

# THE POWER OF PLAY

ITS ROLE IN DEVELOPING THE NERVOUS SYSTEM AND  
FACILITATING SELF REGULATION

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## Goals

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- Introduce the biological underpinnings of play.
- Explain how play shapes the brain and nervous system.
- Describe the relationship between nervous system development and self-regulation.
- Discuss how play is essential across the life course for social and emotional well-being.



## Play

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- Self-chosen and self-directed
- Intrinsically motivated
- Imaginative
- Conducted in an active, alert, but relatively non-stressed frame of mind
- Guided by mental rules
- Reciprocal between partners
- SNS arousal in context of safety
  - Healing if arousal has previously been associated with pain and fear



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## Flow (Csikszentmihalyi, 1990)

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- Mental state of play
- Attention is attuned to the activity itself
- Reduced consciousness of self and time
- Mind is wrapped up in the play and impervious to outside distractions
- Ideal for creativity and learning new skills (Gray, 2013)

## Play Takes Us to Our “Growing Edge”

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- Allows us to look at experiences from new perspectives
- Dynamic and adaptive process—confront new information & figure out what to do
- Play exposes us to variations in actions that lead to unpredictable outcomes
- Allows us to test boundaries and practice new behaviors
- Exists in intersubjective space between participants
- Provides psychological distance from content

**PLAY ALLOWS US SAFE  
DISTANCE AS WE WORK ON  
WHAT'S CLOSE TO OUR  
HEARTS.**

Fred Rogers



## Primary Emotional Systems (Panksepp, 1998, 2009)

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Seeking (Expectancy)	
Activated when we are <b>OUT</b> of connection:	Activated when we are <b>IN</b> connection:
Rage (anger) Fear (anxiety) Panic/Grief (separation distress)	Care (nurturance) Lust (sexual excitement) Play (social joy)

Kestly, T. (2014). *The interpersonal neurobiology of play: Brain-building interventions for emotional well-being*. New York, NY: W. Norton.



## Play & Emotions

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- Positive affect, energetic arousal, unconditional positive regard
- Novelty and excitement generate dopamine, creating feelings of well-being
- Mental/emotional tensions may arise (negative affect)
  - Coordination of social interaction
  - Accommodation of new ideas
  - Difficult psychological material
- Since play is self-chosen, tensions are manageable
  - If tension becomes distress, player can quit or change the play to relieve tension
- If activity becomes compulsive & continues despite lots of distress, it's no longer play



## Brain Basics

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- Embodied brain
  - Central and peripheral nervous systems have bidirectional functioning
  - Brain functions distributed throughout body (Badenoch, 2011; Siegel, 2010)
- Brain stem, limbic system, neocortex
  - Earliest structures are embedded in and inform later ones
  - Top layers cannot function well without development of bottom layers (Perry, 1997)
  - Brain functions best when there's balance—bottom to top and right to left (Siegel, 2010 & 2012)
- Humans have neuroplasticity across life course
- Learning and social connections are impaired outside of zone of optimal arousal

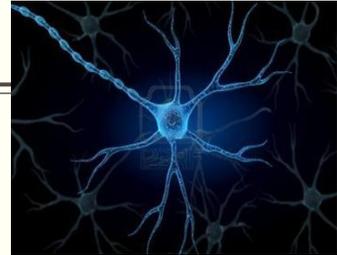


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## Autonomic Nervous System

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- Sympathetic branch (up-regulating)
  - Excites (fight or flight)
  - Energy to deal with challenges outside of body
  - Dominant for expression of terror, rage, excitement & elation
- Parasympathetic branch (down-regulating)
  - Inhibits (freeze)
  - Growth & restoration
  - Dominant for expression of shame, disgust, hopelessness, despair & profound detachment
  - Calm approaches to social interactions



The brain and nervous system like balance and sameness.

