Hypothalamus and Insula. Assesses importance of emotional and motivational information
- Lead exposure – smaller ACC ; also in ADHD, OCD, Depression and Anxiety





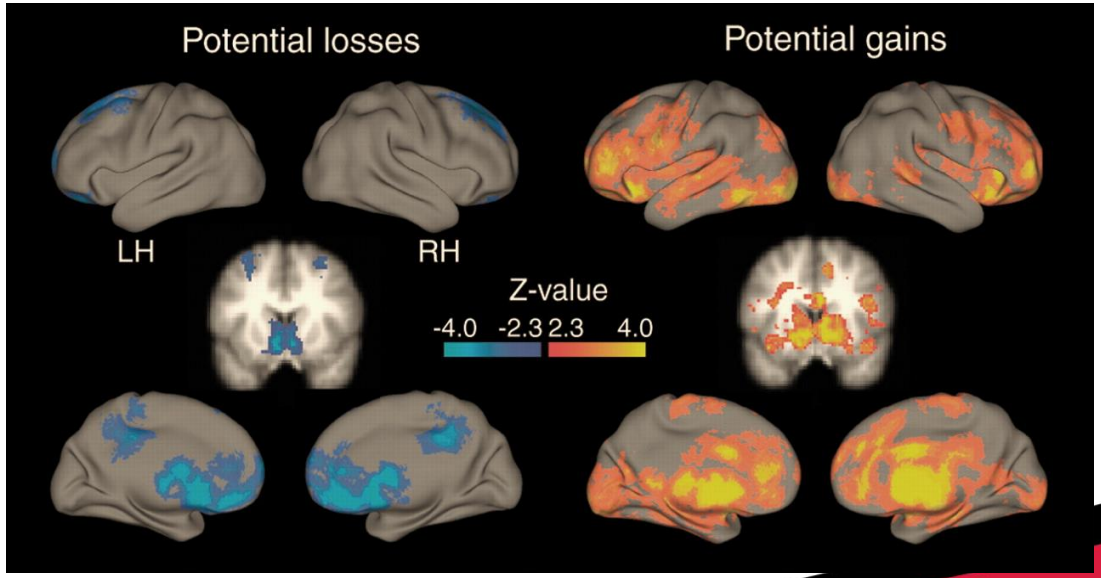
Role of Insula

- Insula activated during urges to engage in addiction
- Dysfunction of insula underlies unhelpful decision making leading to continued addictive behavior
- Has role in conscious feelings of urges
- Encodes internal sensations of addiction elicited by cues and rituals
- Hyperactive insula in those with gambling disorder
- Treatments designed to reduce this hyperactivity via drugs or mindfulness



The two sets of images illustrate how brain activity differs when we contemplate financial losses and gains.

- The blue areas at left are those that become deactivated as we make decisions that will likely cause us to lose money.
- The orange and red areas at right show the activation that occurs in the brain when we believe the odds are in our favor and we'll win money.



(Tom et al., 2007)

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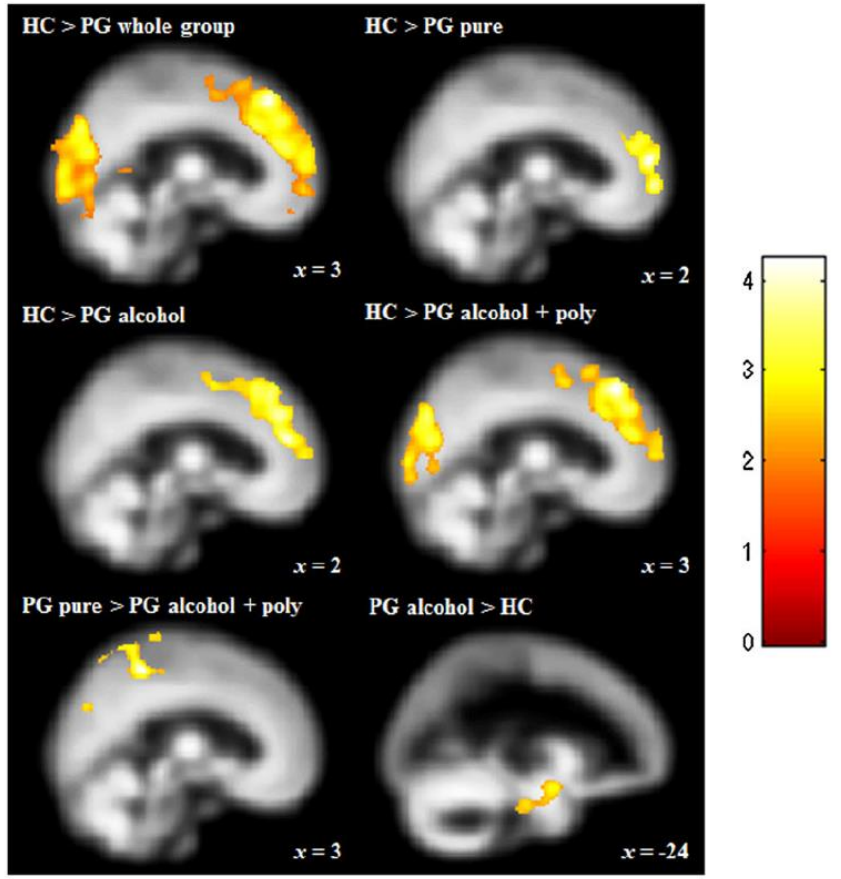
Impact of Gambling on the Brain
(Zois et al., 2016)

Regardless of SUD

- Those with GD had decrease frontal cortex gray matter
- Amount of time gambling associated with decrease gray matter in part of brain that plays role in social awareness and behavior

GD with SUD

- Decreased gray matter in anterior cingulate (role in emotional regulation) and precuneus (avoidance) and increased gray matter in amygdala (role in emotion, fear and danger)



- Role of dopamine in GD remains controversial
- Dopamine dysfunction within frontostriatal circuits
- Dopamine dysfunction leads to increased reward anticipation and greater sensitivity to uncertainty
- Increased impulsivity linked to dopamine dysfunction

(Peters et al, 2020; Kayser, 2019)

Habit Formation

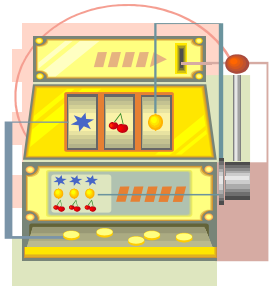
Novelty

Rewards

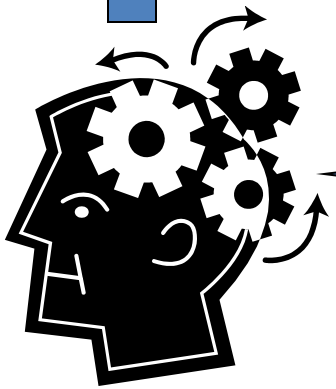
•Intermittent

•Random

•Unpredictable



Dopamine



Sensitization

Increases motivational drive

Narrows scope of motivational drives

Habit Formation

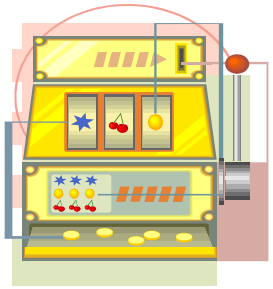
Novelty

Rewards

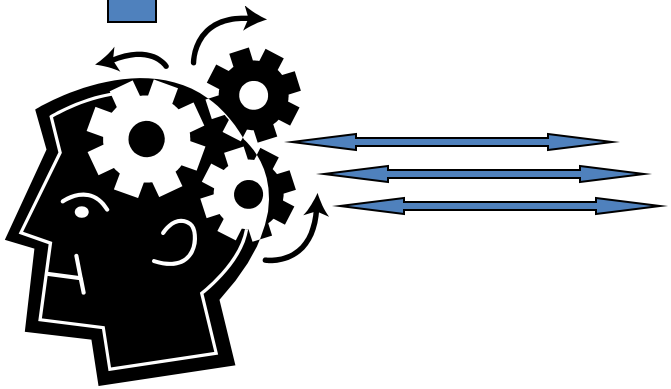
•Intermittent

•Random

•Unpredictable



Dopamine

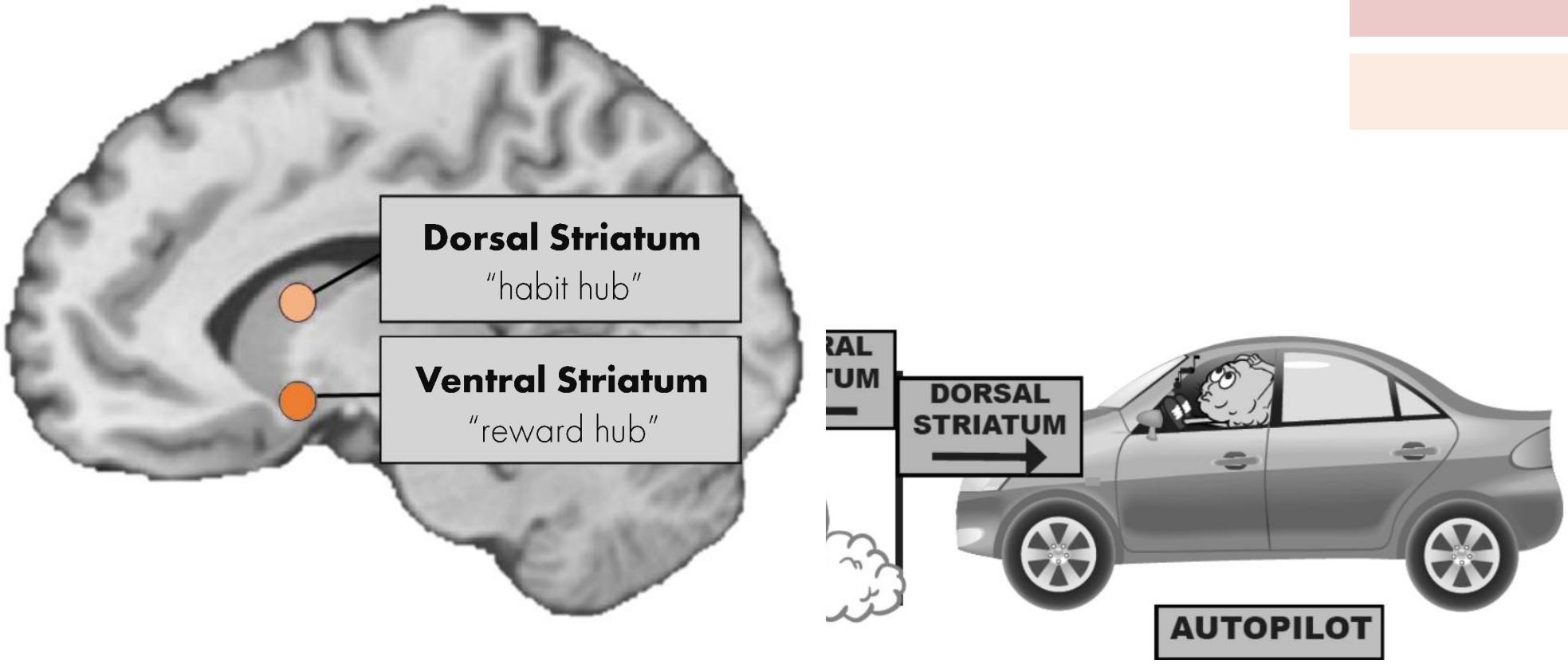


Increased habit based performance

Learning based on immediate rewards

Decrease ability to learn from experience

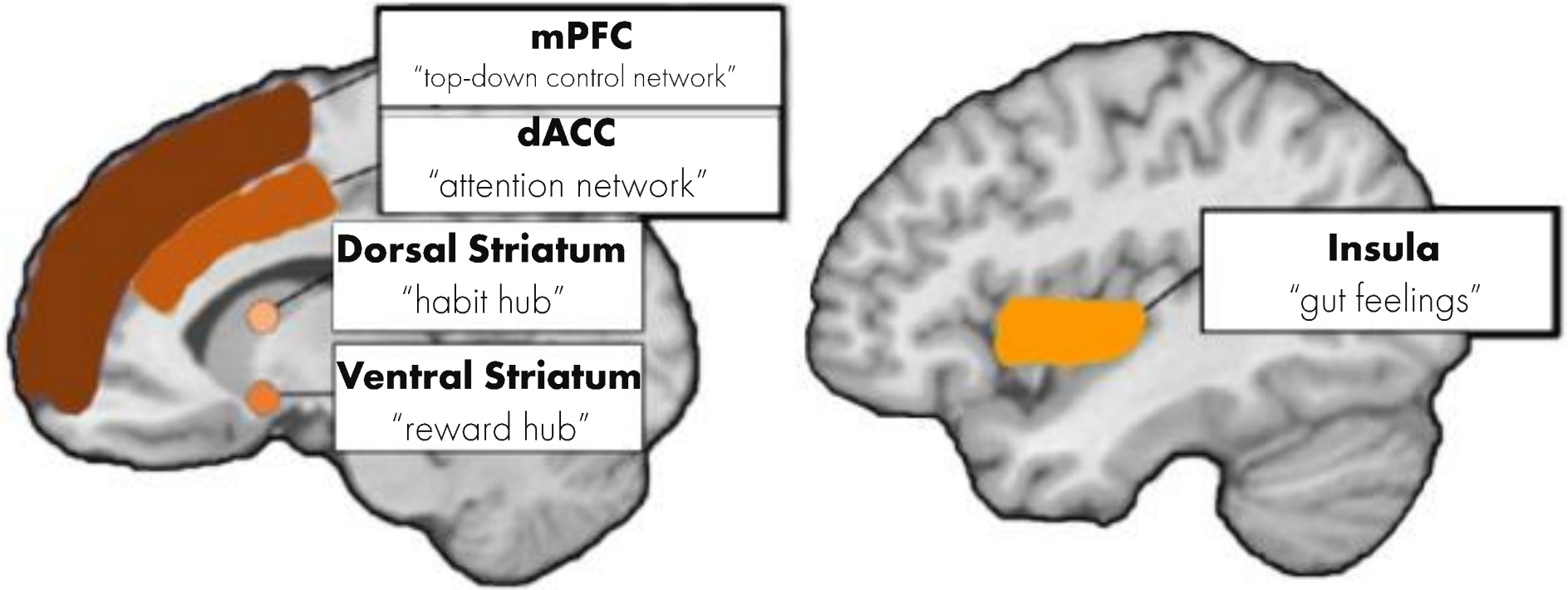
Inflexible response patterns



Development of Habitual Behavior

(Balodis et al., 2016)

Reward Processing



(Balodis et al., 2016)

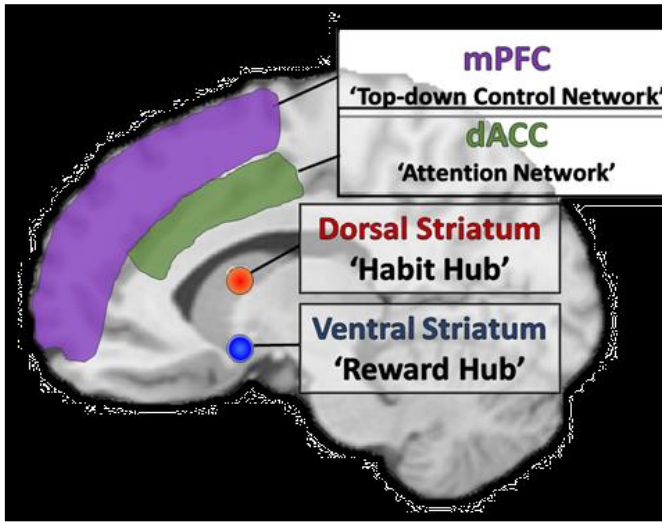
Reward Processing

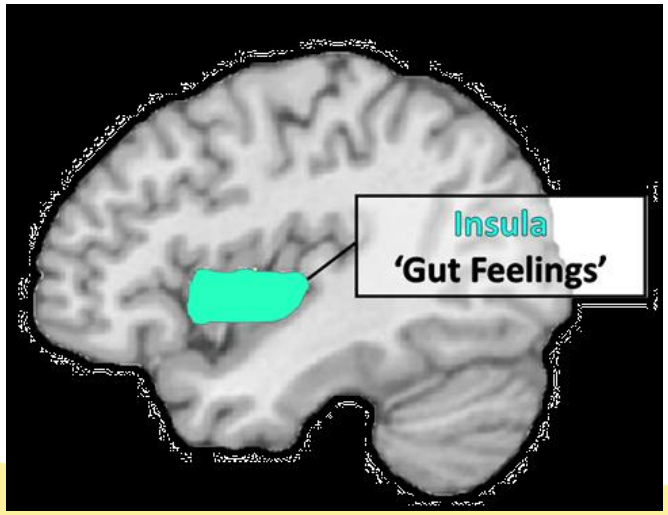
- Liking to wanting
- Decrease impact of "natural rewards"
- Preoccupation, salience of cues
- Stopping gambling or drug use may result in anhedonia
- Also, less activity in the top-down control network
- Harder to notice "stop" signals and put on brakes for new addictive behaviors

(Balodis et al., 2016)


