

Biosocial “Science Talk” - Kinsey et al.

Appendix A. Allostatic Load Scripts (Bio-centric and Biosocial)

All About Allostatic Load! (Bio-centric script)

Goal

- Main goals: to teach the concepts of allostasis and “allostatic load,” demonstrate how stressors interact with the immune system inside the body, and conclude with a discussion of tactics for combating the negative impacts of stress.

Materials

- Sash/jacket meant to represent the player’s role as a white blood cell
- Ping-pong balls representing various forms of chronic stress
- A single, larger ball representing a cold/flu virus
- Cards featuring a “cave person” and various environmental stressors (sabertooth tiger, a lack of/difficulty finding food, etc.)
- An enclosed, rectangular box housing an inclined plane/ramp with an opening and exit through which balls can be dropped by the facilitator and caught by the guest

Set-up

- Set up the title banner on the table in front of the activity.
- Position the box (with ramp) in a way so that visitors can put their hands in and the facilitator can drop “stress” balls.
- Make sure there are an adequate number of “stress” ping pong balls.
- Baskets or buckets should be used for storing and pouring ping pong balls. Ping pong balls should be put into three containers (think of each container as representing different degrees and stages of stress in the game; the container with the fewest balls is the least stress, the container with the most balls, the greatest stress).
- Off to the side, have the caveperson and stressor cards ready and at hand.

Demonstration

To be spoken

To be performed

- *Greet the audience, ask if they want to play a game*
- *Begin by explaining that today our game is going to be about stress. Ask the guests if they know what stress is.*
- **Caveperson preamble:** Demonstrate the concepts of “acute stress” and “chronic stress” by showing them the caveperson and sabertooth tiger cards.
 - Explain how acute stress can help us by sending signals from the brain to the body in times of danger. *When we feel excited or scared, our brains send signals to our bodies that help the body do things it might not otherwise be able to do, like run away quickly from a sabertooth tiger!* Act out a scene with the caveperson and the sabertooth tiger. *When the danger is over, our bodies go back to feeling and acting normally. We call this stress that comes and goes “acute stress.”*
 - Explain how stress that does not go away can be bad for our bodies. *When the stress doesn’t go away, our brain keeps sending signals to the body, which can be bad.* Act out scene in which the cave man encounters the sabertooth tiger over and over. Pantomime the caveman feeling sick.
 - Explain that *your body has a harder time keeping itself healthy when it has to deal with lots of stress! Stressful events in your everyday life such as feeling sad, having to take care of a pet, or taking a test at school might make it harder to stay healthy.* We call this “**Allostatic Load.**”

- **The Game:** At this point, ask the visitors if they are ready to start the game. When they say yes, they are promptly given a sash/jacket and told they will play the role of a white blood cell in the game.
 - The visitor is then thrown a "flu" ball. When they capture it, say *"good job. this all what you will have to do for the rest of the game to be a successful white blood cell. White blood cells are in charge of keeping your body healthy."*
 - The visitor is then shown a clear plastic container which will have a small door in it. The visitor will be asked to *place their hand in the door and keep capturing the flu ball in order to keep the body healthy. This is their task for the remainder of the game.*
 - A visitor is prompted to flip over a card. The card shows a stressor, in this case a sabertooth tiger. It is explained that a little bit of stress is being added to the caveman's system. Six balls, in addition to the flu ball, will be thrown into the container. When the visitor captures the flu ball again, congratulate them: *You are an excellent white blood cell!*
 - Continue by having the visitor flip over another card, while explaining that this is a new stressor and twice as many balls in addition to the flu ball will be added. *Briefly check in with the visitor as to how they felt about their job as more balls were added.*
 - Finally, the visitor flips over the last card showing the other two stressors repeated over and over, add all of the remaining balls simultaneously, overwhelming the "white blood cell." Again, ask the visitor, *"When was it easiest to do your job as a white blood cell? When was it the most difficult?"*
 - Ask the visitor to take out one of the other balls and to read what it is printed on the ball, which is "stress."
 - Explain that *just like the container got overwhelmed by stress balls, your body can get overwhelmed by stress too.* Remind the visitor of how the caveperson became stressed by the sabertooth tiger.
- **Conversation:**
 - *Now that you know what allostatic load is and how it can impact the health of the body, can I ask you a question? As a white blood cell, how would you change the game to make it easier for you to do your job? Show me.* (Presumably, the participant will eliminate the stress balls so that the cold ball is easier to capture, thereby demonstrating how reducing allostatic load can improve the body's physical health).
 - Open up a conversation about what healthy ways of dealing with chronic stress (getting enough sleep, exercising, spending time with friends and family, even just laughing and smiling).