## Attachment and Nervous System Functioning (Schore, 2003)

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- Environmental influences & caregiving experiences create preference for automatic use of one branch over the other
- Over-utilized branch becomes dominant but responses no longer appropriate to the situation
- Two branches no longer work well together—has profound effect on creation of attachment styles
  - Secure (balanced)
  - Insecure avoidant (parasympathetic)
  - Insecure resistant/ambivalent (sympathetic)
  - Disorganized (rapid shifting between branches or simultaneous hyper-activation)

## Interpersonal Neurobiology (Stern, 1977, 2002)

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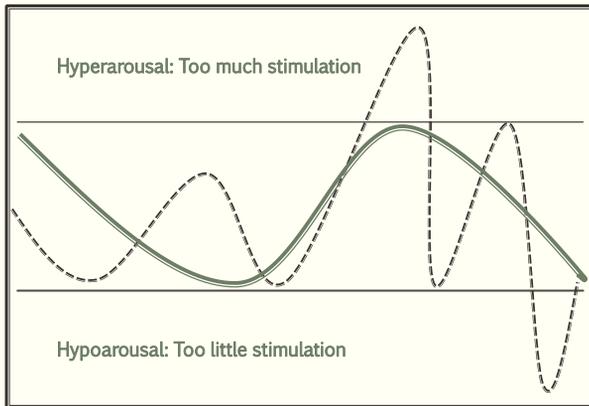
- Established in first 6 months of life
- Serves as prototype of later interpersonal exchanges
- Established through effective parent-child co-regulation
  - Stimulation/joy balanced with rest/comfort
  - Amplify positive emotion and modulate negative emotion
  - Together, test the limits of what's optimal, doing repairs as needed to come back to optimal range
- Mindsight—caregivers reflect an understanding of child's signals and physical and emotional needs (Siegel, 1999)
- **Too much & too little stimulation are important to experience**
  - Opportunities to build trust and coping skills
  - Teaches infant to adapt to on-going and surprising stimuli



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## Window of Tolerance (Siegel, 1999)

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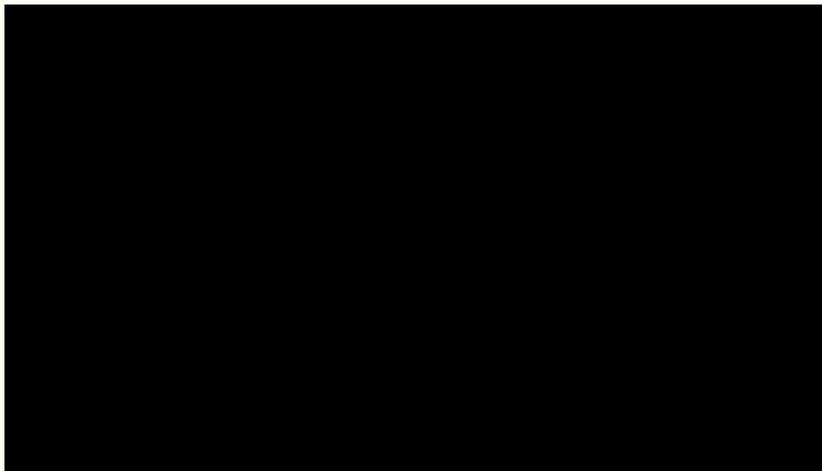
Signals: smiling, gazing, touching listening, laughing, vocalizing, moving

Kestly, T. (2014). *The interpersonal neurobiology of play: Brain-building interventions for emotional well-being*. New York, NY: W. W. Norton.



## Video: The Still Face Procedure (Tronick, 1975)

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## Caregivers Register and Reciprocate Feelings

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- Orbitofrontal neurons fire in response to caregiver's face (Schore, 1994)
- Mirror neurons create reciprocal arousal
- Learn to understand and regulate emotions
- Mind, behavior, perception, and action are wholly integrated (Jonassen & Land, 2012)
- Right amount of cortisol is protective—too much associated with impairments to memory, attention, learning, behavior, and peer relationships
- Boredom = activation of the amygdala = stress state

## The Social Synapse (Cozolino, 2002)

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Energy dancing around in the social synapse connects us and changes our brains.