UN
HAPPINESS

Gambling Urges





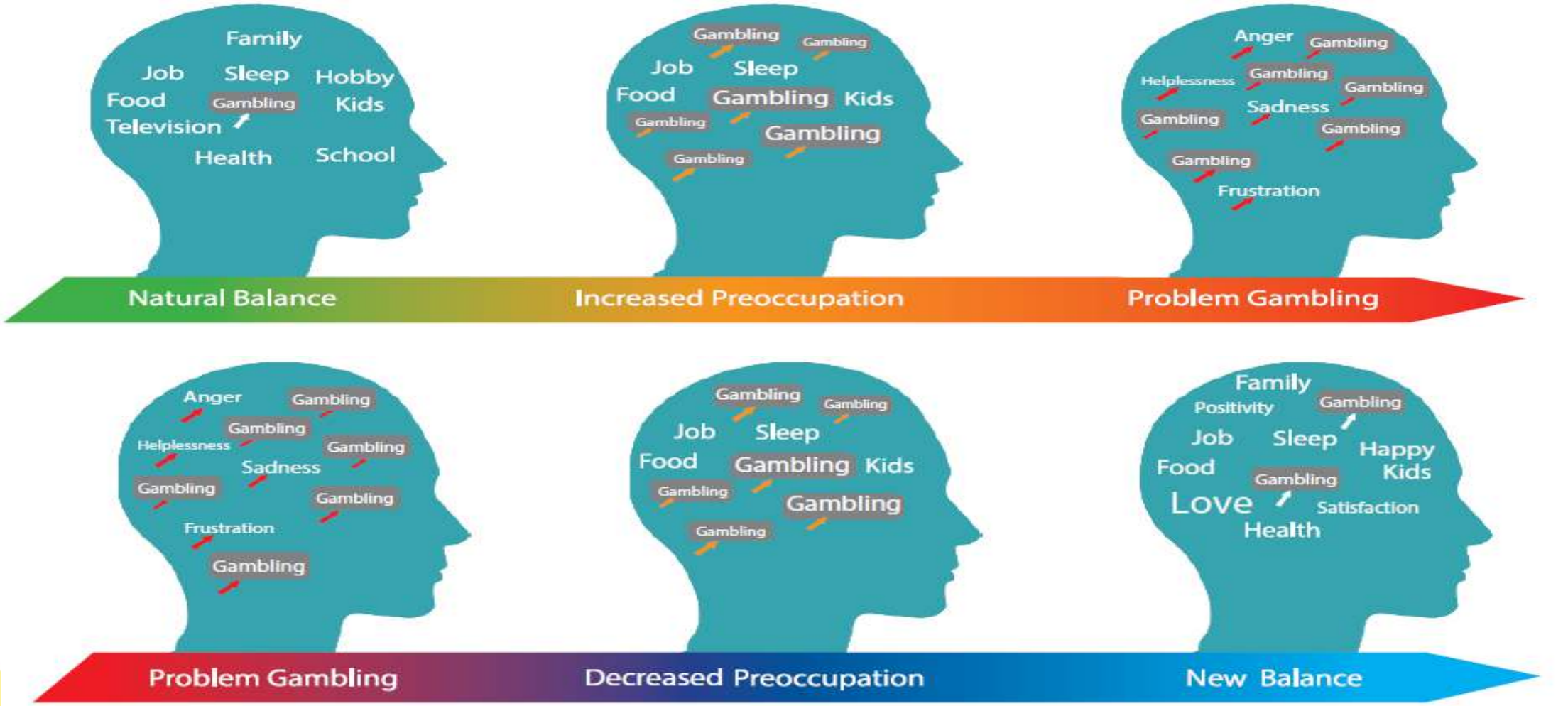
- Attention Network (habit hub and dACC):
  - Can become overly sensitive to gambling cues
  - Have poor communication between mPFC and dACC (difficulty putting on brakes)
  - Insula processing urges and drive to act on urges

Gambling Urges Script

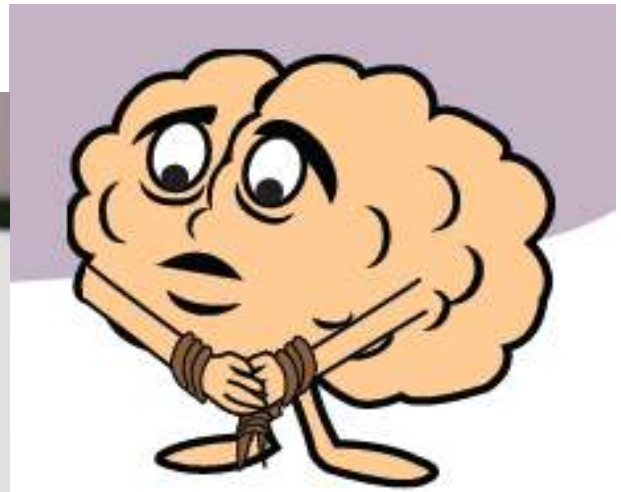
- Create script for the how the brain experiences a gambling urge (Urges pg 2 and 3)
- Characters:
  - mPFC
  - dACC
  - Striatum
  - Insula

Changing Set Points

I'm not gambling, why don't I feel good?



Brain – Device Interaction



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Losses Disguised as Wins

"A multiline EGM with 15 playable lines (*left*) is presented and an example of an LDW (*right*). In this example, by betting 75 credits, on 15 lines at 5 credits each, the player's win of 30 is 45 credits lower than the cost of play, presenting as a LDW." (Barton et al., 2017)

Near Misses

(Habib et al, 2010; Clark et al, 2009)

- Light up reward circuitry the same as wins
- Rated as unpleasant but simultaneously rated desire to continue the game as higher after near miss
- Subjects play machines with near misses longer than those without

Near Misses and Gambler's Fallacy

(Clark et al, 2014)

- Study of brain damaged patients
- All groups except those with insula damage reported heightened motivation to play following near miss.
- Also, on roulette games involving red and black predictions all groups fell prey to gambler's fallacy except those with insula damage.

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"Gambling on Smartphones: A Study of a Potentially Addictive Behavior in a Naturalistic Setting"

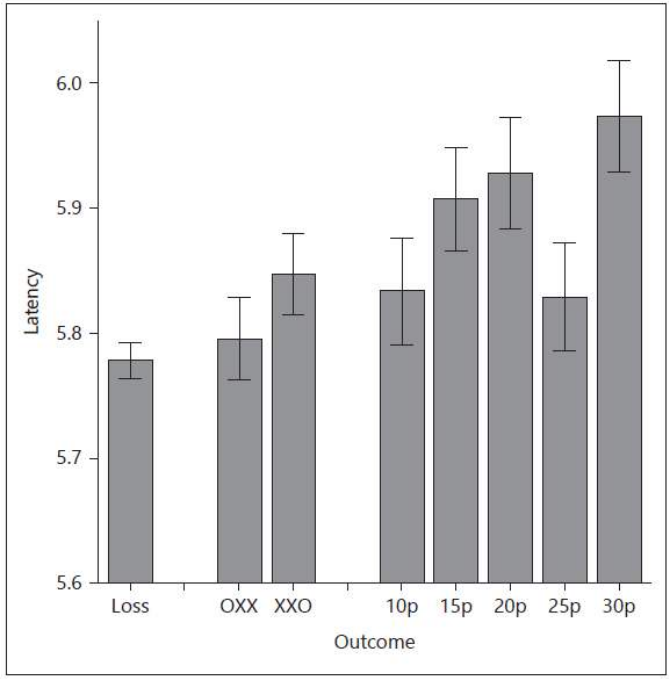


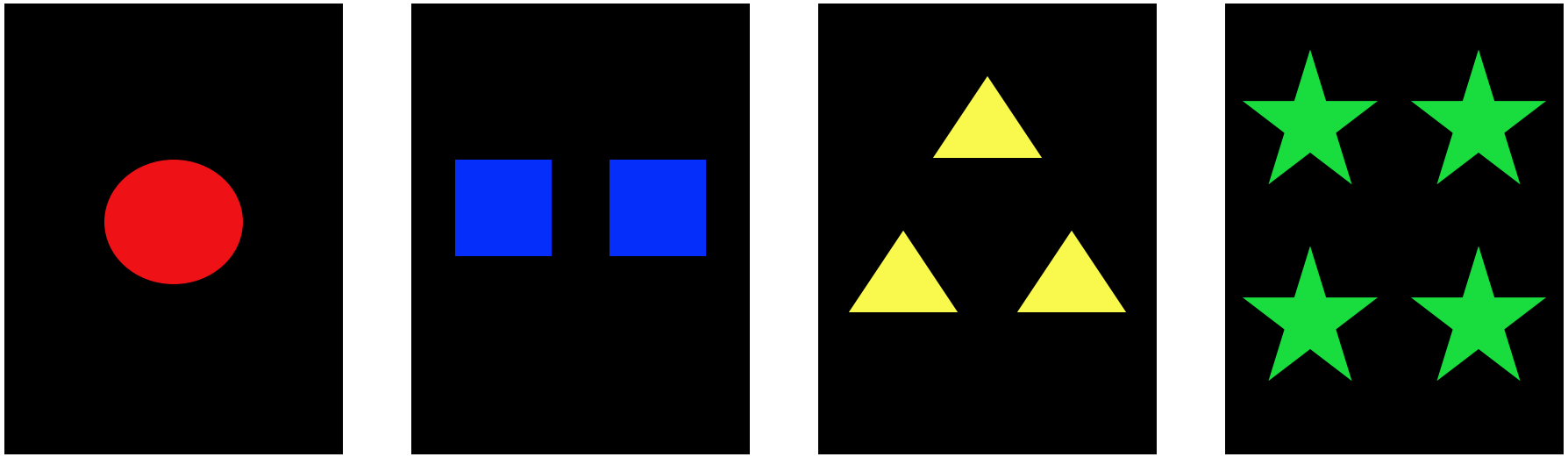
Fig. 2. Latencies (in seconds) between gambles for each type of outcome (p = pence), with error bars plotted as the SE of the mean.

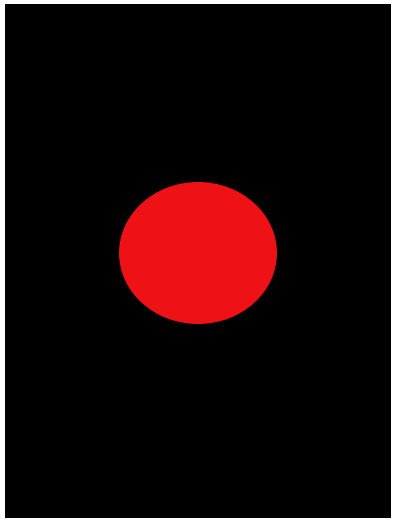
- When exposed to a simulated gambling game on their smartphones, participants showed evidence of considerable persistence in the face of losses.
- During a pre-programmed extinction period (last 2weeks) of unavoidable losses, most participants continued to return for multiple days of play.
- Participants had greater latencies between their gambles after a win relative to other outcomes and the size of this effect increased in line with the magnitude of reinforcement
- It is possible that reinforcement and latency can be fine-tuned by designers to elicit the desired behavior by users, even in the face of unsuccessful, frustrating outcomes.

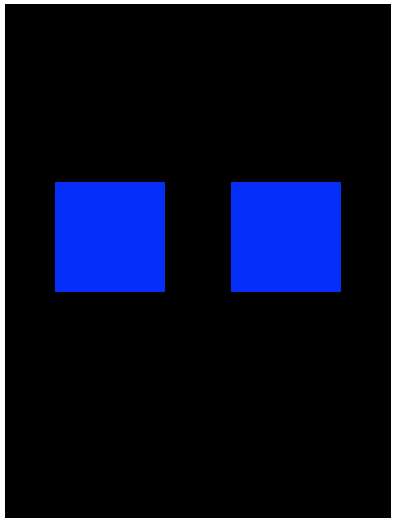
James, O'Mally and Tunney, published by S. Karger AG, Basel (2019)