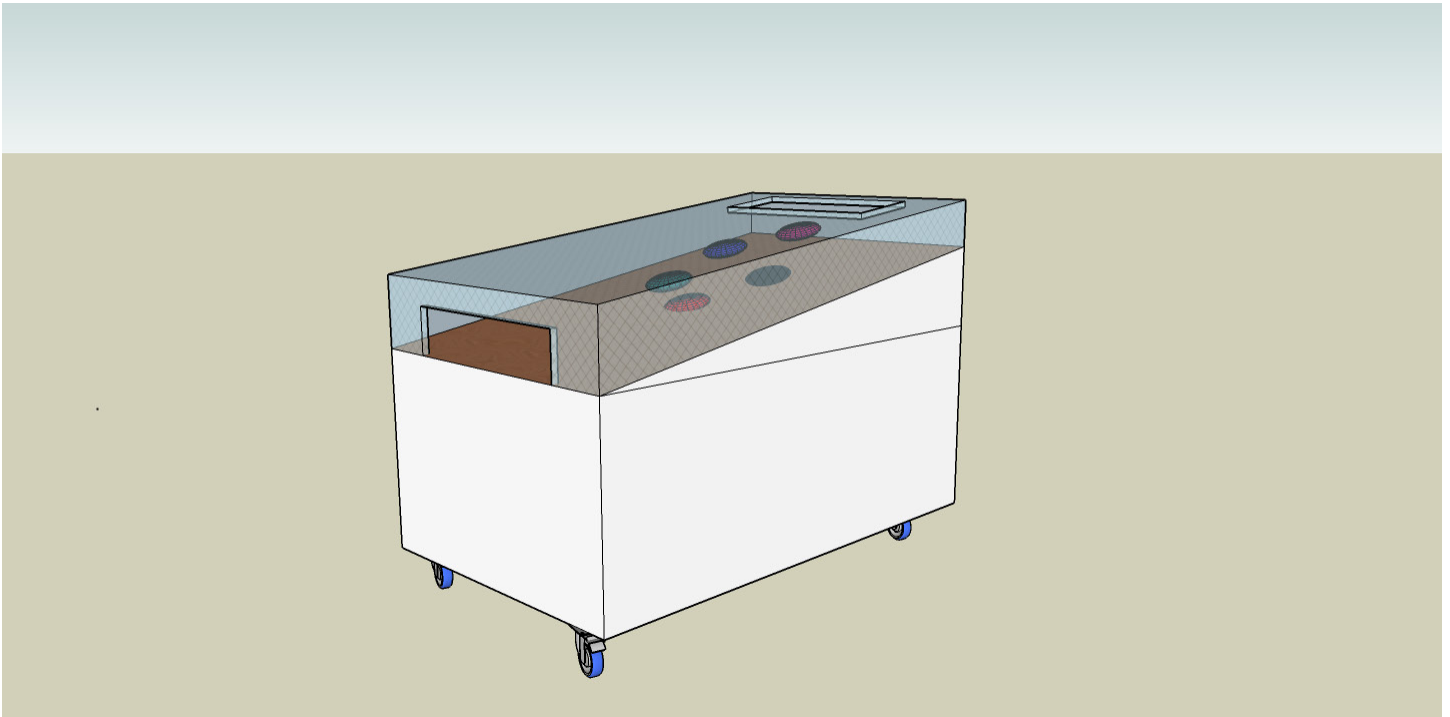
Background Science

Allostatic load is a construct meant to describe the "wear and tear" that accumulates as an individual is exposed to repeated or chronic stress. It represents the physiological consequences of chronic stress, resulting in fluctuating or heightened neural or neuroendocrine response. The term was coined by McEwen and Stellar in 1993.

The body's stress response is essential for the physiological management of acute threats. When a threat is perceived, stress hormones such as epinephrine and cortisol, in combination with other stress-mediating physiological agents such as increased myocardial workload, decreased smooth muscle tone in the gastrointestinal tract, and increased coagulation, activate in order to maintain general organ function. More simply, hormones activate to help bodies achieve physical functions they might not otherwise achieve (e.g., running faster to escape a predator). This adaptation has been called "allostasis" or "maintaining stability through change," which is an essential component of maintaining homeostasis (the process through which bodily systems remain at a healthy constant).