We can feel it; it's palpable. But, communication is implicit and occurs below conscious awareness.

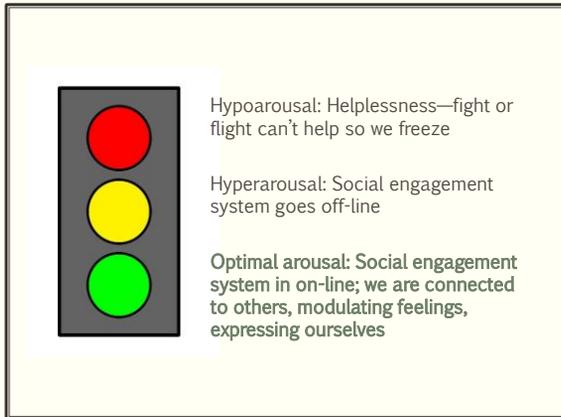


Mirror neurons allow us to experience our social partner—vicarious experience is felt as self experience.

Our histories (pain and relational success) influence how we receive energy coming from others.

### RESONANCE

## Polyvagal Theory (Porges, 2011)



*Kestly, T. (2014). The interpersonal neurobiology of play: Brain-building interventions for emotional well-being. New York, NY: W. Norton.*

- System shifts rapidly from one state to another for protection
- Parasympathetic
  - Ventral vagal: calming, braking
  - Dorsal vagal: freezing
- **Play (green light)—mobilizes SNS without losing social connections**

## Play & Self-Regulation

- Play modifies the neural circuitry that regulates emotional responses
- Allows children to scaffold learning for themselves—and regulate nervous system—by choosing activities that fit their needs
- Desire to stay engaged in play forces acceptance of restrictions on behavior and emotion that would not ordinarily be accepted (Vygotsky, 1978)
- Social pretend play especially powerful
  - Players have to observe and restrain themselves
  - Inhibit behaviors that are not part of the role
  - Plan and coordinate the play
  - Practice socially desirable behaviors



## Play & Emotion-Regulation (e.g., Carlson & Beck, 2009)

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- Develops frontal lobe inhibitory circuits
- Builds regulatory circuitry through arousal/calm cycle
- Affords psychological distance from content—top down control over impulses
- Self-dosing of moderate degrees of fear & dealing with the unexpected
- Tests boundaries—expands window of tolerance for strong emotions
- Practice modulating nervous system w/natural anti-stress effects (release of strong opioids)
- Allows material stored in the right brain to bubble up

## Play & Executive Functioning (e.g., Herwig, 2009; Kelly & Hammond, 2011)

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- Making, following, altering plans
- Adjusting to new circumstances & regulating behavior
- Controlling and focusing attention
- Inhibiting & controlling impulses
- Considering new information in decision making
- Solving problems
- Delaying gratification
- Developing private speech



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## Play Across the Life Course

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- Free play opportunities has been declining continually since 1955 (Gray, 2011)
  - Media
  - Unsafe neighborhoods
  - Less contact with extended family
- Quality of play has declined too (Russ & Dillon, 2011)
- Declines in play correspond with declines in mental health and well-being
- **Abundant happy social play will allow children to “thrive by five”**
  - Happier, more stress resistant
  - More productive citizens

PLAY!



“We don’t stop playing because we grow old; we grow old because we stop playing.”—George Bernard Shaw

“Almost all creativity involves purposeful play.”—Abraham Maslow

“The creation of something new is not accomplished by the intellect but by the play instinct.”—Carl Jung

“Play is the highest form of research.”—Albert Einstein

“A child’s play is not simply a reproduction of what he has experienced, but a creative reworking of the impressions he has acquired.”—Lev Vygotsky