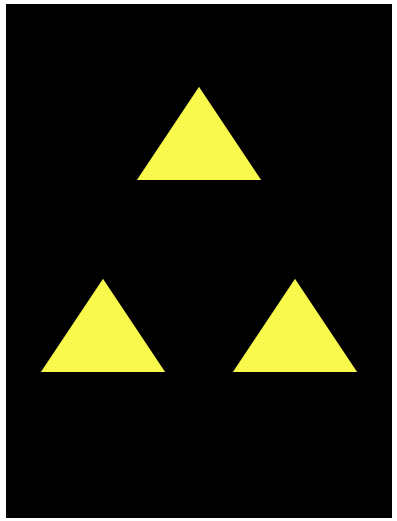
Risk Factors and Executive Function

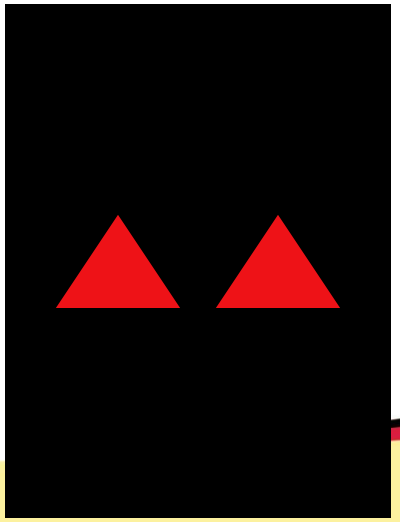
Rugle, 1993

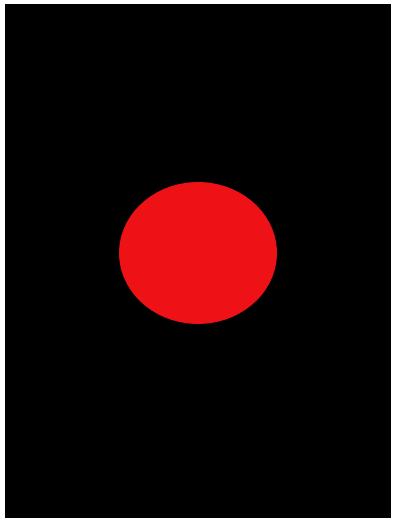


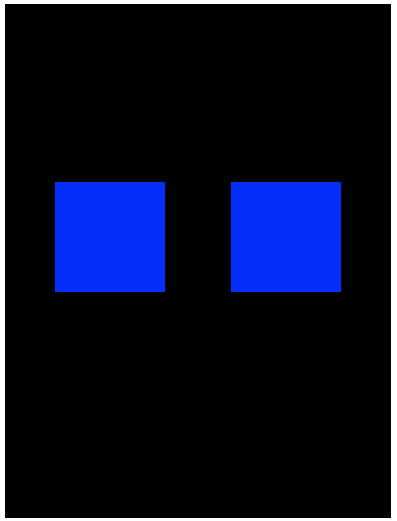


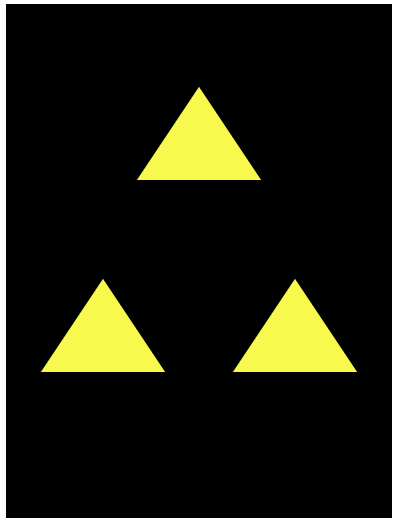


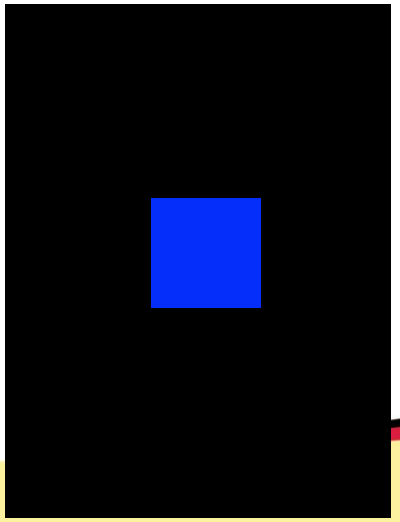


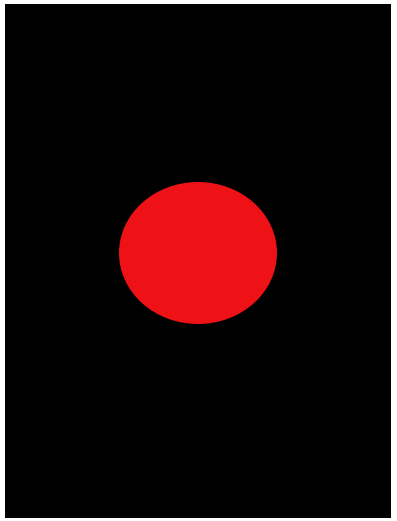


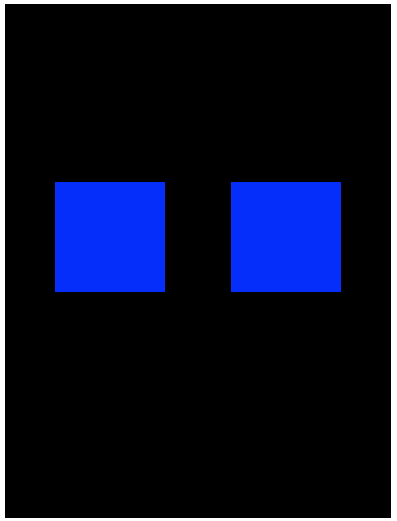


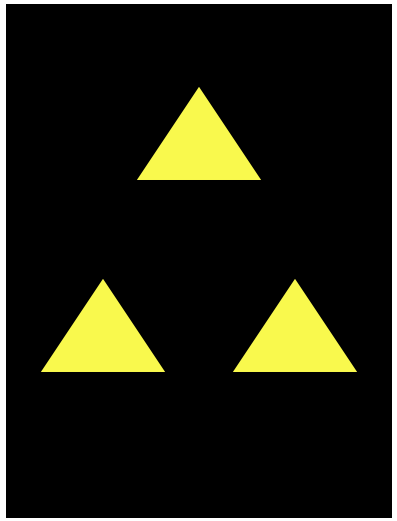


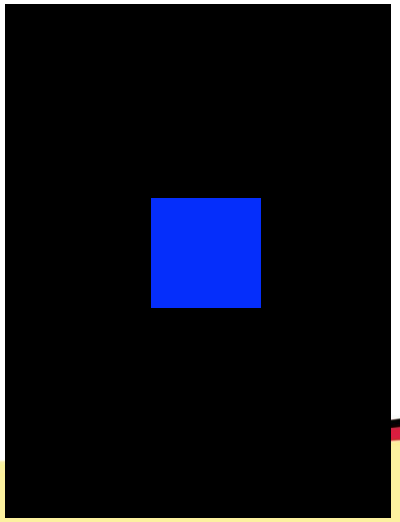


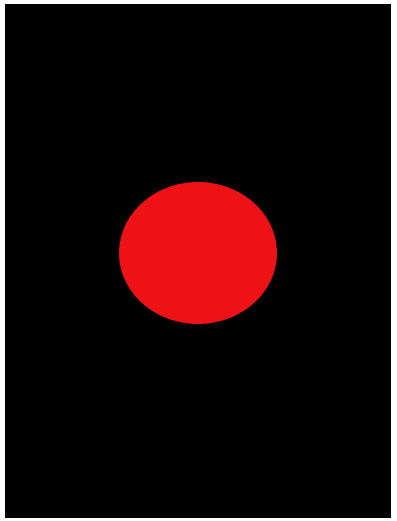


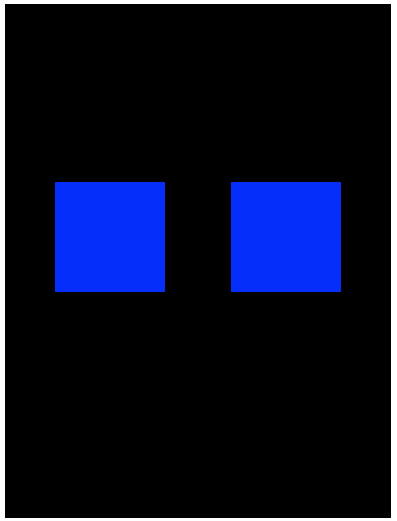


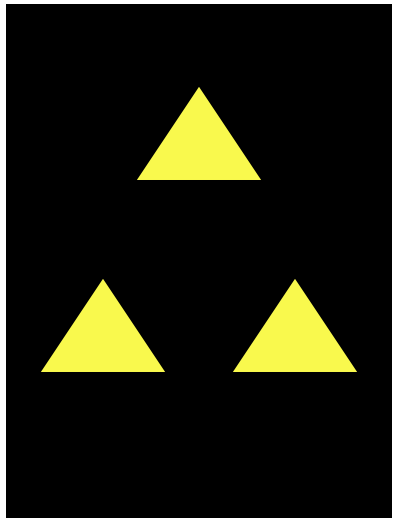


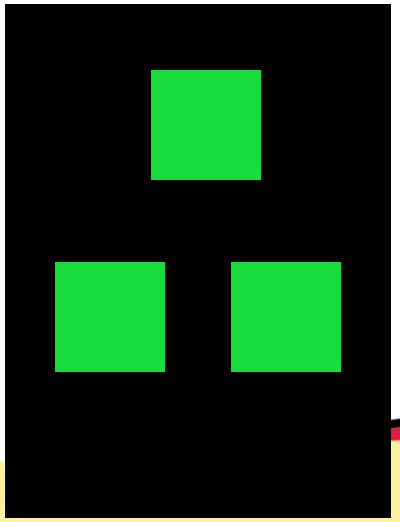


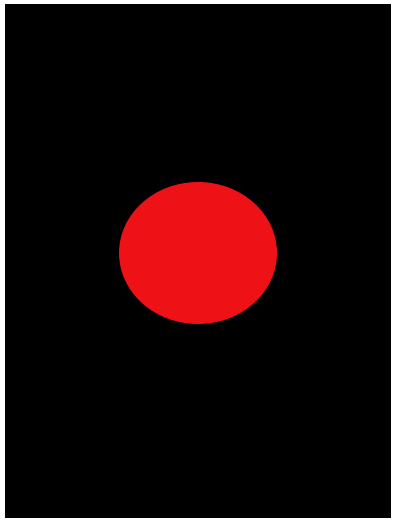


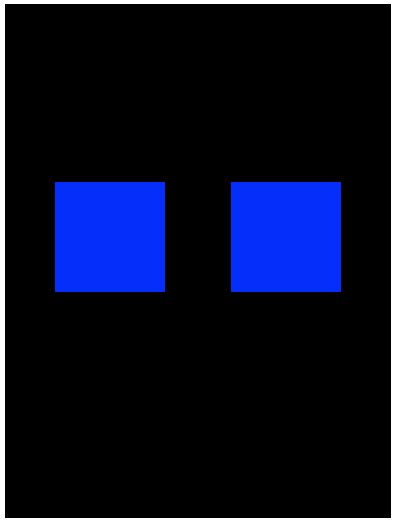


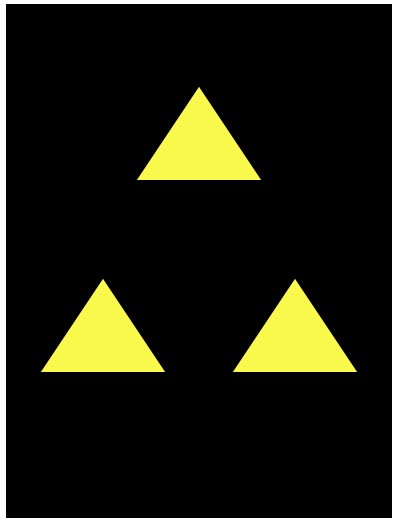


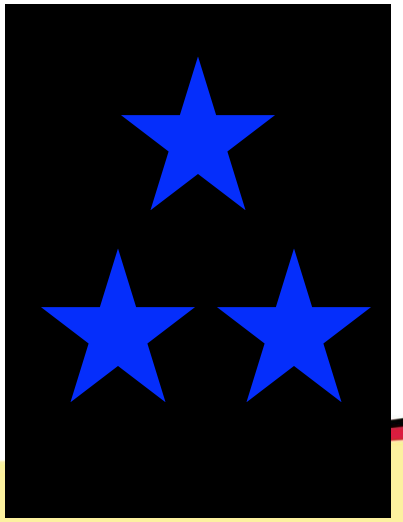


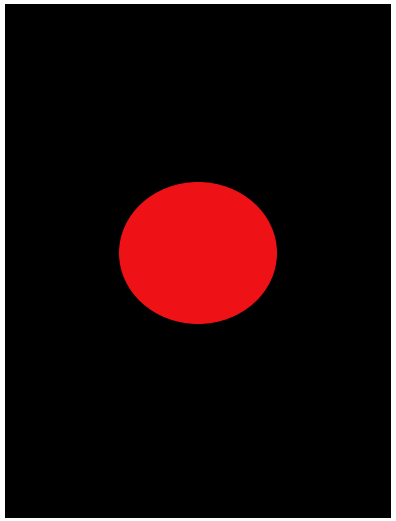


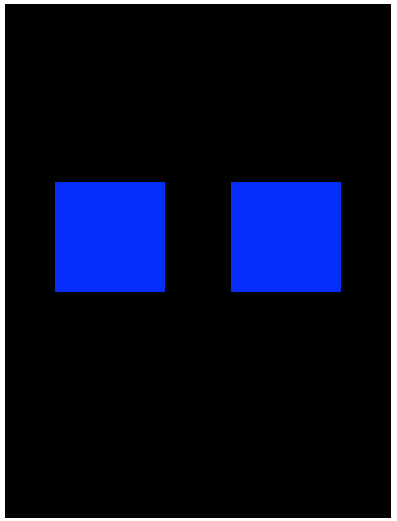


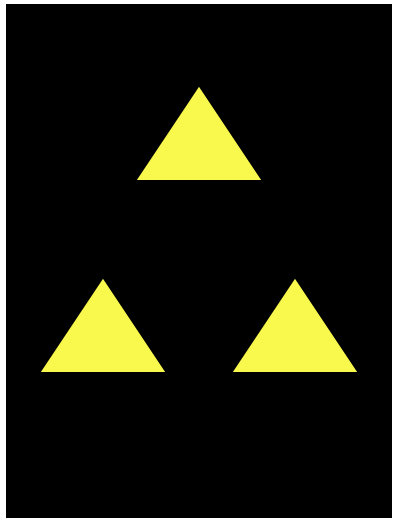


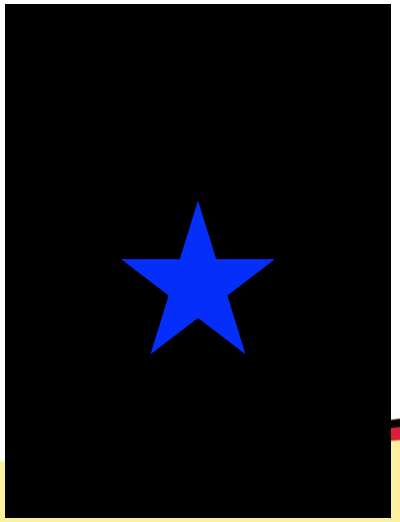