Rather than an actual physiological condition, allostatic load is a conceptual framework used to explain how frequent or chronic activation of the body's stress response can result in physiological wear and damage. In environments of chronic or frequent activation of the stress response, such as exposure to violence or trauma, poverty, war, hypoxia, or low rank in a social hierarchy (experiences of racism, sexism, homophobia, xenophobia, etc.), the stress response constantly disrupts homeostasis resulting in overexertion of physiological systems. Allostatic load is generally measured through a composite index of indicators of cumulative strain on several organs and tissues, primarily biomarkers associated with the neuroendocrine, cardiovascular, immune and metabolic systems. Allostatic load has been linked to negative impacts associated with hypertension and diabetes, adverse birth outcomes, mental health and cognitive functioning at older ages.

Basic Design



All About Allostatic Load! (Bio-Social script)

Goal

- Main goals: to teach the concept of "allostatic load," demonstrate how social stressors interact with the immune system inside the body, and conclude with a discussion of tactics for combating the negative impacts of stress.

Materials

- Sash/jacket meant to represent the player's role as a white blood cell
- Ping-pong balls representing various forms of chronic stress
- A single, larger ball representing a cold/flu virus
- An enclosed, rectangular box housing an inclined plane/ramp with an opening and exit through which balls can be dropped by the facilitator and caught by the guest.
- Stressor cards (scary dog, alarm clock, test at school, etc.)

Set-up

- Set up the title banner on the table in front of the activity.
- Position the box (with ramp) in a way so that visitors can put their hands in and the facilitator can drop "stress" balls.
- Make sure there are an adequate number of "stress" ping pong balls.
- A basket or bucket should be used for storing and pouring ping pong balls

Demonstration

To be spoken

To be performed

- *Greet the audience, ask if they want to play a game*
- *Begin by explaining that today our game today is going to be about stress. Ask the guests if they know what stress is.*
- *Explain that stress can be a word used to describe your body's reaction to being too overwhelmed. Something that is scary or exciting or exhausting can cause the body to be stressed. Stress can have an effect on your body, thoughts, feelings, and behavior.*
 - *Explain that your body has a harder time keeping itself healthy when it has to deal with lots of stress! Stressful events in your everyday life such as feeling sad, arguing with a friend or sibling, or getting in trouble at school might make it harder to stay healthy. And, when your body is feeling bad, it is harder to deal with things in your life.*
- **The Game:** At this point, ask the visitors if they are ready to play a game. When they say yes, they are promptly given a sash/jacket and told they will play the role of a white blood cell in the game.
 - The visitor is then thrown a "flu" ball. When they capture it, say *"good job. this all what you will have to do for the rest of the game to be a successful white blood cell. White blood cells are in charge of keeping your body healthy."*
 - The visitor is then shown a clear plastic container which will have a small door in it. The visitor will be asked to *place their hand in the door and keep capturing the flu ball in order to keep the body healthy. This is their task for the remainder of the game.*
 - A visitor is prompted to flip over a card. The card shows a stressor, in this case a scary dog. It is explained that a little bit of stress is being added to a kid's system. Six balls in addition to the flu ball will be thrown into the container. When the visitor captures the flu ball, congratulate them, *you are an excellent white blood cell!*
 - Continue by having the visitor flip over another card, while explaining that this is a new stressor and twice as many more balls in addition to the flu ball will be added. *Briefly check in with the visitor as to how they felt about their job as more balls were added.*
 - Finally, the visitor flips over the last card showing the other two stressors repeated over and over, add all of the remaining balls simultaneously, overwhelming the "white blood cell." Again, ask the visitor *"When was it easiest to do your job as a white blood cell? When was it the most difficult?"*
 - Ask the visitor to take out one of the other balls and to read what it is printed on the ball, which is "stress."
 - Explain that, *just like the container got overwhelmed by stress balls, your body can get overwhelmed by stress too. Too much stress can also lead to wear and tear on the body, which is called "allostatic load." Allostatic load can even make it difficult to heal from a disease such as a flu.*

• Conversation:

- *Now that you know what allostatic load is and how it can impact the health of the body, can I ask you a question? As a white blood cell, how would you change the game to make it easier for you to do your job? Show me.* (Presumably, the participant will eliminate the stress balls so that the flu ball is easier to capture, thereby demonstrating how reducing allostatic load can improve the body's physical health. [If the visitor struggles to find a solution to make the white blood cell's job easier, prompt them with a question about whether the 'stress balls' made it more difficult or easier to do their job]).
- Open up a conversation about what healthy ways of dealing with chronic stress (getting enough sleep, exercising, spending time with friends and family, even just laughing and smiling).
- *So today we discussed how stress not only can make you feel bad, but it can hurt your body as well. The good news is that just as stress can hurt the body, doing things that make you happy (sleeping, playing outside, doing fun things with your friends and family, etc.) can keep your body healthy!*

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Basic Design

