

# The Development of Self-Regulation

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redefine THE POSSIBLE.



## Duckworth & Seligman



- In 2005, Angela Duckworth and Martin Seligman reported that self-discipline is a stronger predictor of school performance than IQ: not just in terms of grades, but even such things as school attendance, hours spent doing homework, or the amount of time spent watching TV
- The average age of the children in Duckworth and Seligman's study was 13.4 years: How did these eighth-graders arrive at this point?

## Mischel

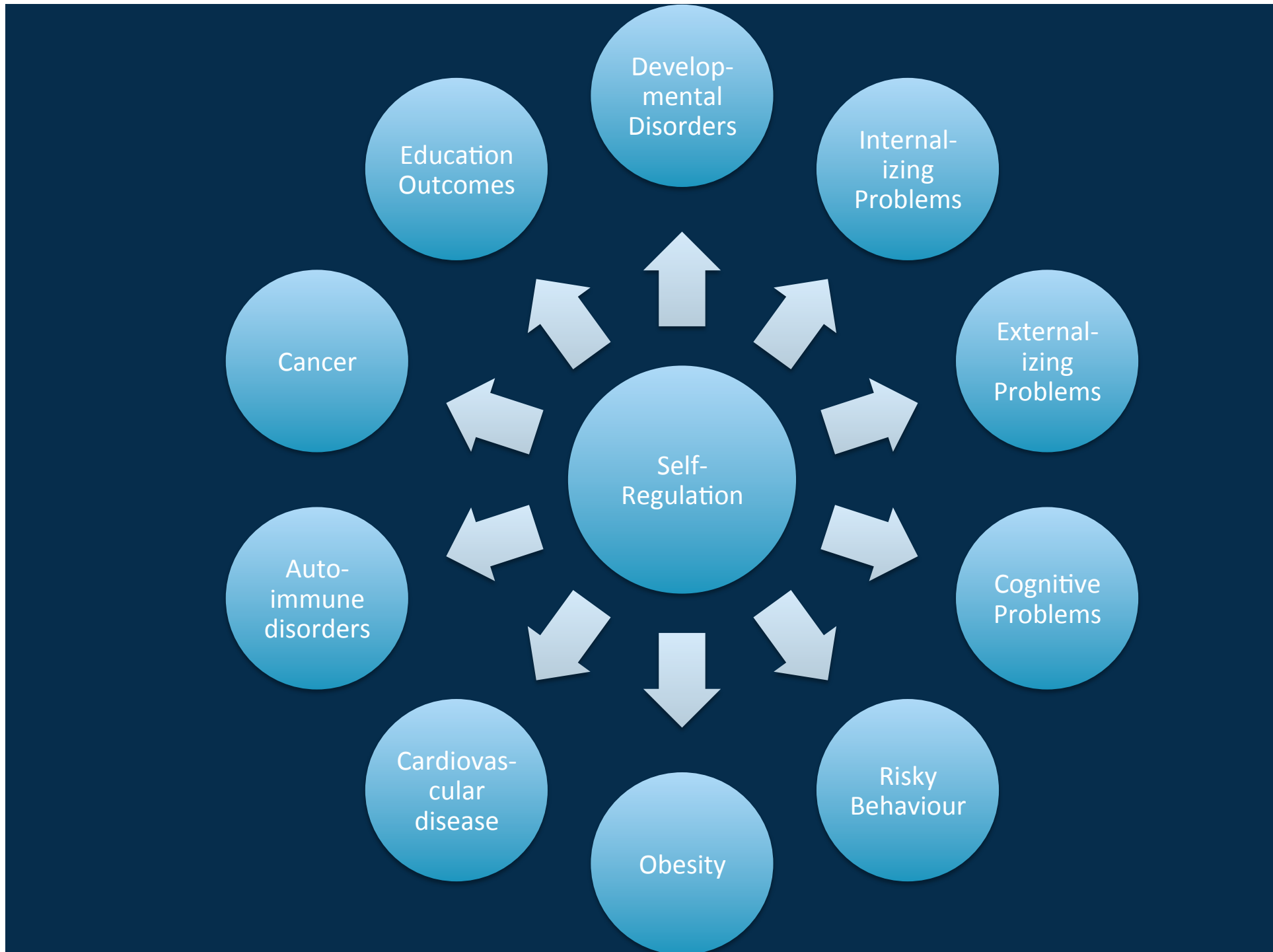


- Forty years ago, Mischel developed his famous ‘marshmallow test’, in which a child is told he can have one marshmallow now or several if he waits until the experimenter comes back in 15 minutes
- Around 30% of 4 year-olds can wait
- The children who could wait scored an average of 210 points better on their college entrance exams
- Not just academic achievement that’s at stake: also predicts anti-social behavior and susceptibility to drugs