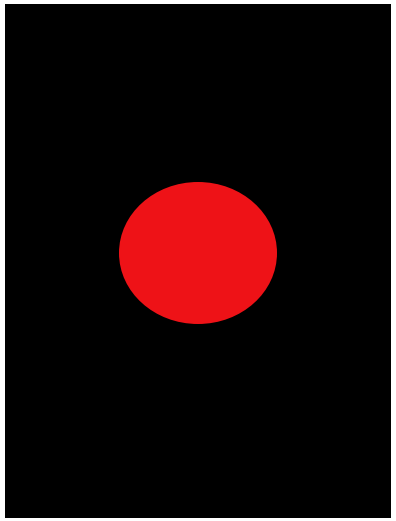


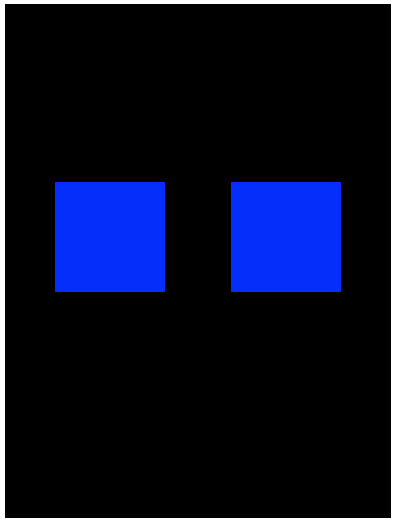


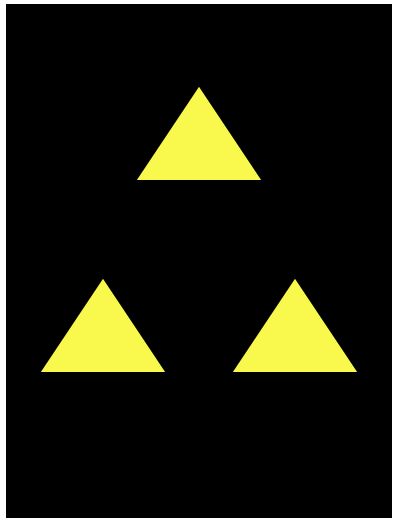


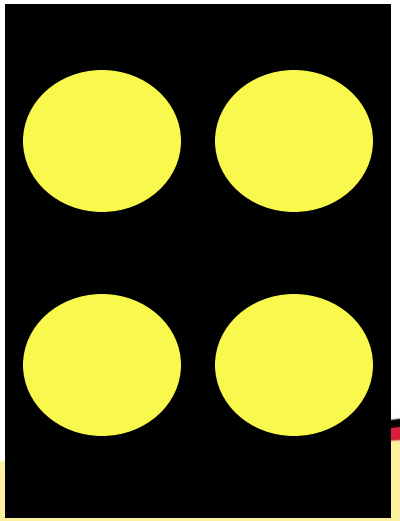


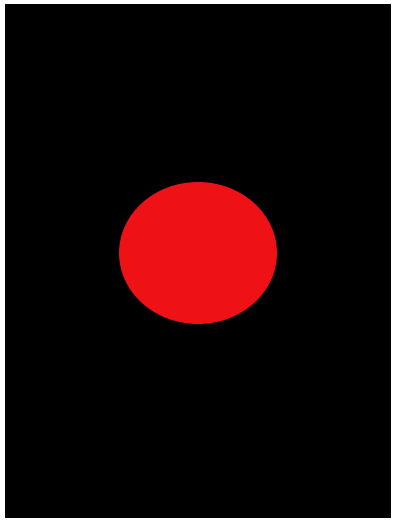


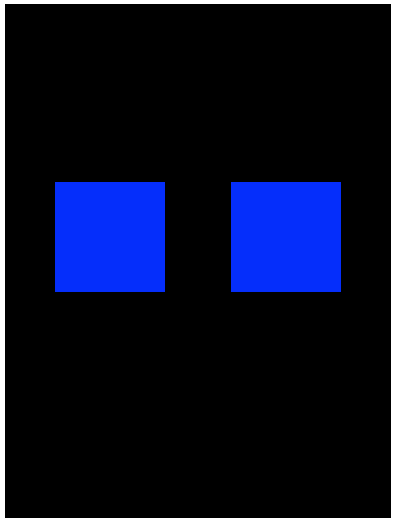


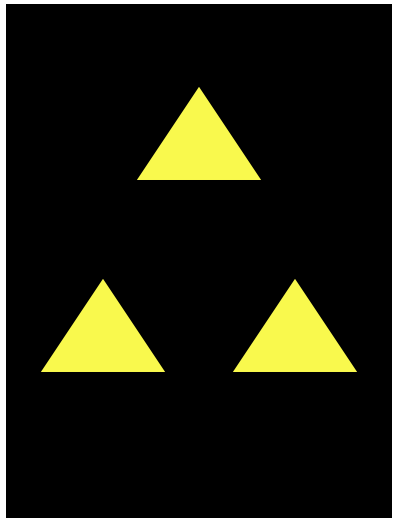


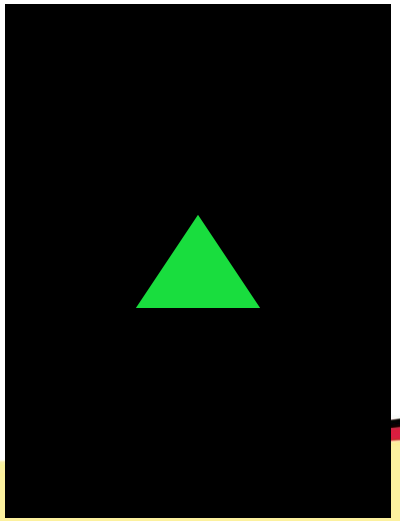


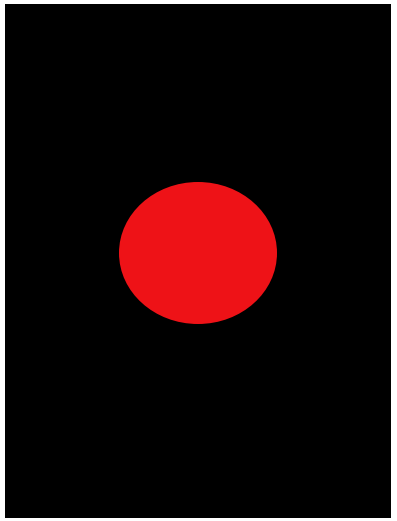


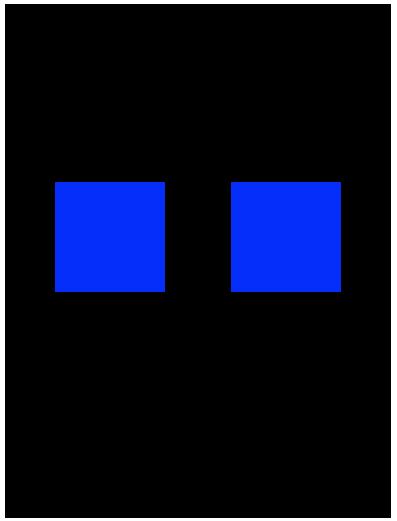


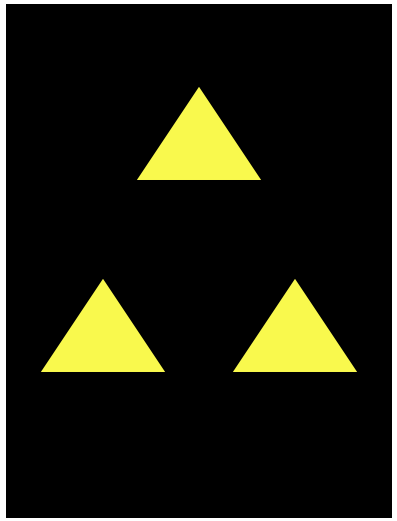


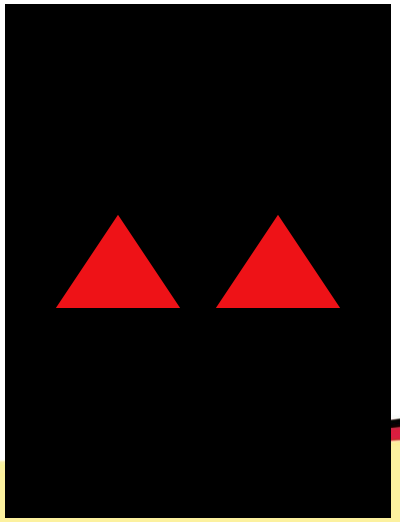


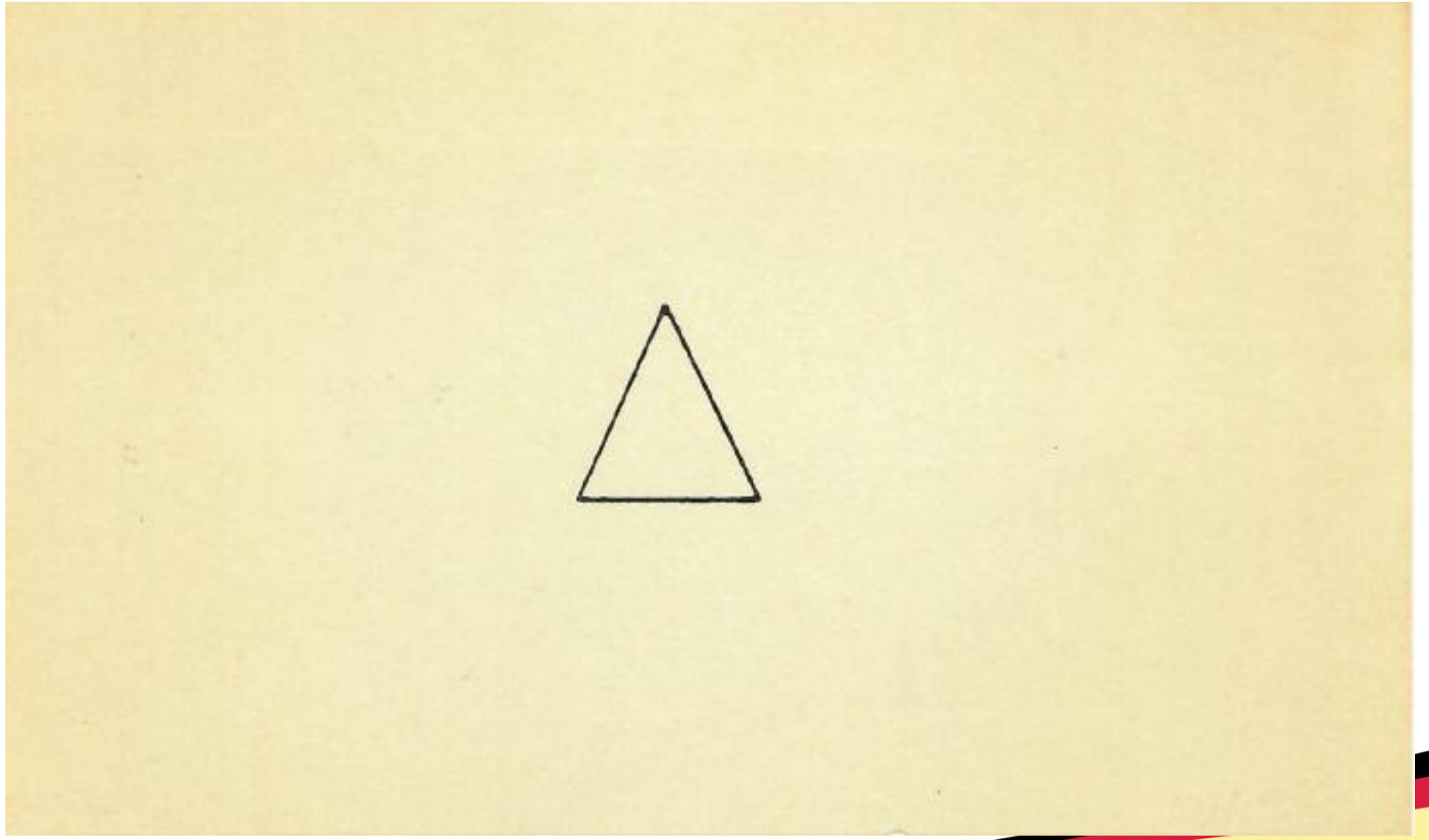


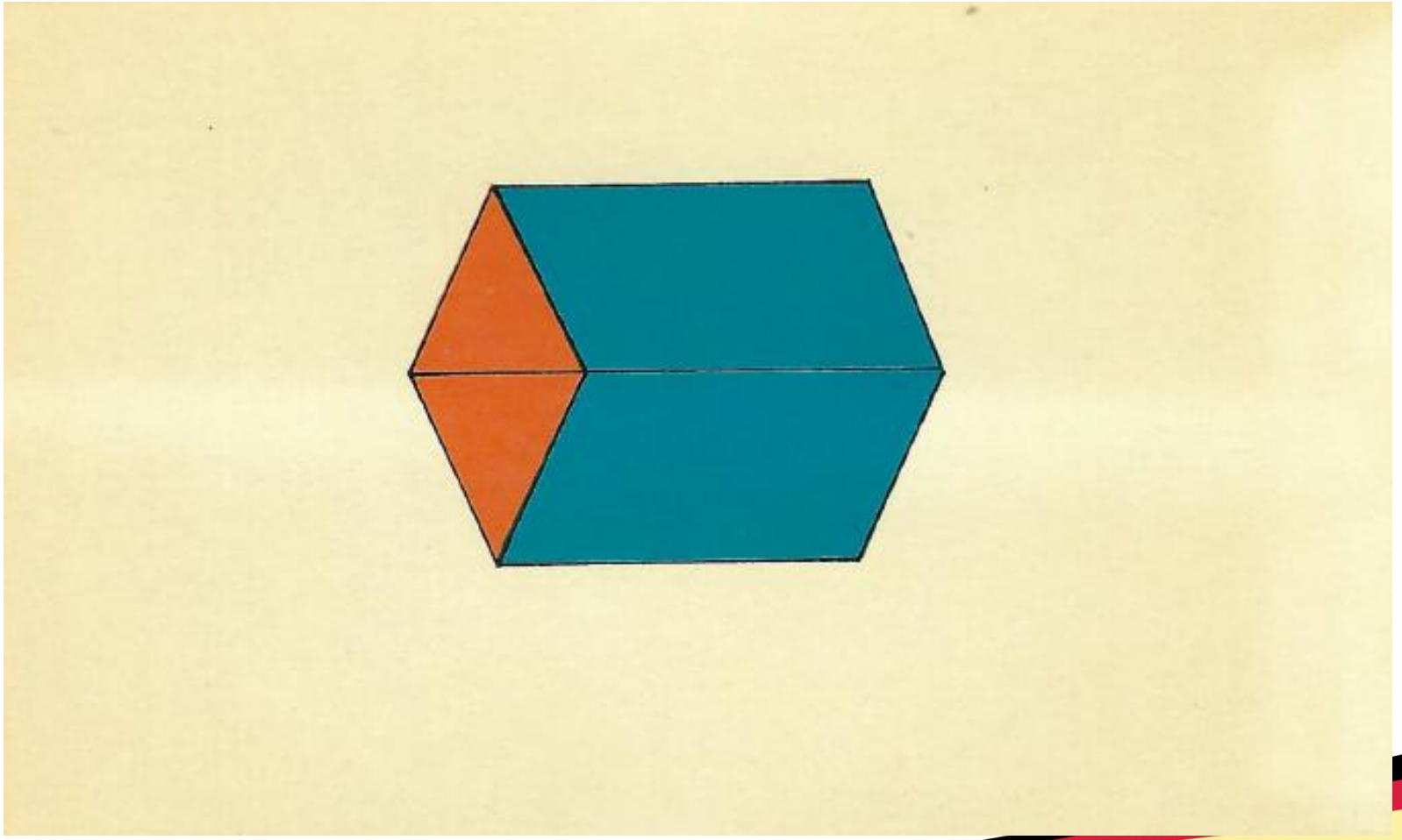


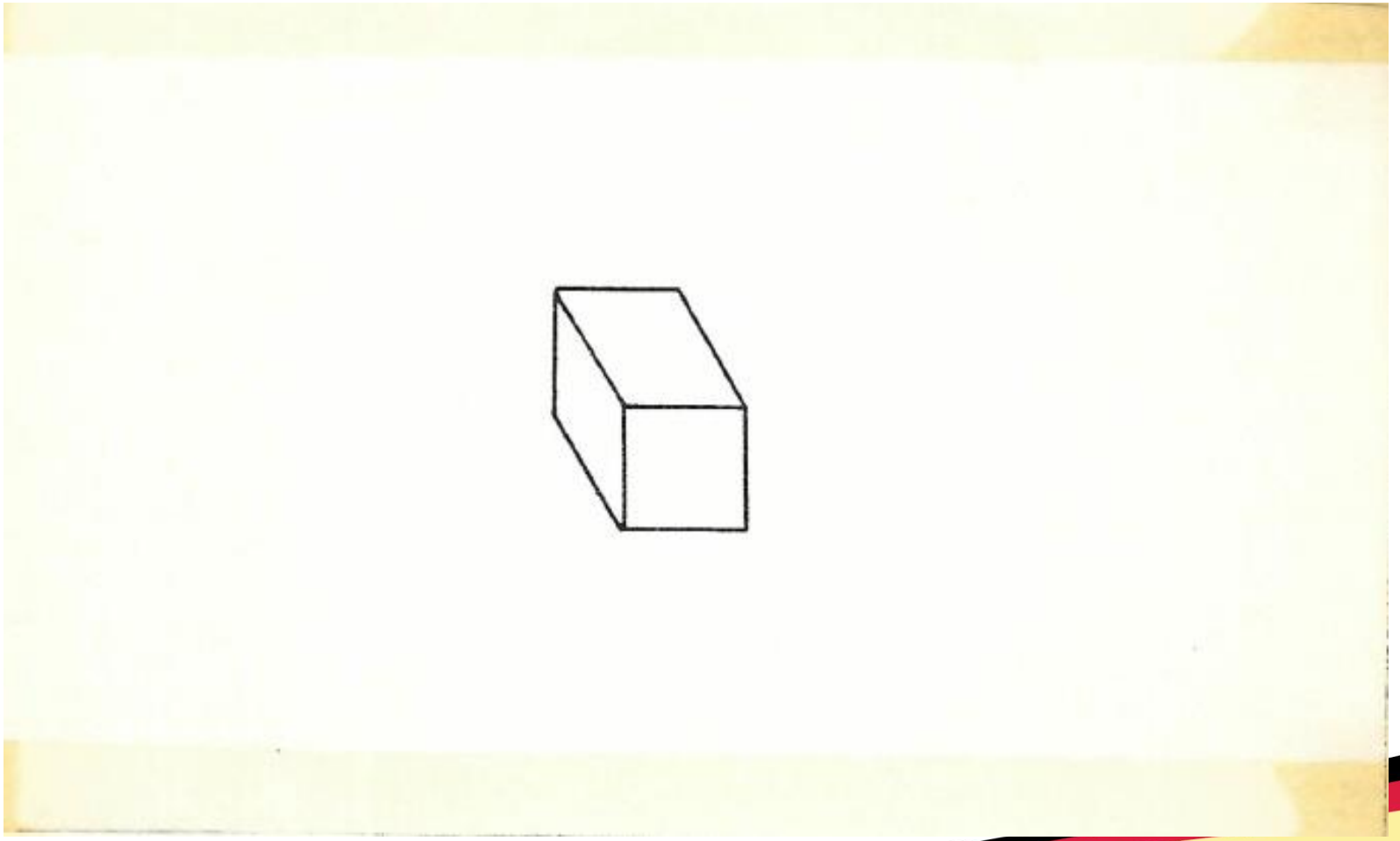


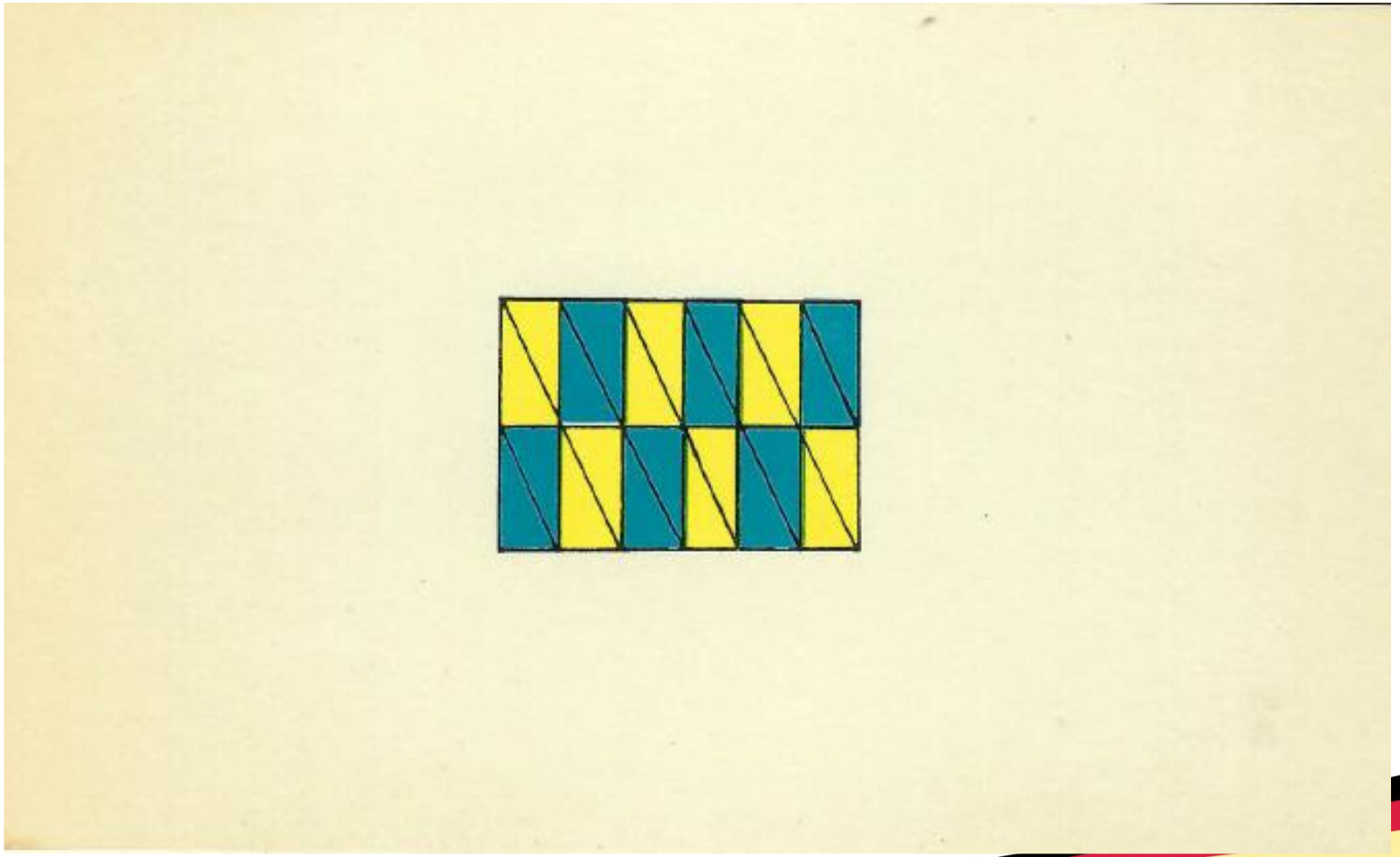


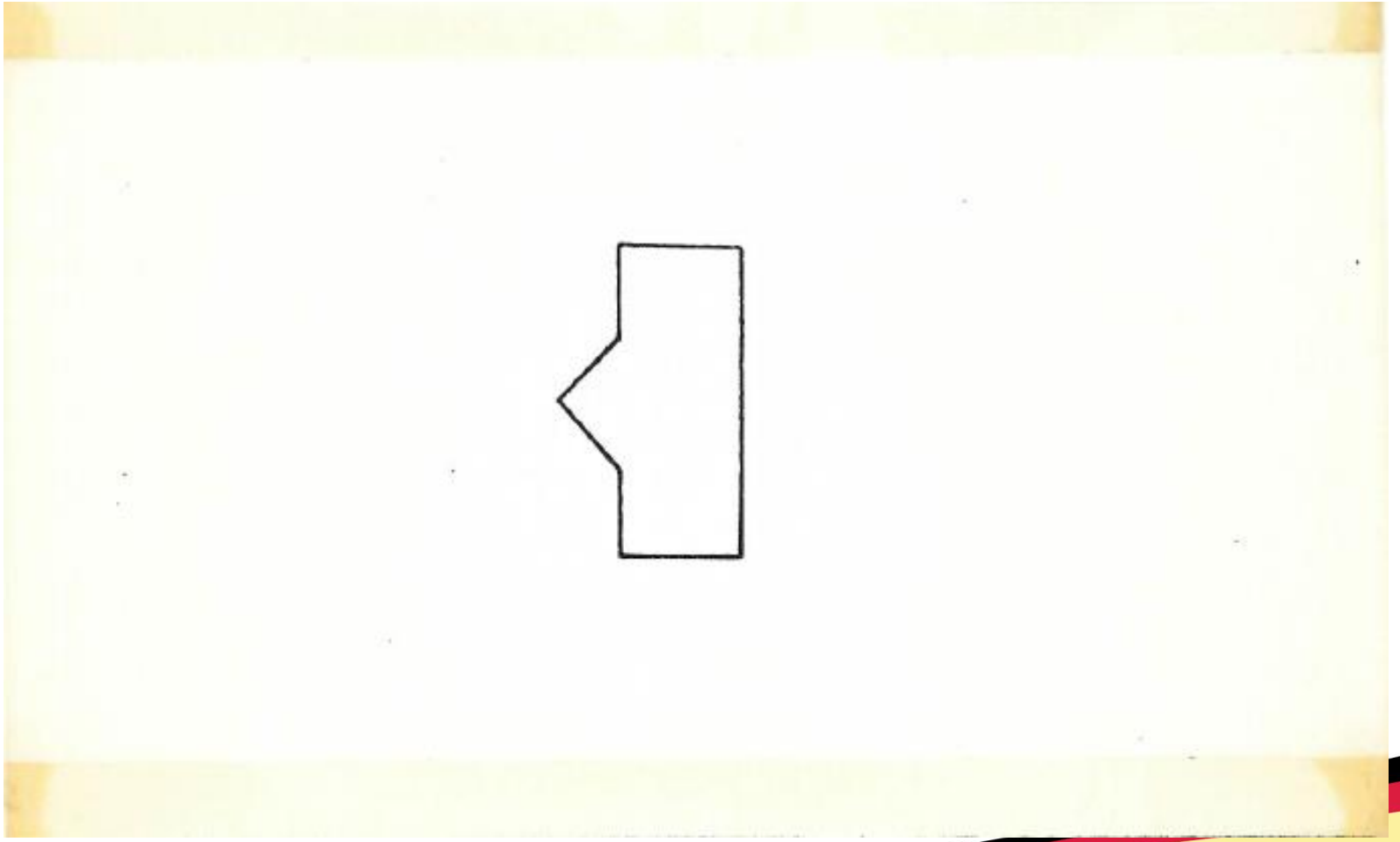


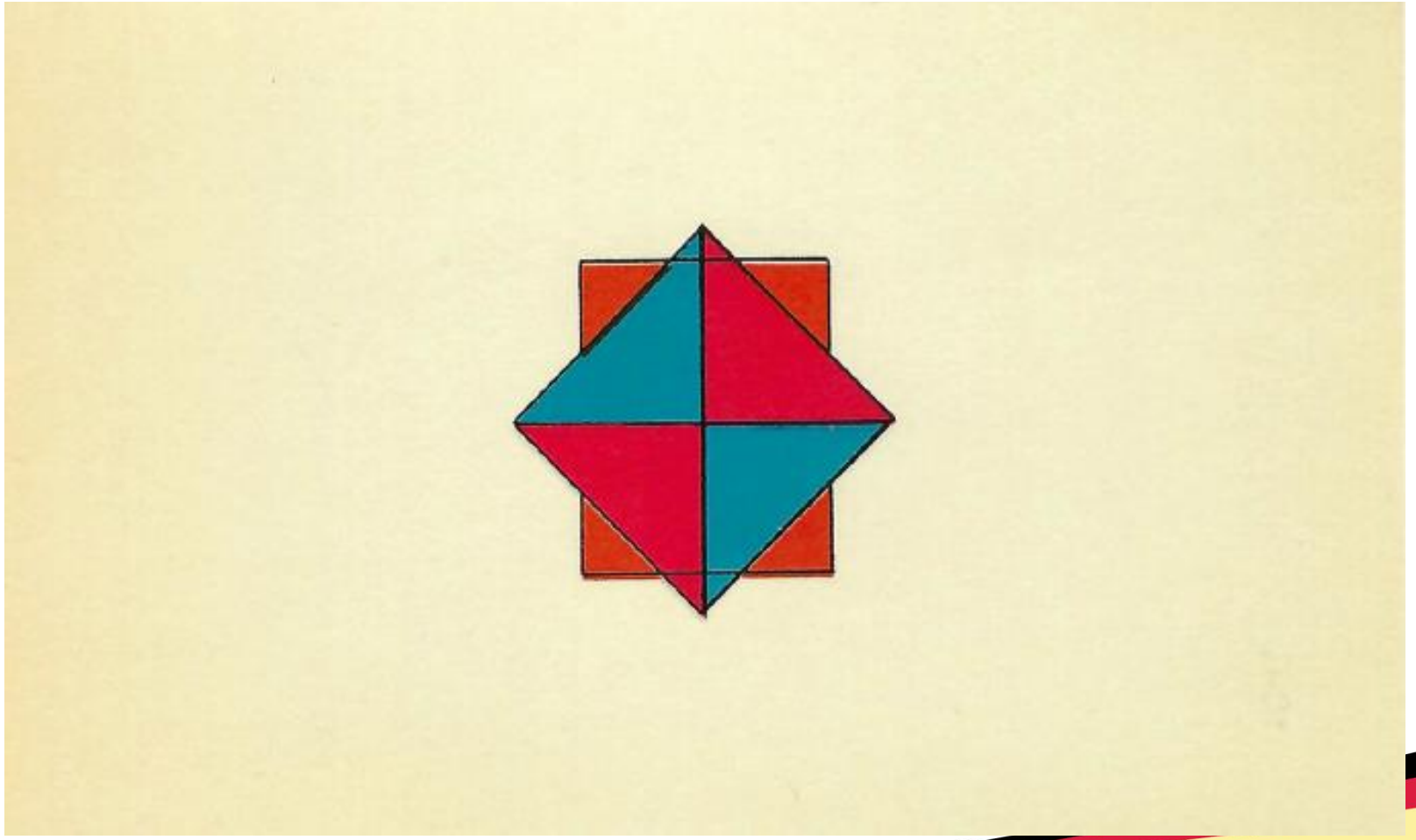


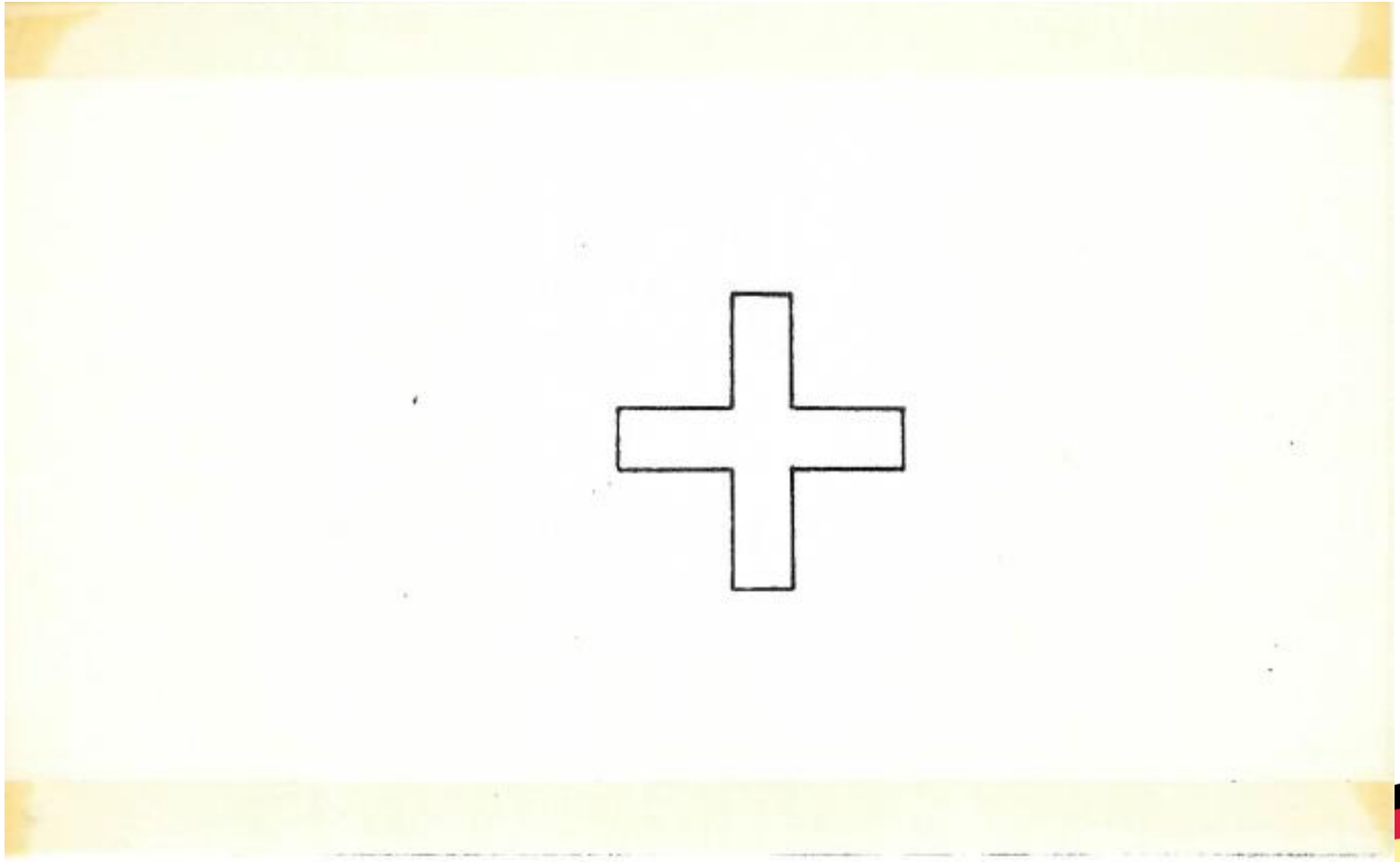


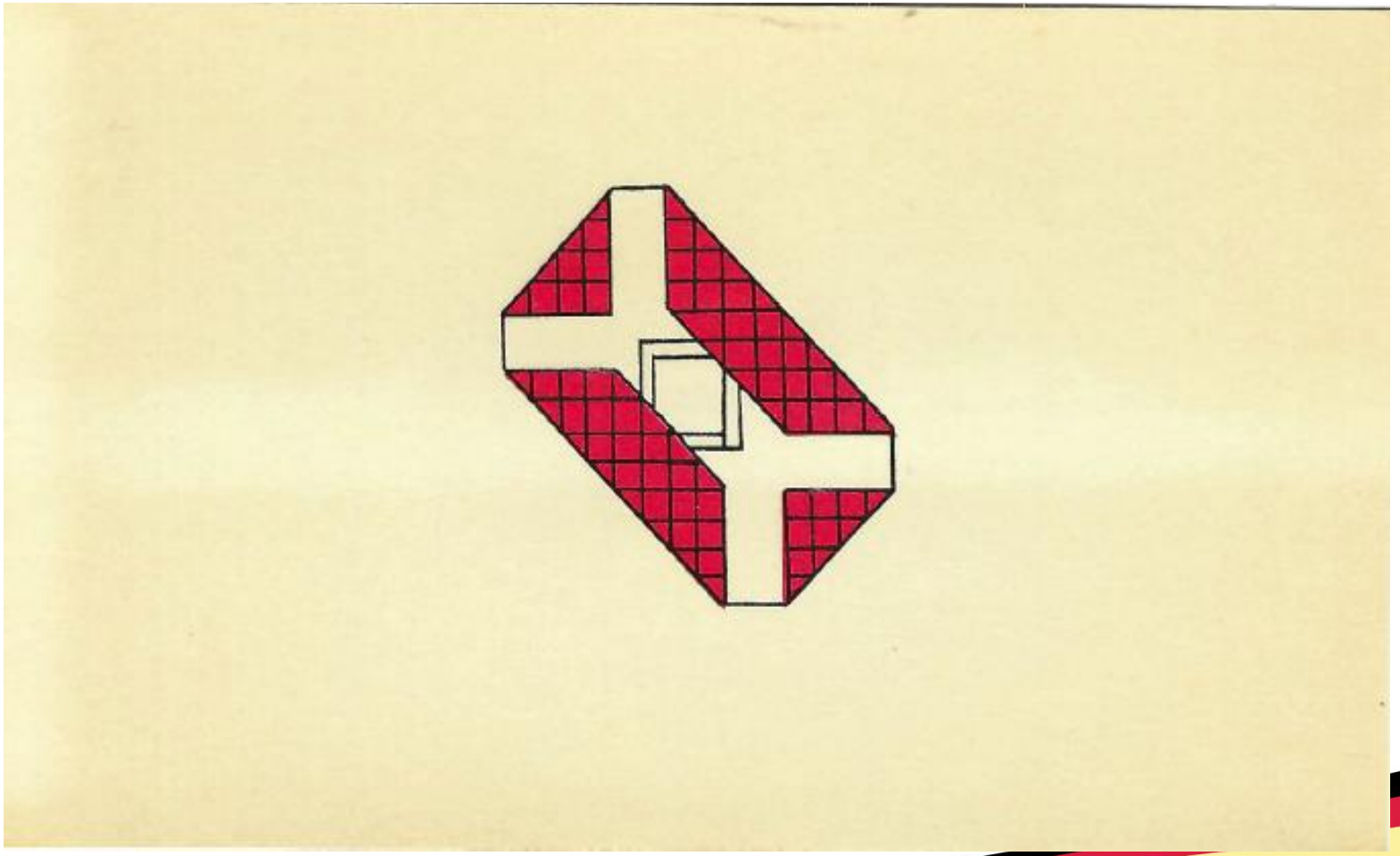












How Many Faces Do You See?

Find the Man

Landscape of Faces

Delayed Discounting

- $50 Now
- $60 Now
- $70 Now
- $80 Now
- $90 Now

- $100 1 week
