Elaine Currie

Psych 488

Content Review 1

October 30, 2018

1. John Henryism

John Henryism is the term for people who perceive themselves as having complete control over all outcomes in their lives (Sapolsky, 2004). This term was originally derived from an African American folk tale about a man who outraced a steam drill to tunnel through a mountain, but died after doing so from working too hard. The main idea of both the tale and the concept is that people who work too hard due to an internal locus of control are negatively affected by stress when the tasks over which they perceive control are uncontrollable. I see this when I believe that I have the power to control what grade I get on a test. Although it's true that to some extent I can influence the grade by studying, I cannot control what questions a professor will ask, and therefore I can't control my grades very precisely. Despite knowing this, however, I make it my mission to learn every possible piece of information from class so that no test question could cover content that I don't know. Even still, professors can ask application questions that test your ability to assess new situations, which is a task that you cannot prepare for just by reviewing class content. For this reason, I *still* cannot control my grade outcome, regardless of how much I go over class content to prepare. In a study conducted by Sherman James (1994), blood pressure was recorded and compared between Black participants and White participants. Within the Black participant pool, individuals with better occupations and greater amounts of schooling had lower blood pressure than individuals of the same group with worse occupations and lower levels of schooling. When the Black participant pool was divided by scores on a scale of John Henryism, however, participants from the lower socioeconomic status (SES) who were low in levels of John Henryism had more similar blood pressure levels to Black participants from the higher SES, while participants from a lower SES and high in levels of John Henryism showed the same elevated blood pressure levels as before. This evidence suggests that the negative health outcomes of lower socioeconomic status and less schooling are at least in part due to the locus of control of an individual; those people who are more likely to perceive control over various life outcomes are more likely to engage in continuous hard work, thereby promoting chronic stress. This topic is most important to me

because I see a lot of the qualities of John Henryism in myself; I almost always believe that I have control over a given outcome, and then I work as hard as possible to reach my preferred outcome. This is often done at the expense of my physical health or mental well-being, but I can't seem to turn it off. I wanted to explore this topic more to better understand how this quality is affecting me, and to compel myself to work harder to change it, by accepting that there are stressors in my life, but still choosing not to work too hard.

2. Inverted-U Stress Response

The inverted-U model of stress response shows that there is a certain level of stress that is optimal for an individual's performance, and performance decreases as you deviate from that level (Sapolsky, 2015). One mechanism that explains such a curve is that of synaptic plasticity in the prefrontal cortex. We discussed in class how at low to moderate levels of stress, synaptic plasticity in the prefrontal cortex is enhanced, allowing for more flexible behavior; at moderate to high levels of stress, synaptic plasticity is inhibited, promoting more habitual behaviors. This makes sense in the context of the inverted-U model because as your behaviors are more habit-driven and less flexible, you are less likely to use problem solving skills to find the best option for handling the stressor. At the other end of the inverted-U model, a lack of arousal (extremely low stress) leads to lower performance because you don't feel a drive to put energy into acting on a task. One real-world example is job hunting. If you have an upcoming interview for a job, but you are not stressed at all about the prospect of the interview, you are not likely to interview as well as someone who was just stressed enough to spend time preparing answers to potential questions and do some research about the potential employer. On the other hand, if you are overly stressed about the interview, you will still perform worse than someone who was optimally stressed because you were so overwhelmed by stress that you couldn't overcome its negative effects. The optimal level of stress differs between individuals, as does the actual stress response to a given stressor, so it is impossible to say with great certainty what the "optimal" stress level is, but we can identify two qualities of optimal stress. The first is that it occurs in a setting where you feel safe, and the second is that it is not long-lasting. I chose the inverted-U as one of my most important topics because I find it significant for college students as a population who are constantly test-taking, interviewing for internships and jobs, competing to get into their majors—just competing in general. I usually find myself somewhere towards the middle-right of the graph, but I'm interested in trying to shift myself to always be in the middle, and I hoped that doing some extra

research to understand the inverted-U model would also help me understand how to best move myself towards the optimal stress level, or at least help me to identify when I have reached it.