## The Explosion of Research on Self-Regulation



- Over the past decade there's been an explosion of interest in self-regulation in regards to a broad range of mental and physical problems
- Each is thought to have unique biological antecedents and/or environmental contingencies, and to follow a different developmental pathway
- Even within each disorder there is thought to be enormous variability in the pathways
- But the key in each is thought to be a problem in self-regulation, starting early in the child's life



## What is Self-Regulation?



- Self-regulation is defined as “regulation of the self by the self” (Baumeister & Vohs 2006)
- But this covers everything, and it lands us on a slippery slope: i.e., with the question, how does the self do this, and what regulates the self so that it can regulate the self?
- Until we can identify what uniquely characterizes self-regulation we won’ t be in a position to explain what this has to do with such outcomes; nor what we can do to enhance a child’ s ability to self-regulate

## The Long History of Self-Regulation



- Plato: child's early experiences must be tailored to his temperament if he is to acquire self-control; only with self-control will he be able to enjoy *eudaimonia*
- According to orthodox Christian doctrine, prior to the Fall Adam and Eve enjoyed perfect humoral balance, with reason in full control of their emotions, and thus, immunity from disease
- By succumbing to Devil's temptation, humanity's reason weakened and appetites strengthened

## Classical View of Self-Regulation



- Self-regulation is basically self-control
- That is, inhibiting impulses: physical (e.g., drives, appetites and emotions), behavioral (actions), and mental (thoughts, beliefs and desires)
- The key idea is that self-control refers to the strength required to resist an impulse, distraction, or temptation
- Children who do poorly, for example, at delay of gratification tests have a weak ‘muscle’

## A Change in Attitudes



- Is the situation comparable to medieval views of madness as a punishment visited on the sinful?
- That is, children with poor self-regulation are seen in negative terms, e.g. as having weak self-control
- We need a different understanding of why it is so difficult for some children to stay calmly focused and alert

# Five Levels of Self-Regulation



1. Biology (Temperament)
2. Emotion-regulation
3. Cognitive: Executive Functions
  - Sustained attention
  - Attention switching
  - Inhibit impulses
  - Deal with frustration, delay, distractions
4. Social: Acquisition of normative behaviors (e.g., language, social conventions)
5. Moral: development of internalized standards

# The Bio-mechanics of Arousal Regulation



- *Arousal regulation* can best be understood in terms of the countervailing forces of SNS activation (e.g., adrenalin) and PNS inhibition (e.g., cortisol): in effect, putting your foot on the gas or the brakes in order to attend to a particular activity
- There is a continuum of arousal, ranging from sleep to being flooded; and how much recovery is necessary or how much activation is needed for any particular task is going to vary from child to child and situation to situation

# Stages of Arousal



## Inhibition



1. Asleep
2. Drowsy
3. Hypoalert
4. Calmly focused and Alert
5. Hyperalert



6. Flooded

## Activation

## Driving Analogy



- Helpful for understanding the subtle adjustments in arousal involved in regulating attention
- If goal is to maintain a speed of 100 km/hr constantly pressing and easing up on the gas depending on the state of the road, incline, wind speed etc.
- Furthermore, driving involves constant changes in speed limits or traffic conditions, so learning how to drive involves learning how to smoothly adjust the amount of gas or braking required for the current conditions

# Optimal Regulation



- Children vary considerably in their capacity for optimal regulation, by which is meant “the capacity to make both gradual and rapid state changes across the arousal continuum (that are appropriate to context), recover back to baseline, and modulate the highs and lows of energy within a given state”
- Some children are constantly pushing too hard on the gas or the brake pedal, jumping erratically from one level to another

## Allostatic Load Conditions



- If young child subjected to too much stress, the result can be an allostatic load condition:
  - Sudden transitions between energy states
  - prolonged over-activation of SNS and/or PNS
  - inappropriate activation of SNS or PNS (i.e., in situations not warranting a heightened stress response)
  - diminished ability to return to baseline after activation of the stress response