- $100 1 week
- $100 1 week
- $100 1 week
- $100 1 week

Delayed Discounting and Impulsivity

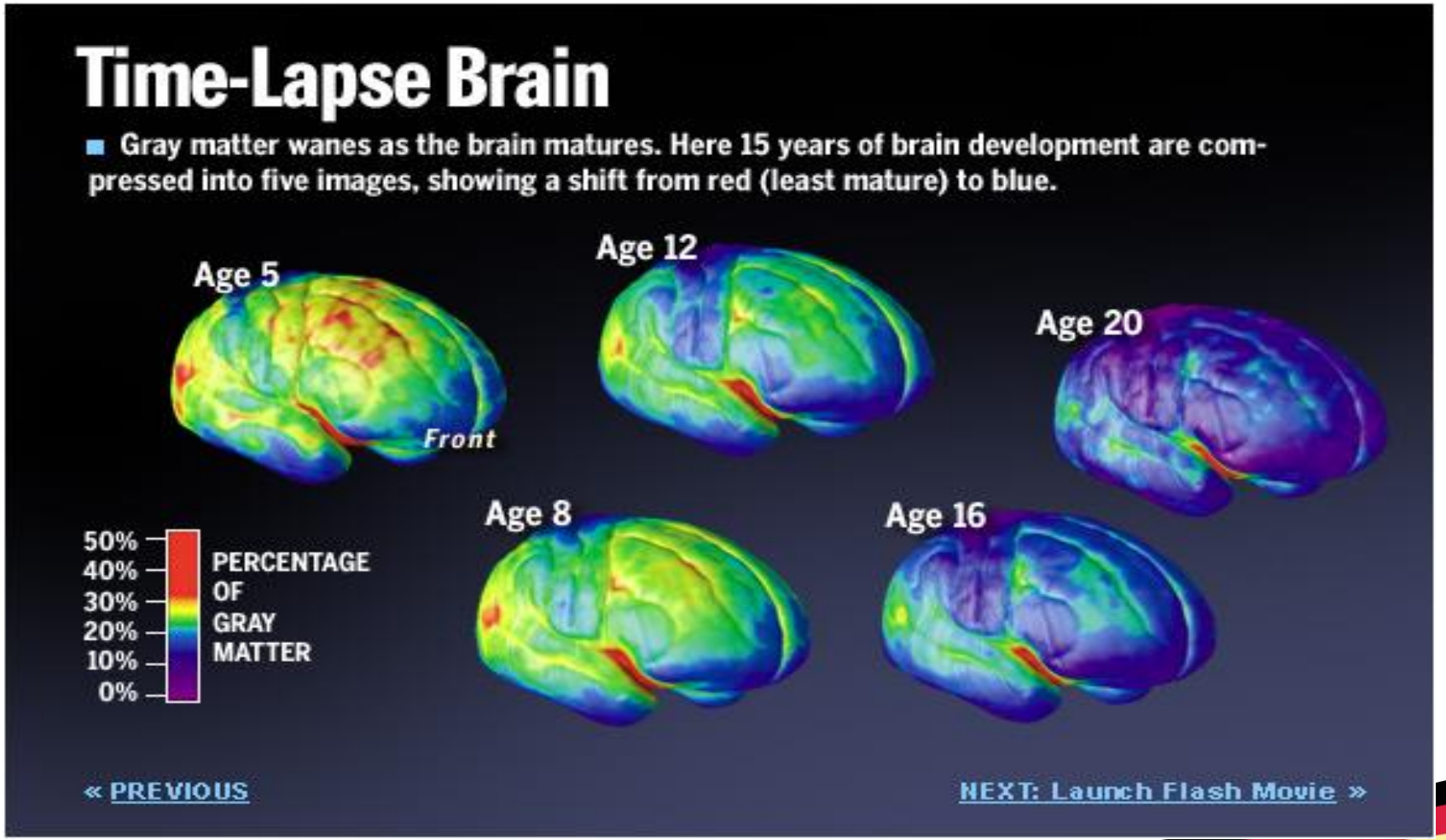
"For example, when choosing between small, immediate rewards that are delayed, [people with a gambling disorder] discount larger delayed rewards and are more likely to choose smaller, more immediate rewards, a phenomenon also seen in the substance use population."

(Holtgraves, 2009, p. 3)

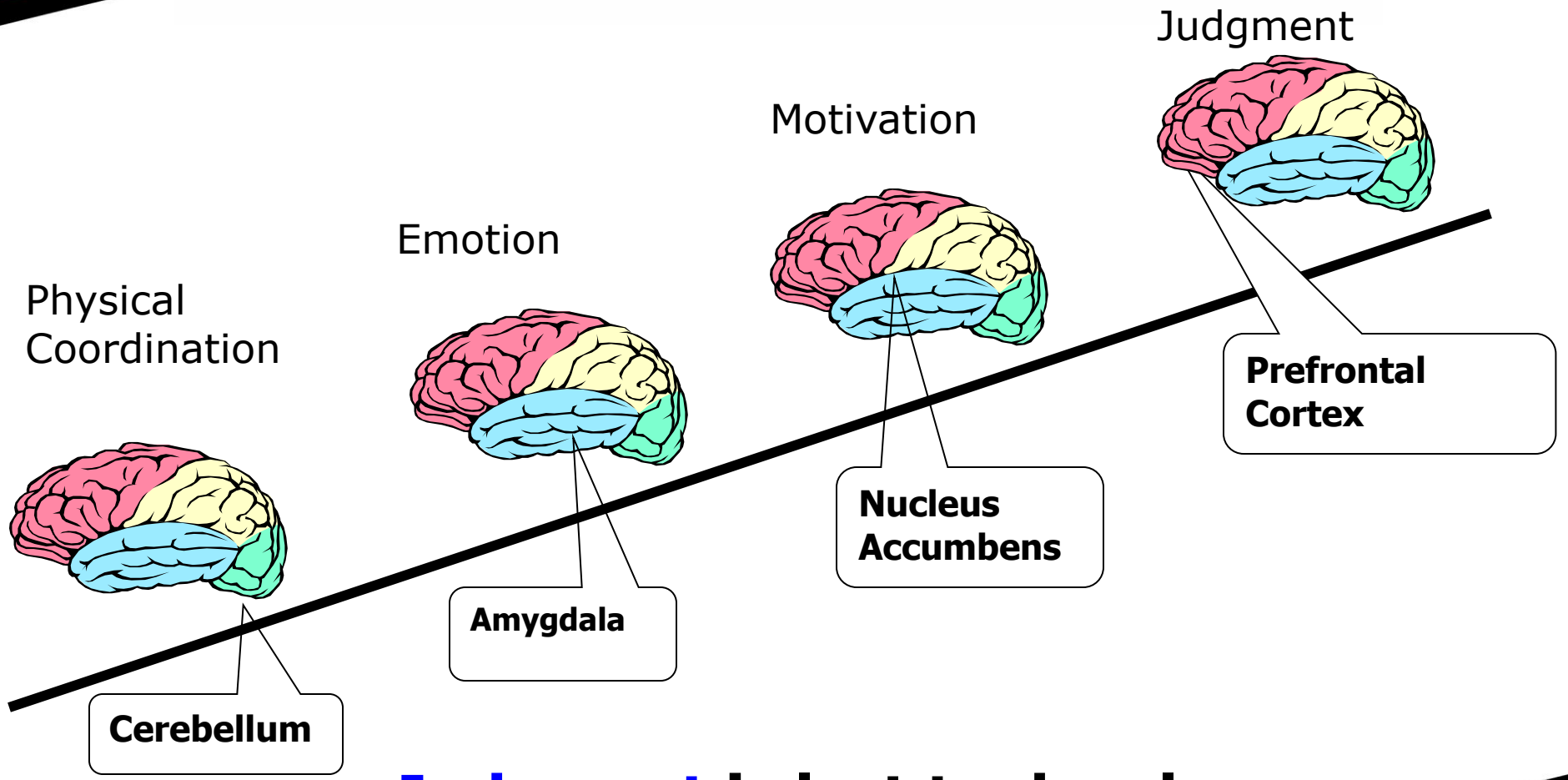
Gambling and the Brain

- Lessons From the Damaged Brain
  - **Subjects with brain damage to amygdala and prefrontal cortex**
    - **Both brain damaged groups did not show preference for "winning" decks of cards**
    - **Amygdala patients unable to evoke physical responses after winning or losing**
    - **Prefrontal experienced physical changes but those did not affect decision making**

Normal Brain Development



Neurological maturation starts at the back of the brain, and moves to the front



Judgment is last to develop!