3. How Control Affects the Stress Response

Control over a stressor, and more specifically perceived control over a stressor, has a negative relationship with stress levels—as one goes up the other goes down (Sapolsky, 2004). In everyday life this can be seen as a function of workplace stress. Most people are not high-ranking executives with lots of control, and instead are just told what to do by their boss and then expected to do it. In such situations, the stress response has been shown to be more related to the amount of control a worker has over things like how fast they are expected to work and how flexible the schedule is, rather than the volume of work they are being expected to do. In my life, I have noticed an example of this in my Phil120 section. We all have to give 15-minute presentations on a topic related to logic, but we have control over what exactly we present about and when we present it. When I was first handed this assignment, I was stressed about finding a topic that matched up with what we were doing in the class, until my professor told me that it could be a topic only tangentially related to course content. Once I was given control over the topic and the timeline of the presentation, my stress levels decreased significantly. One case where control is not beneficial for reducing the stress response is when the stressors were actually beyond control, but you perceive control over them anyway. In this situation, you may believe that you were responsible for a tragedy when in reality it was unavoidable, and this perception of control may increase the stress and guilt you feel in the aftermath. As a rule of thumb, if you can easily think of a way that the situation could have been worse, then feeling some sense of control will reduce the stress response, but if it's difficult to imagine how things could've gotten any worse, then a sense of control will not be beneficial. This topic is important to me because I have watched a lot of my friends blame themselves for things that were really inevitable. I hope to use this knowledge to better understand how they are thinking through the events, and to help them take the blame off themselves.

4. Hormones of the Stress Response

In the immediate stress response, the sympathetic nervous system releases epinephrine and norepinephrine, which cause the initial arousal of the body in the face of a stressor (Sapolsky, 2004).

Epinephrine and norepinephrine create the response that we most often associate with being scared. For example, if your friend waits for you to come home and jumps out at you as soon as you enter a room, your immediate adrenaline rush, impulse to run away, elevated heart rate and breathing rate—those are all a result of the release of epinephrine and norepinephrine. The physical activity initiated by epinephrine and norepinephrine is then bolstered by the later release of glucocorticoids, such as cortisol. The release of glucocorticoids originates in the hypothalamus, which releases CRH. CRH then triggers the release of ACTH from the pituitary gland, and once ACTH reaches the adrenal gland it triggers glucocorticoid release. Glucocorticoids combined with epinephrine and norepinephrine control most of the physiological responses to and effects of stress. I chose this topic to include in my content review because understanding the stress response better was one of my main reasons for originally taking this course. Writing this paragraph as concisely as possible has also been good practice towards meeting one of the goals I set for myself in the course preview, which was to be able to clearly and accurately describe the stress response to someone with no prior knowledge of the subject.

5. Effects of Chronic Stress

Chronically activating your stress response increases your risk of heart disease by elevating your blood pressure, causing you to develop hypertension (Sapolsky, 2004). Hypertension forces blood vessels to work harder to regulate blood flow and also returns blood to the heart with more force, causing both the blood vessels and the heart to build up a wall of muscle. This creates a vicious cycle of higher blood pressure, followed by a build-up of muscle, and then an even higher pressure as the muscle constricts the blood flow even more. Damage occurs more frequently within branching blood vessels due to the increased blood pressure, and damage sites become hotspots for plaque formation. The amount of damage in blood vessels is the best known predictor of cardiovascular disease that we currently have. Once enough plaques build up they start to obstruct blood flow; this could entail claudication in the legs and chest, coronary heart disease, or myocardial ischemia to name a few. In short, chronic activation of the stress response can lead to development of plaques in your blood vessels, which is really the root for a variety of very dangerous conditions. In my own life I have seen this effect of stress in a close family member. After working at a high pressure job for a number of years, he experienced chest pain. Upon visiting a doctor they found massive plaque buildup, and sent him to have bypass surgery the next day. Despite being young and in otherwise good health, the stressors in his life had enough influence over

his health to necessitate a coronary bypass surgery. The chronic effects of stress are not limited to the cardiovascular system; in a study of the effects of chronic stress on rat brains, Joëls et al. (2005) found that there are a variety of structural changes that happen in the brain as a result of chronic stress. The first was increased vulnerability to cell death in the hippocampus due to enhanced glutamate transmission and enhanced calcium channel expression. The hippocampus also showed reduced neurogenesis and apoptosis after exposure to chronic stress, as well as suppressed synaptic plasticity, leading to deficits in memory. Lastly, researchers observed reduced response to serotonin, which they hypothesize may explain some of the relationship between stress and depression. I chose to include this topic in my content review because college is a period of chronic stress for almost all students, and I think it's important to understand just how bad this can be for your physical health and for your brain before you can do anything to change it.

6. How Social Support Mediates the Stress Response

Social support networks reduce our stress response if we use them as outlets for the stressors we are experiencing (Sapolsky, 2004). For example, if you are stressed about schoolwork and confide in a friend and classmate, their support and commiseration is enough to reduce physical glucocorticoid levels. The only caveat here is that the support has to come from someone you actually know and are friends with, or from an entire community you identify with—it can't come from a stranger. Three trends seem to emerge in the relationship between higher social support and lower physiological stress. The first is that this relationship seems to be due more to perceived social support than due to actual support (Thoits,1995). The second is that the relationship is not merely a product of the number of connections are in your social network; the real mediator for stress seems to be related to the perception of emotional support. Finally, the strongest indicator of social support is the presence of an intimate relationship. These three trends all fit together to describe what is most determinant in whether social support will mediate stress effectively. It is theorized that the reason close connections can affect stress is that social support can influence an individual's coping mechanisms and physical health, promoting healthier coping and lifestyle, but there are no studies that I found that have been done to test this theory. I was interested in researching social support as a mediator of stress because I find that it is my most frequently referenced coping resource and strategy in my weekly reflections. I wanted to look more in-depth into how exactly social support seems to affect stress levels, but it seems that there is not much known as far as specific