## Consequence of Over-Exposure to Stress



- Disrupts development of the brain (HPA pathway)
- Child becomes chronically hypoaroused or hyperaroused
- Child has difficulty staying focused and alert, which is the ideal state for learning to occur

## Chronic Hypoarousal



- Might be because of problems reaching a threshold to activate awareness of a stimulus
- Or because this serves as a defensive mechanism because child finds certain stimuli or experiences overwhelming;
- Or because child has difficulty differentiating internal signals
- Child finds it soothing to be in a hypoaroused state

## Chronic Hyperarousal



- Child might be highly sensitive to certain kinds of stimulus (internal or external)
- He might be sensory craving and need to maintain a certain level of activity in order to feel fully aware of his body or to register certain kinds of sensation
- He might be experiencing too many stressors and his parasympathetic system is in constant overdrive

## Down-regulating and Up-regulating a Child



- Caregiver's regulating behaviors a function of the situation and her reading of the baby's signals
- E.g., if it is time for social interaction and the child is listless and nonresponsive she might up-regulate the baby by heightening the intensity of her smiles, vocalizations, gestures
- If it is bedtime and the child is hyperaroused, with jerky movements or a wide-eyed stare, she might seek to down-regulate him via bath-time, story time, singing a lullaby, stroking

# Sleeping



- Sleeping is very much a self-regulating behavior, a critical way of restoring bodily functions, and an important part of the process of learning how to self-regulate involves learning how to register the visceral signals of fatigue and the need to lie down and restore
- But a child who sleeps excessively as a mechanism for avoiding stress needs to be up-regulated, which means addressing the causes of the child's distress

# Self-regulation and Inhibitory Control



- Marked tendency to equate problems in self-regulation with poor inhibitory control
- To be sure, some children find it much more difficult to control their impulses
- The big question is why

## Individual Differences



- Whatever a child is doing demands fuel, and the size of that cost will vary according to the activity, the situation, and most importantly, the child
- Two children might have to expend very different amounts of energy – be at very different points on the arousal continuum – in order to engage in the same activity
- This can be due to biological, social, and/or environmental causes

## Sitting in Class



Suppose we are dealing with a child who finds sitting in a classroom very demanding, for different reasons:

- Maybe he finds the visual and auditory stimuli distracting and he has to work hard to filter this out in order to pay attention to his teacher
- Or he finds the hard seat uncomfortable and it is taxing for him to sit still for too long

## Why problems in self-regulation lead to entrenched problems



Suppose this child expends 40 I/100 km in order to master some new material while the child sitting next to him only expends 20 I/100 km

- It is no surprise, given the tight interconnection between arousal and focus that the attention span of the first child will be much less than that of the second
- But if the pace of the lessons is patterned on the attention span of the latter child, then the former is going to fall further and further behind

## Energy Depletion Studies



- Baumeister has shown in a number of experiments that attention to a task significantly depletes energy reserves
- The greater the energy consumed by a task the greater the likelihood that child will shut down to try to restore energy (churn out adrenaline to try to meet the demands of the situation), both states marked by decreased attentional capacity

## Source of the Problem



- The problem is that some children have to work much harder than others to perform the same tasks, and it is this expenditure that so seriously depletes their capacity to meet subsequent challenges
- A child who daydreams excessively or is inordinately hyperactive is certainly not culpable in any way, and it would be deeply unfortunate to treat the child as if he were, however unconscious this might be
- We need to understand and thereby mitigate the drains on their nervous system

## The Source of Poor Self Control



- What studies show is that some children are dealing with far too much stress in their lives, because of biological, social, psychological, and/or environmental reasons
- These children have to work much harder to pay attention, and an allostatic load condition is going to get ever more entrenched as the negative effects caused by falling further and further behind or having greater and greater social problems exacerbate the drain on their already over-stretched nervous system

# The Importance of Understanding a Child



- Self-regulation is a foundation for self-control and self-discipline
- Critical for enabling the child to engage in those social experiences that underpin the development of self-control and self-discipline
- A child who has difficulty engaging in these critical social experiences because of the drain on his nervous system can indeed be helped; but only if s/he is first understood

# Readings



- Duckworth, A & M Seligman 2005 Self-Discipline Outdoes IQ in Predicting Academic Performance of Adolescents *Psychological Science*, 16, 12, 939-944
- Mischel, W., Shoda, Y., & Rodriguez, M. L. (1989). Delay of gratification in children. *Science*, 244, 933-938