Use It or Lose It

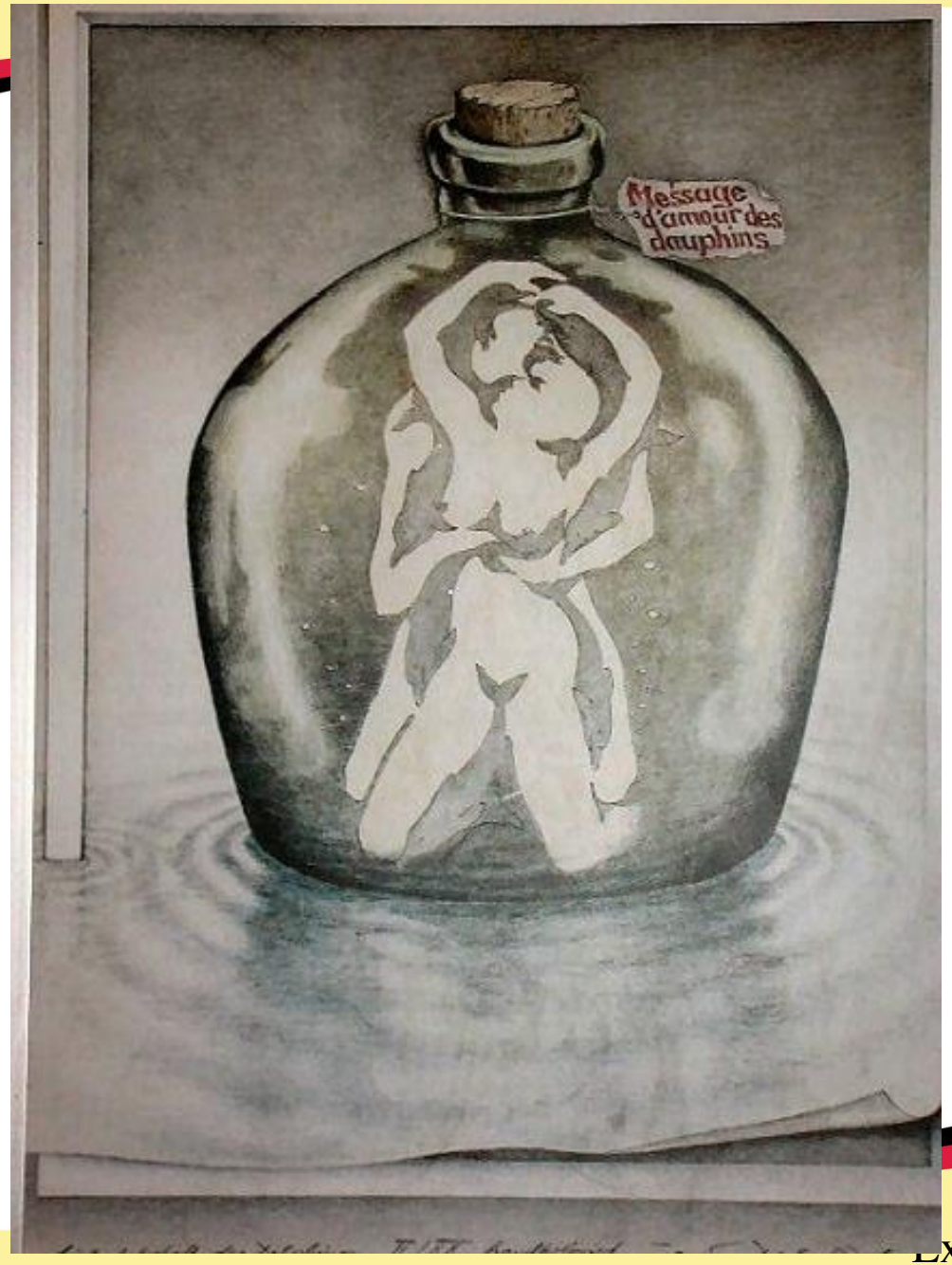
- If a teen is doing music or sports or academics, those are the cells and connections that will be hardwired. If they're lying on the couch or playing video games [or online poker], those are the cells and connections that are going to survive

Motivation and Reward

- Dopamine system stronger impact in adolescence
- Novel stimuli rewarded by burst of dopamine
- Compared to adults, the robust dopamine system of adolescence will contribute to a more heightened reward experience in the face of novel stimuli

Starting the engines without a skilled driver

- Earlier timing of puberty results in several years with a heightened reward system ("igniting passions")
- Yet with *relatively immature neurobehavioral systems necessary for self-control and affect regulation*
- **Predict: increased risk for disorders of self-control; difficulties navigating complex social-emotional situations**


Message
d'amour des
dauphins

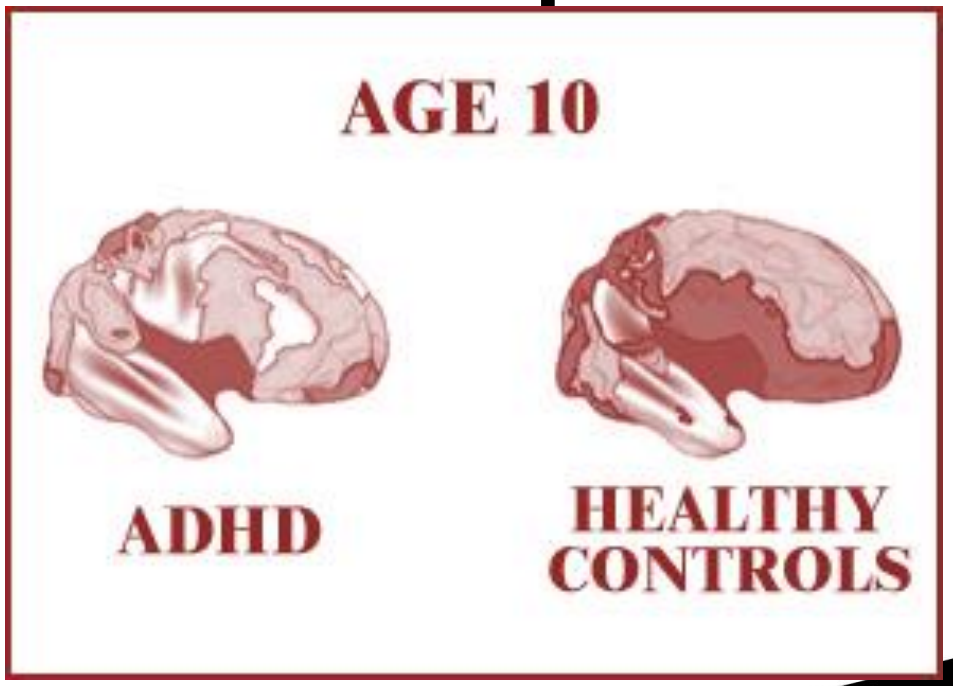
ADHD as Heightened Risk

- Growing evidence that ADHD is a dysfunction in the brain's regulatory systems that manifests as a deficit in behavioral dysregulation
- This dysregulation is mediated by deficits in the prefrontal cortex
- These deficits in prefrontal cortex contribute to disorders likely related to self-regulation, including drug abuse and problem gambling

(Groen et al., 2013; Tenenbaum, 2019)

ADHD and Brain Development

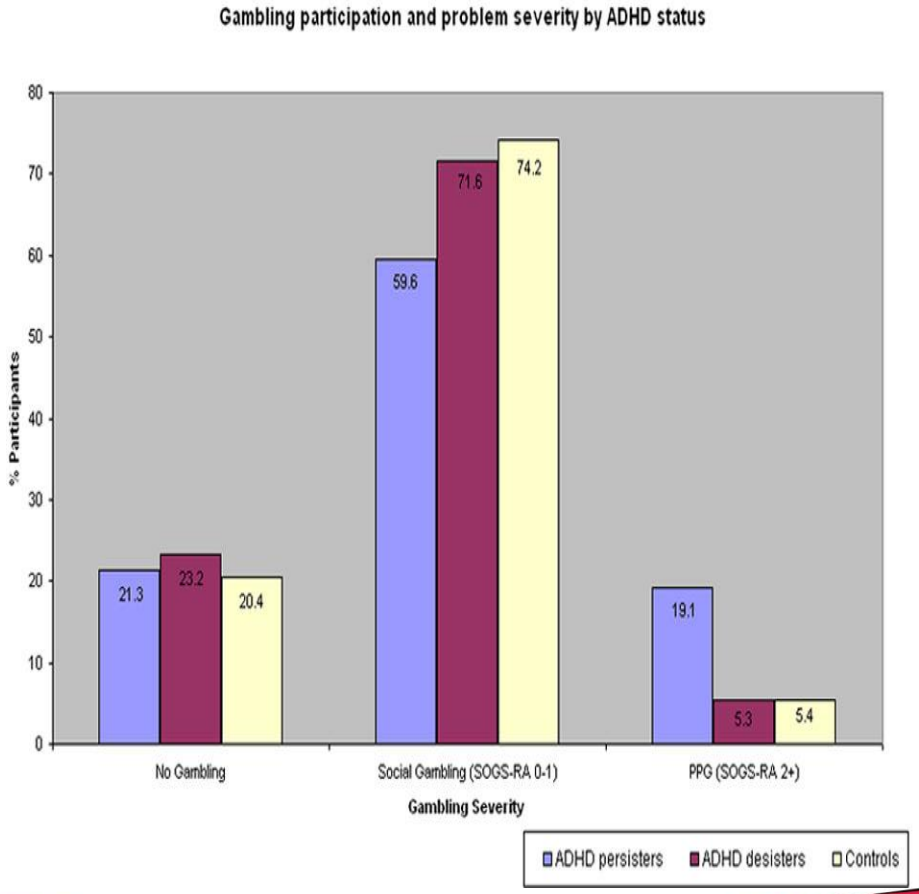
- Brain development lagged 3 years on average
- Prefrontal cortex development lagged up to 5 years



Problem Gambling and Persistence of ADHD

Breyer et al., 2009

- Minnesota youth



	ADHD	Control
Baseline (7-11)	318	144
Follow-up (18-24)	142	98

Marshmallow Experiment

The Maryland Center of
Excellence on Problem Gambling

Impulsivity and Problem Gambling

Pagnini, 2009

- 163 Kindergarten students rated by teachers on inattention, distractibility, hyperactivity on scale of 1-9
- Students interviewed 6 years later
  - Many reported gambling on bingo, cards, lottery, video poker, video games and sports
  - Every 1 point increase on kindergarten impulsivity rating correlated with a 25% jump in gambling by the 6th grade

Summary

- Teen brain development a work in progress
  - Motivation, Reward and Risk Taking
  - Lag in decision making (particularly in “hot” situations)
- Particularly vulnerable groups - ADHD
- Gaming/Gambling convergence
  - Hyperfocus – Locked in
  - Sleep deprivation and adolescent sleep patterns
  - Establishing long term patterns?

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Epigenetics, Stress Response, Generational Trauma

overactive amygdala
(emotional center)

underactive prefrontal cortex
(thinking center)

underactive anterior cingulate cortex
(attending center)

Epigenetics and Neuroplasticity

Environment can also heal epigenetic changes

- Healthy diet
- Nurturing environment
- Exercise
- Mindfulness and meditation
- Play and creativity

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BIOLOGY AND PHARMACOLOGY

Pharmacology

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Pharmacotherapy Studies with Pathological Gamblers

- What is being medicated?
  - Withdrawal symptoms
  - Emotional consequences of gambling
  - Craving
  - Blocking response
  - Affect triggers
  - Impulsivity

Pharmacotherapy Studies and Problem Gambling

MEDICATION FOR CO-MORBIDITY

- Affective disorders
- ADHD
- Anxiety disorder

Anti-depressants

Mood stabilizers

Anti-psychotics

Opioid antagonists

Glutamatergic Agents -N-acetyl cysteine

NMDA antagonists (memantine)

COMT inhibitors (tolcapone)

Pharmacotherapy Studies and Problem Gambling

Pharmacotherapy Studies and Problem Gambling: Issues for Real Practice

- Problems with compliance, particularly long-term
- Cost and lack of insurance coverage (i.e., naltrexone)
- Medication is an adjunct to behavioral treatment

What appears to work quite well?

Recent Literature Review

(Goslar et al., 2019)

Placebo controlled studies

- Opioid antagonists
- Mood stabilizers (particularly topiramate)
- Combined with cognitive intervention
- Lithium for GD plus bipolar

Anxiety/Depression/Obsession

SRI medications

Anxiolytics

CBT

URGE/ CRAVING

- Opioid antagonists
- Other medications
- Therapies

TREATMENT IMPLICATIONS:

- Assess biological vulnerability
- Assess comorbidity
- Cognitive assessment
- Enhance acceptance of vulnerabilities/health problems
- Pharmacotherapeutic Interventions

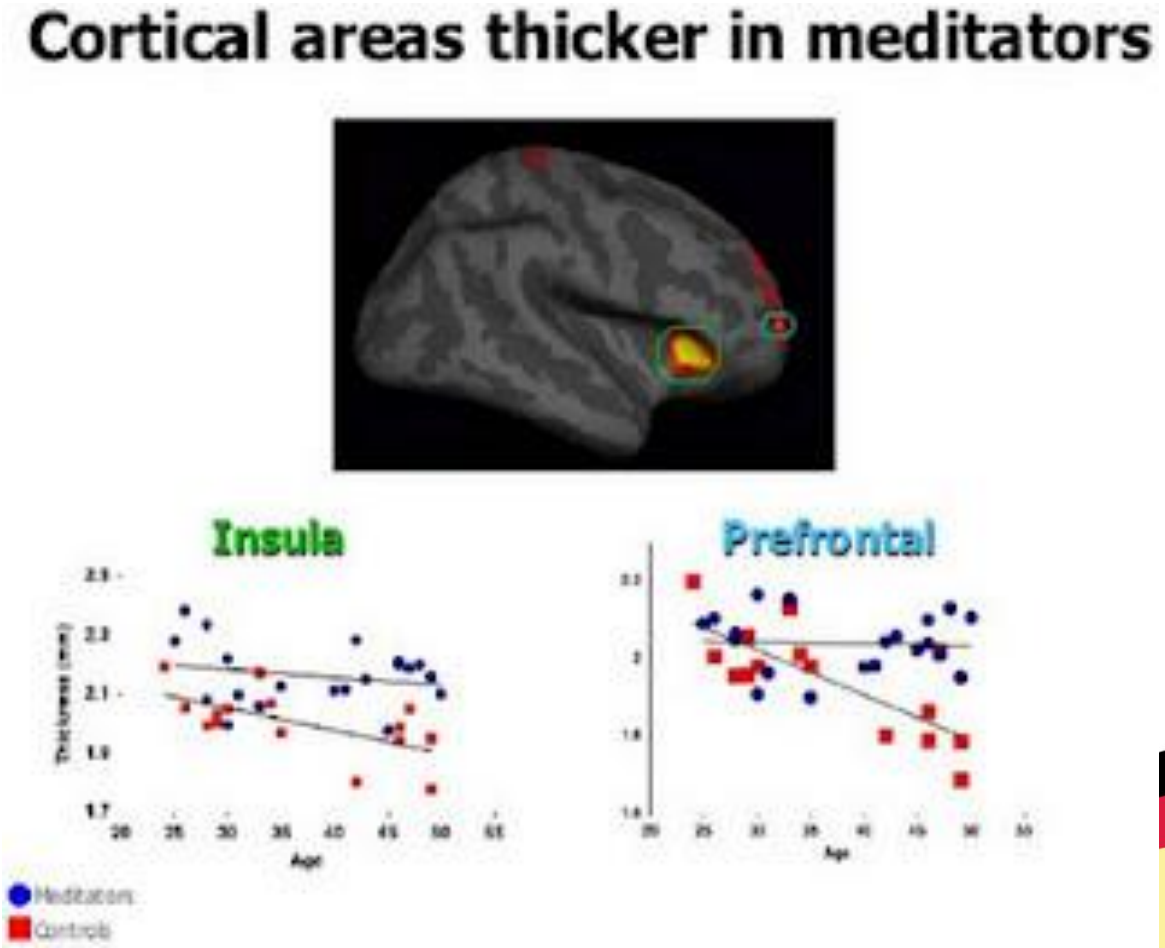
- **Understand how behavior and environment impact the brain!**
  - Address Social Determinants and Generational Factors
  - Diet
  - Exercise
  - Mindfulness/Active Relaxation/Stress Reduction

Mindfulness and Neuroplasticity

In meditators cortical areas were the same thickness
As nonpractitioner 20 years younger

Increased grey matter in brain areas that:
- allow shifting perspective
- allow empathy
- management of emotional distress

Decreased grey matter in amygdala
- emotional reactivity



Mindfulness

A consciousness discipline…The intentional cultivation of non-judgmental, non self-referential, caring attention

Modified from Jon Kabat-Zinn (1990)