mechanisms go. This concept is one of the most important to me because social support consistently comes up in my weekly reflections as my most used coping mechanism. It was also just important for me personally to research social support as a coping resource as a way to put emphasis on the things that I have in my life that I have working in my favor to reduce the effects of stress in my life. It's so easy to get caught up in the negative effects of stress and focus on what's bad, so it's important for me to remind myself of all the great coping resources and strategies I have available to me, social support being just one.

7. How Predictability Affects the Stress Response

Predictability makes stressors less stressful (Sapolsky, 2004). Being given a warning sign that a stressor is on its way not only signals when a stressor will be there, but also when it will not be there. Predictability comes in more ways than just overt signals that a stressor is coming; predictability also comes from the habituality of certain events and from emotional precursors to certain stressors, to name a few. Predictability provides advanced warning that allows us to prepare for the onset of that stressor, if not physically then at least mentally. Armed with information about what stressor you are about to experience and when it will happen can greatly change your experience of stress because it is able to change how you cope with that stressor. For example, if you know that you have a quiz coming up next week in a class that has been confusing you, you may engage in a problem-focused coping strategy by planning to start studying the material now rather than waiting until the night before the test. If you were given a pop quiz in the same class, however, your stress response will be much higher, because you had no chance to mentally plan for the arrival of the stressor or to engage in problem-focused coping strategies. There are a few caveats to the statement that predictability reduces stress. The first is that predictability does not reduce stress for events that are either commonplace or extremely rare (Sapolsky, 2004). Something that is common does not require any predictive information in order for you to assume that it will happen, nor does it stress you out that it will happen. On the contrary, receiving a warning about something that is extremely rare will be more stressful because it is something that wouldn't normally cause you stress but getting a warning causes stress about that event. Another caveat is that if the warning comes too early before a stressor, or too close to when the stressor will occur, you will not derive the same psychological benefits that are associated with predictability in general. The final two caveats about predictability are that it will not be useful when the stressor is something devastating, and it will not reduce

stress if the predictive information is vague (Sapolsky, 2004). Otherwise, predictability is generally advantageous to reducing the stress response. This topic is important to me because it gives a more positive view to our interactions with stress, and it gives me a feeling of power over my stress. Typically I think of stress as an external force on my life, but understanding how to use predictability to my advantage helps me feel like stress is more manageable.

8. Hostile Personalities and How They Interact with the Stress Response

Having a "Type A" personality—competitive, overachieving, impatient, hostile—has been linked to higher levels of cardiovascular disease (Sapolsky, 2004). When further studies were done to examine this relationship, hostility was pulled out as the primary quality of type A to predict cardiovascular disease. The correlation between high hostility and high rates of heart disease may be partially related to other risk factors (i.e. hostile people may be more likely to eat junk food or to smoke), as well as partially related to a lack of social support. There is also a biological factor at play, which is that hostile people are likely to have more frequent and stronger stress responses. For example, someone with a hostile personality who gets cut off on the highway will have a large stress response that may last for many minutes, while someone who does not have a hostile personality may not have a stress response during this event at all (or if they do it will be mild, and short-lived). Given enough stressors like this throughout the day, it is clear how someone with a type A/hostile personality may be more likely to develop heart disease. I chose this topic as important because others have often described me as acting type A, and I wanted to look into what this entailed for me. Completing this assignment helped clarify for me exactly what about being type A can have negative health impacts—that it is the hostility component that is really problematic, not the competitiveness or overachieving qualities.

Works Cited

James, S. (1994). John Henryism and the health of African-Americans. *Culture, medicine and psychiatry*, *18*(2), 163-182. DOI**:** 10.1007/BF01379448

Jöels, M., Karst, H., Alfarez, D., Heine, V. M., Qin, Y., Van Riel, E., Verkuyl, M., Lucassen, P. J., Krugers, H. J. (2005). Effects of chronic stress on structure and cell function in rat hippocampus and hypothalamus. *Stress: the international journal on the biology of stress, 7*(4), 221-231. DOI**:** 10.1080/10253890500070005

Sapolsky, R. (2004). *Why zebras don't get ulcers.* New York, NY: St. Martin's Griffin.

Sapolsky, R. (2015). Stress and the brain: individual variability and the inverted-U. *Nature neuroscience, 18(10),* 1344-1346.

Thoits, P. A. (1995). Stress, coping, and social support processes: where are we? What next? *Journal of health and social behavior,* 53-79. DOI: 10.2307/2626957