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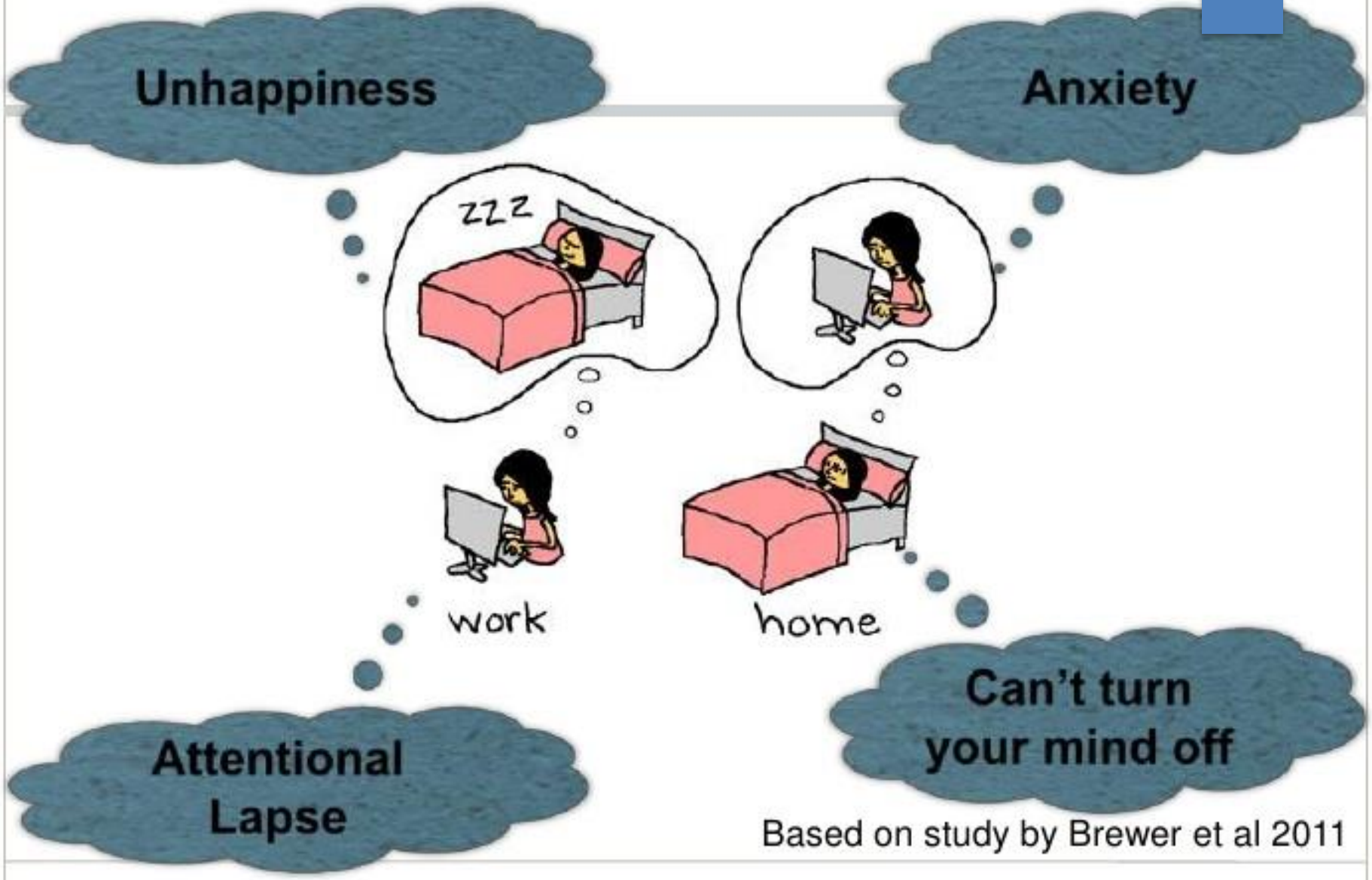
Mindfulness Based Interventions: Research Findings

- Jump to the conclusion
- MBI's as effective as Treatment as Usual (TAU) approaches such as CBT, Relapse Prevention etc.
- MBI's consistently show neurophysiological changes such as decreased stress responses and decreased response to painful stimuli
- Evidence that MBI's contribute to improvement on secondary outcome variables such as PTSD symptoms, emotional regulation, depression, anxiety
- Consistent recommendation that best outcomes may be from combination of TAU approaches and MBI's

Top Down or Bottom Up

- Top Down Modulation (Prefrontal Cortex, Orbitofrontal Cortex)
  - MBRP improves higher order executive control of typically automatic reactions to discomfort
- Bottom Up (Insula, amygdala)
  - Decreased reactivity to craving related stimuli or decreased reactivity to stressors

An Overactive Default Mode Network

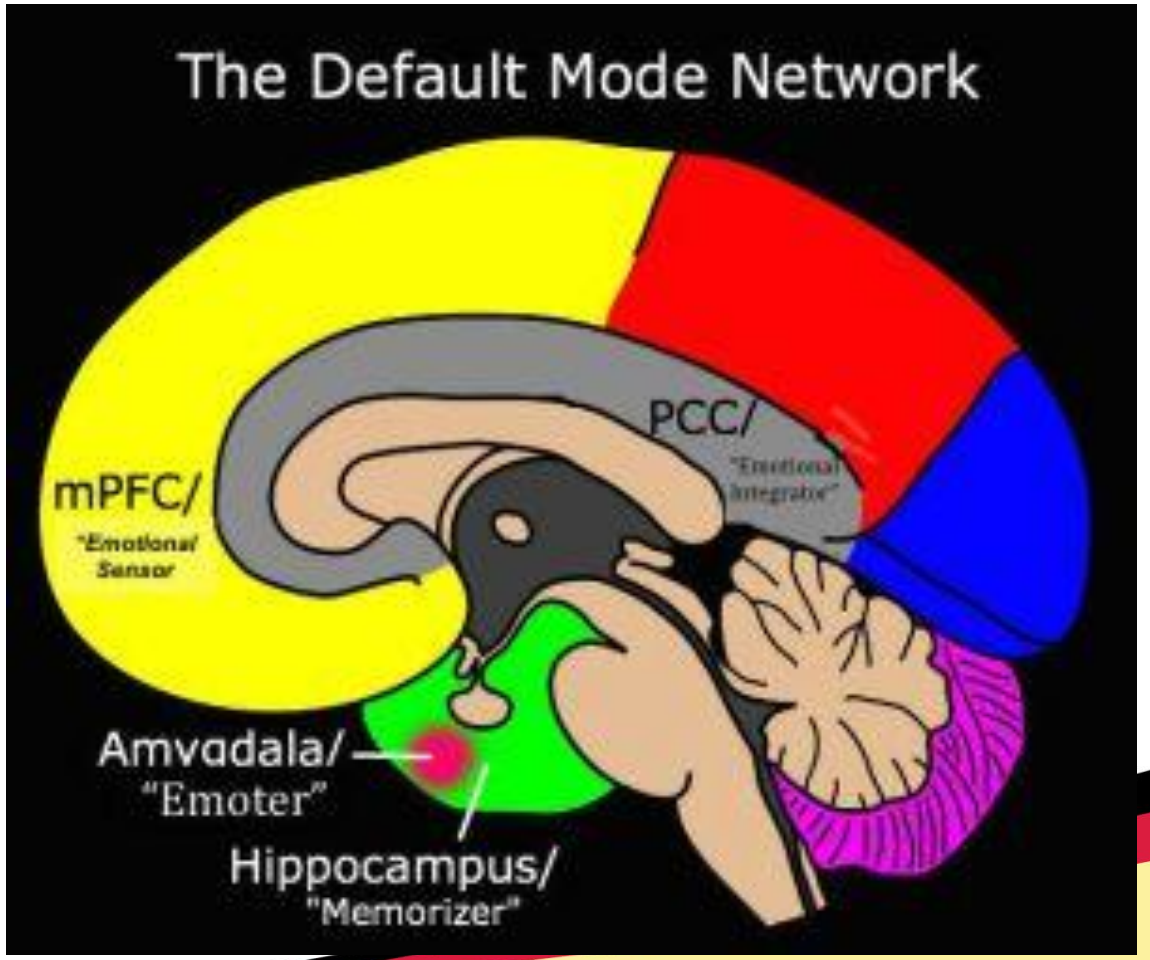


Default Mode Network

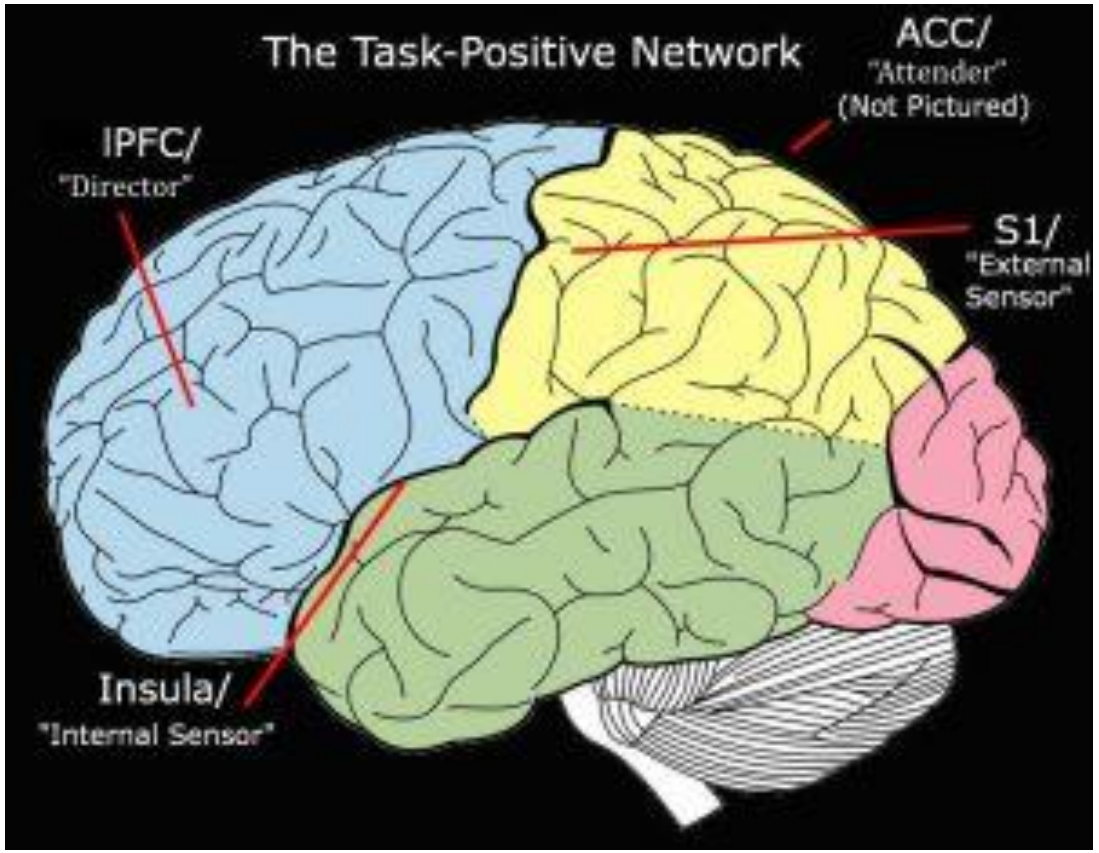
- Activated during mind wandering, day dreaming, ruminating, automatic pilot
- De-activated during mindfulness
- When our brain goes “off line”
- Me-orientation – stories about ourselves, our place in the world etc
- Overactive DMN related to greater risk for depression, anxiety, obsessionality PTSD, ADHD

DMN

- Medial (middle parts of brain)
- mPre-Frontal Cortex: processes social and emotional information, “Emotional Sensor”
- Posterior Cingulate Cortex: integrates self-perception and emotionally relevant memory retrieval, “Emotional Integrator”
- Amygdala: “Emoter”
- Hippocampus: “Memorizer”



Task Positive Network



- Lateral PreFrontal Cortex: Attentional direction, decision making, working memory, cognitive control, “Director”
- Anterior Cingulate Cortex: Directs attention focus, “Attender”
- Insula: Allows detection of internal states such as heart beat, feeling full bladder, intestines, “Internal Sensor”
- Somatosenory Cortex: Bodily sensation of touch, “External Sensor”

TPN Dysfunction and Addiction

- Abnormal functional connectivity of anterior cingulate cortex (attender) linked to impaired inhibitory control
- Decreased processing of external stimuli relative to internal
- Failure to suppress DMN during behavioral tasks
- Impaired communication between DMN, Salience Network and Executive Control Network

Going in Circles

Thich Nhat Hanh

O you who are going in circles,
please stop,
What are you doing it for?

"I cannot be without going,
Because I don't know where to go.
That's why I go in circles"

O you who are going in circles,
please stop

"But if I stop going,
I will stop being."

Going in Circles

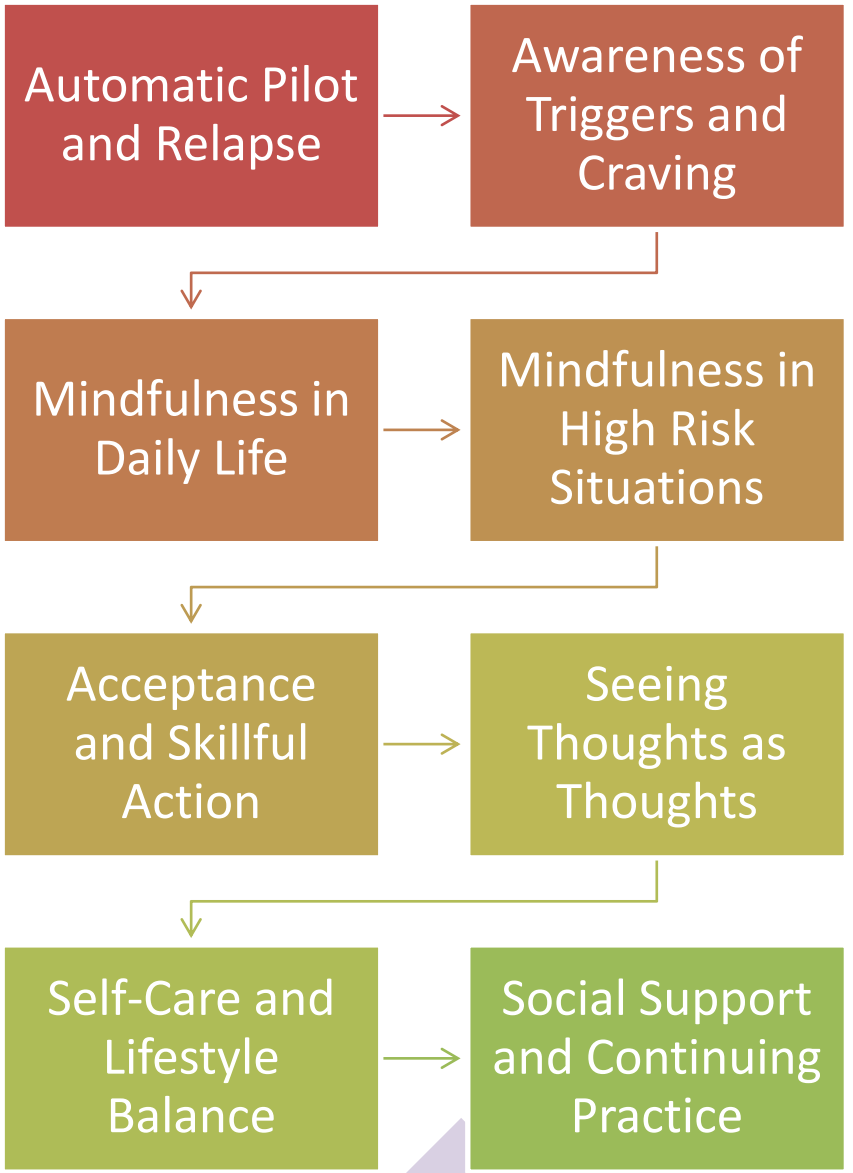
Thich Nhat Hanh

O my friend who is going in circles,
You are not one with
This crazy business of going in circles.
You may enjoy going,
But not going in circles

“Where can I go?”

Go where you can find your beloved,
Where you can find yourself.

Mindfulness Based Recovery Promotion (Bowen, Chawla & Marlatt)



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Mindfulness Based Recovery Promotion

- Attitude toward internal and external triggers
  - Curiosity
  - Investigation and exploration
  - Deep understanding
  - Acceptance
  - Tolerance
  - Nonjudgementalness
  - Non-Self Referential

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Turning off Auto Pilot

R –Recognize what is happening

A - Allow things to be as they are

I – Investigate with caring attention

N – Nurture

S – Stop

O – Observe

B – Breathe

E – Expand

R - Respond

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A Gold Star for Noticing

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Biased Brains

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Negativity Bias

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Definitions

Empathy

"An accurate understanding of the [another's] world as seen from the inside. To sense [another person's] world as if it were your own." - Carl Rogers -

Loving-Kindness

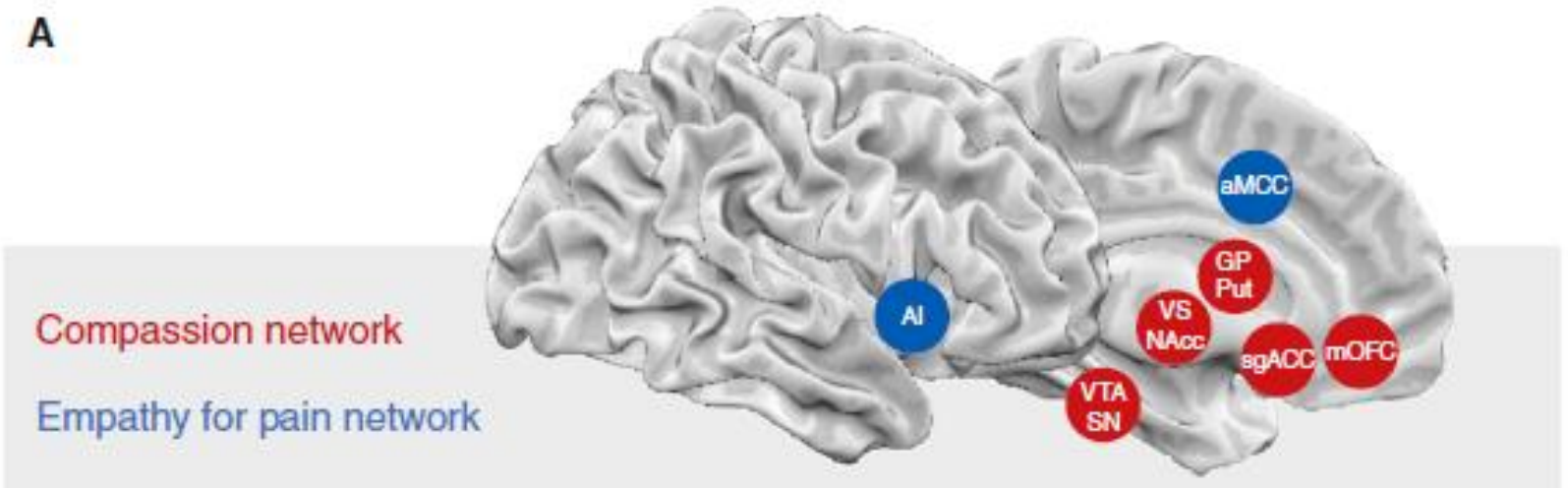
The wish that all sentient beings may be happy. – Dalai Lama -

Compassion

The wish that all sentient beings may be free from suffering. – Dalai Lama –

Deep awareness of the suffering of oneself and other living beings,
coupled with the wish and effort to alleviate it. – Paul Gilbert –

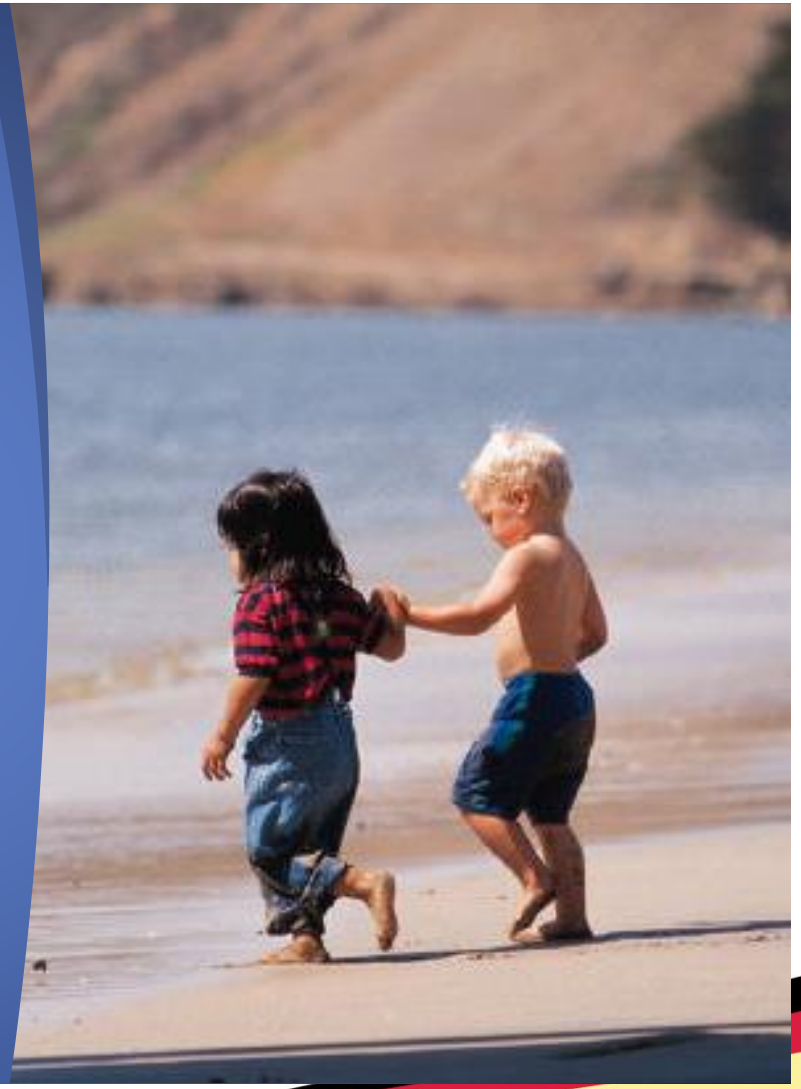
Empathy & Compassion
Singer, T & Klimecki, O.M.



Add Friendliness and Kindness

- As if sitting with my dearest friend
- As if holding an injured pet or hurt child

- Adding gentleness, softness, warmth, strength



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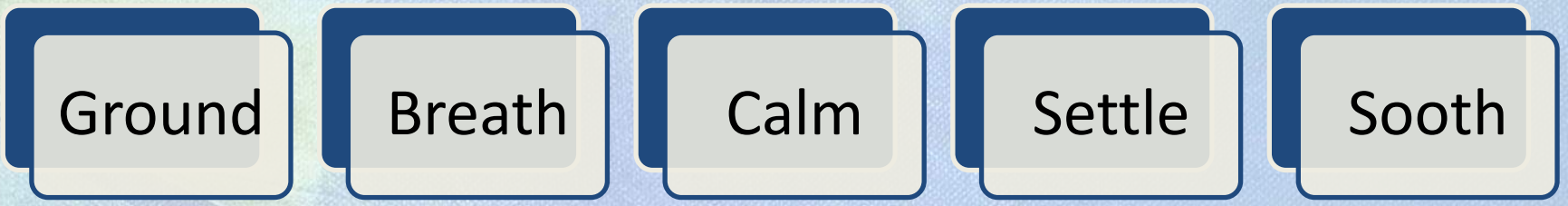
Compassion and the Holding Environment



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Three Components of Compassion toward the Self (K. Neff)

One: Mindfulness

- Notice Suffering
- Lean toward pain in kind, non-judgmental way. Bring curiosity
- Opposite of avoidance or over-identification

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Three Components of Compassion Toward the Self

Two: Common Humanity

- Our own experience of suffering and imperfection is universal
- Opposite of isolation
- Not a way of minimizing
- Other people have this experience, I am not alone
- Nothing is wrong with me

Three Components of Compassion Toward the Self

Three: Self-Kindness

- How would we treat a close friend
- Alleviation of suffering
- Actively soothing and comforting
- Opposite of self-judgment

Addiction and Self-Compassion

- Misguided self-compassion
- Mindlessness vs. Mindfulness
  - Wanting to ease pain and suffering by avoidance or pushing pain away
- Feeling Good vs. Self-Kindness
  - Wanting to feel good (pleasure is motivating)
  - Wanting to treat myself well
- Disconnection vs. Common Humanity
  - We all want to feel well and not suffer

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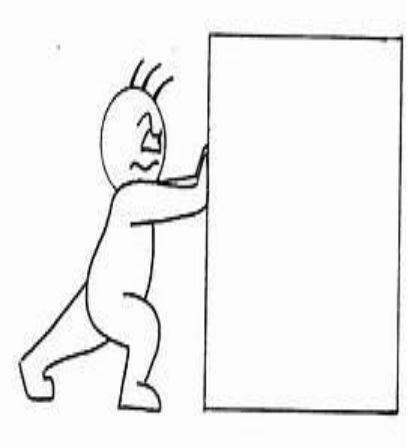
Coping with the Unwanted



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What I resist, persists

- Suffering = Pain X Resistance

What we Feel, We can Heal

Feeling + Self-Compassion

(or Pain + Kindness)

= Relief from Suffering

How to Manage

Not emotions we need to get rid of, but look at our response

Response can be helpful or unhelpful

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Awareness

- Mindfulness of emotions: Name and acknowledge
- Create some space
- Non Self-referential
- Let go of story – Embodied experience

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Creating Balance in Life

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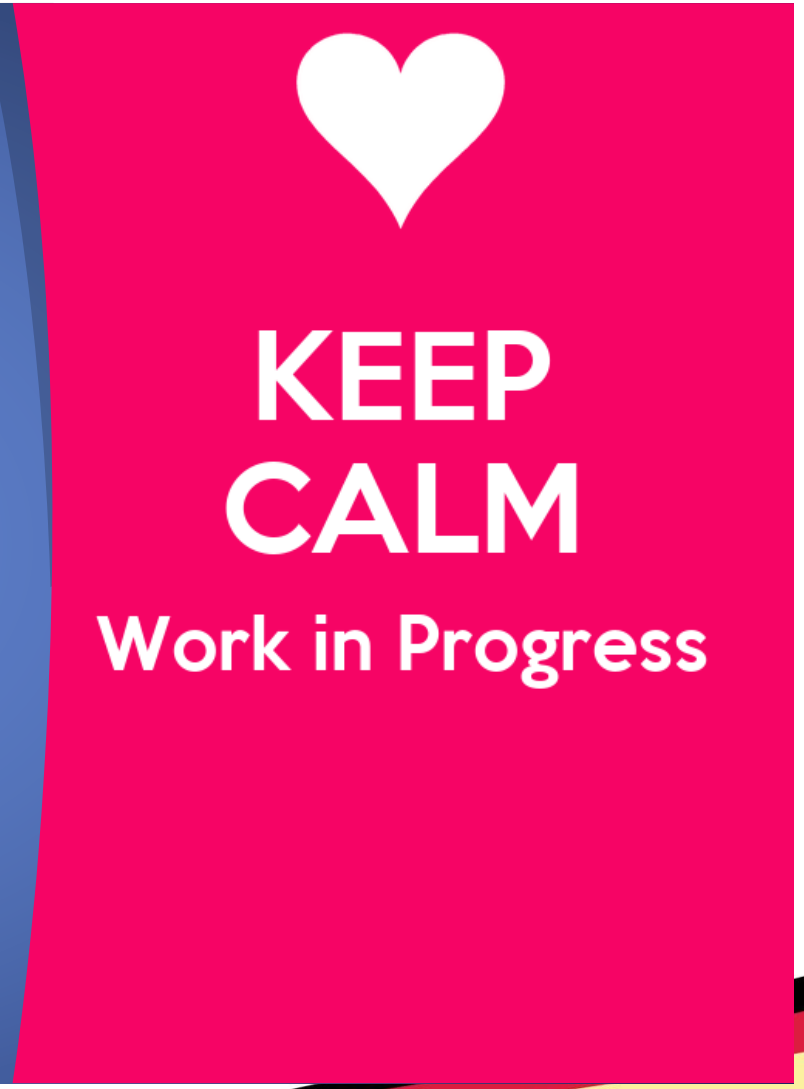
Equanimity means being with pain and pleasure, joy and sorrow in such a way that our hearts are fully open and also whole, intact.

We can recognize what is true, even if painful, and also know peace.

Sharon Salzburg



Cultivating Sustaining (wholesome) Emotions

- Delight/Playfulness
- Gratitude
- Generosity
- Kindness/Friendliness
- Joy/aliveness
- Awe/Wonder
- Happiness/contentment

Self-Caring Intentions

(Lange, Rugle 2016)

May I be open and receptive

May I surrender to new possibilities

May I be safe and secure and prepared for new growth

May I be funny and full of life

May I be enthusiastic and excited

May I be happy and healthy because of my self care

May I let go of the past and pain

May I have wonderfully supportive people in my life

May I recognize and appreciate the uniqueness of others

May I practice gratitude and forgiveness

May I take care of myself

Questions

Sign up

Thank You for All That You Are

"If we can be fearless, to be with our pain, it turns…When we look at it, when we take it in our hands when we can just be with it and keep breathing then it turns. It turns to reveal its other face, and the other face of our pain for the world is our love for the world, our absolute inseparable connectedness with all life."

Joanna Macy, Environmental Activist

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References

Barton, K. R., Yazdani, Y., Ayer, N., Kalvapalle, S., Brown, S., Stapleton, J., Brown, D. G., & Harrigan, K. A. (2017). The effect of losses disguised as wins and near misses in electronic gaming machines: A systematic review. *Journal of Gambling Studies, 33,* 1241–1260.

Buck, S.A., Tonnegrossa, M.M., Logan, R.W., Freyberg, Z. (2020). Roles of dopamine and glutamate co-release in the nucleus accombens in mediating actions of drugs of abuse. *The FEBS J.*

Clark, L.., Lawrence, A. J., Astley-Jones, F., Gray, N. (2009). Gambling near-misses enhance motivation to gamble and recruit win related brain circuitry. *Neuron,* 61, 481-490.

Clark, L., Studer, B., Bauss, J., Tranel, D., Bechara, A. (2014). Damage to insula abolishes cognitive distortions during simulated gambling. *Proc Natl Acad Sci USA,* 111, 6098-6103.

Derevensky, J. (2020). The preventing and treatment of gambling disorders: Some art, some science. In S. Sussman (Ed.). *Cambridge handbook of substance and behavioral addictions.* Cambridge University Press.

Floros, G. D. (2018). Gambling disorder in adolescents: Prevalence, new developments, and treatment challenges. *Adolescent Health, Medicine and Therapeutics, 9,* 43–51.

Franklin, A. J. (2004). *From brotherhood to manhood: How Black men rescue their relationships and dreams from the invisibility syndrome.* Wiley.

Goslar, M., Leibetseder, M., Muench, H. M., Hofmann, S. G., & Laireiter, A.-R. (2019). Pharmacological treatments for disordered gambling: A meta-analysis. *Journal of Gambling Studies, 35*(2), 415–445.

Grant, J. E., Chamberlain, S. R., Schreiber, L. R., & Odlaug, B. L. (2012). Gender-related clinical and neurocognitive differences in individuals seeking treatment for pathological gambling. *Journal of Psychiatric Research, 46*(9), 1206–1211.

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References

Grant, J., & Potenza, M. N. (2006). Sexual orientation of men with pathological gambling: Prevalence and psychiatric comorbidity in a treatment seeking sample. *Comprehensive Psychiatry,* 515–518.

Groen, Y., Gaastra, G. F., Lewis-Evan G., & Tucha, O. (2013). Risky behavior in gambling tasks in individuals with ADHD: A systematic literature review. *PLoS one.*

Habib, R. & Dixon, M.R. (2010). Neurobehavioral evidence for the "near miss" effect in pathological gambling. *J Exp Anal Behav,*93, 313-328.

Haskins, D. G. (2019). Cultural Attunement and Disordered Gambling Prevention, Treatment and Wellness. MOSAIC Consulting and Counseling Services, LLC.

Hogan, M. (2013). *Four skills of cultural diversity competence: A process for understanding and practice* (4th ed.). Thomson-Brooks/Cole.

Holtgraves, T. (2009). Gambling, gambling activities, and problem gambling. *Psychology of Addictive Behaviors, 23*(2), 295–302.

King, D. L., & Delfabbro, P. H. (2018). Predatory monetization schemes in video games (e.g. 'loot boxes') and Internet gaming disorder. *Addiction, 113*(11), 1967–1969.

Lopez-Gonzalez, H., Estevez, A., & Griffiths, M. (2018). Internet-based structural characteristics of sports betting and problem gambling severity: Is there a relationship? *International Journal of Mental Health and Addiction,* 1–14.

Oakes, E. K. (2011). Health care disparities and training in culturally competent mental health counseling: A review of the literatur[illegible] implications for research. *International Journal of Humanities and Social Science, 1*(17), 46–57.

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References

Petry, N. M., Steinberg, K. L., & Women's Problem Gambling Research Center. (2005). Childhood maltreatment in male and female treatment-seeking pathological gamblers. *Psychology of Addictive Behaviors, 19*(2), 226–229.

Peters, J., Vargo, T, Weinstein, D., et al. (2020) Dopamine and risky decision-making in gambling disorder. *Eneuro.*

Pew Research Center. (2018). Teens, social media, and technology. Washington, DC.

Rugle, L. (1993) Initial thoughts on viewing pathological gambling from a physiological and intrapsychic perspective. *J Gambling Studies,* 9, 3-16

Rugle, L & Melamed, L. (1993). Neuropsychological assessment of attention problems in pathological gamblers. *J Nervous and Mental Disease,* 181, 107-112.

Slutske, W. S., Deutsch, A. R., Richmond-Rakerd, L. S., Chernyavskiy, P., Statham, D. J., & Martin, N. G. (2014). Test of a potential causal influence of earlier age of gambling initiation on gambling involvement and disorder: A multi-level discordant twin design. *Psychology of Addictive Behaviors, 28,* 1177–1189.

Slutske, W. S., Zhu, G., Meier, M. H., & Martin, N. G. (2010). Genetic and environmental influences on disordered gambling in men and women. *Archives of General Psychiatry, 67,* 624–630.

Steinberg L. (2004). Risk taking in adolescence: what changes and why. *Ann NY Acad Sci,* 1021, 51-8.

Tenenbaum, R. B., Musser, E. D., Morris, S., Ward, A. R., Raiker, J. S., Coles, E. K., & Pelham, W. E., Jr. (2019). Response inhibition, response execution, and emotion regulation among children with attention-deficit/hyperactivity disorder. *Journal of Abnormal Child Psychol* *47*(4), 589–603.

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References

Tom, S. M., Fox, C. R., Trepel, C., & Poldrack, R. A. (2007, January 26). The neural basis of loss aversion in decision-making under risk. *Science, 315*(5811), 515–518.

Twenga, J. M. (2018, June 29). Gaming disorder is only a symptom of a much larger problem. *Washington Post.*

Welte, J. W., Barnes, G. M., Tidwell, M.-C. O., & Wieczorek, W. F. (2017). Predictors of problem gambling in the U.S. *Journal of Gambling Studies, 33*(2), 327–342.

Zendle, D., & Cairns, P. (2018). Video game loot boxes are linked to problem gambling: Results of a large-scale survey. *PLoS ONE, 13*(11), e0206767.

Zois, E., Kiefer, K., Lemenager, T., Vollstädt-Klein, S., Mann, K., & Fauth-Bühler, M. (2017). Frontal cortex gray matter volume alterations in pathological gambling occur independently from substance use disorder. *Addiction Biology, 22*(3), 864–872.

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