Balancing Stress & Performance

The Yerkes-Dodson Law

The inverted "U," also called the Yerkes-Dodson law, is the idea that a certain amount of stress - physical or mental - helps improve a person's performance up to a certain point, but there's a point of diminishing return where too much stress actually decreases performance. Researchers look at what optimal levels of stress are, and how that can differ across people and communities.

There are ways to reduce the negative effects of stress – observe what you're feeling emotionally and physically in your body; proactively bring up stress with your health care professional; exercise, even if it's just taking a break for a walk or stretching; set boundaries around your time and what's achievable; nurture connections with others.

Sources:
R.M. Yerkes, J.D. Dodson (1908). The relation of strength of stimulus to rapidity of habit formation. Journal of Comparative Neurology and Psychology, 18,459-482; J. David Creswell, Laura E. Pacilio, Emily K. Lindsay, Kirk Warren Brown (2014). Brief mindfulness meditation training alters psychological and neuroendocrine responses to social evaluative stress. Psychoneuroendocrinology, 44, 1-12; National Institute of Mental Health. 5 Things You Should Know About Stress. https://www.nimh.nih.gov/health/publications/stress/index.shtml

Center for healthyminds
UNIVERSITY OF WISCONSIN–MADISON

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Early Research Suggests Mindfulness Training Improves Mental Health Outcomes in Police Officers

Law enforcement officers are regularly exposed to stressful situations as part of their work, which affects their overall mental and physical health and also the communities they serve.

What if police departments could offer a proactive approach for lessening symptoms of post-traumatic stress disorder (PTSD), lowering stress and improving sleep for officers? This question was of interest to Center for Healthy Minds researchers in a pilot study with the Madison Police Department in Madison, Wisconsin.

A recent Center paper published in the *Journal of Police and Criminal Psychology* showed that eight weeks of mindfulness training resulted in reductions in work-related stress, improvements in sleep quality, lower levels of burnout and reduced depression and anxiety in police officers. Most of these effects continued five months after the training period. In addition, the researchers found novel evidence of a reduction in PTSD symptoms among officers after the training program.

"Providing officers with strategies and skills to cope with daily occupational and organizational stressors seems critical for improving stress-related outcomes in this population," says Dan Grupe, associate scientist with the Center and lead author on this paper. "The impact on the greater community that these officers serve could also be significant."

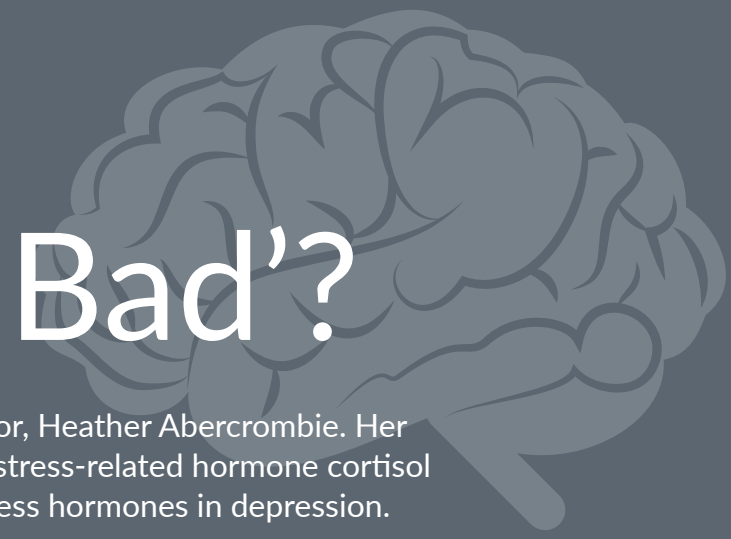
Chronic work-related stress for police officers contributes to higher rates of cardiovascular disease and risk factors associated with poorer cardiac health - including obesity and metabolic syndrome. Sleep disorders are also very common in police officers, with 40 percent screening positive for a sleep disorder, which has been linked to errors due to fatigue, expressing anger toward others and receiving complaints from citizens in their community.

After eight weeks of training, officers reported lower total PTSD symptoms with especially significant lower levels of hyperarousal symptoms – the feeling of being "on guard," having difficulty sleeping due to higher levels of vigilance or startling very easily. The reported reduction in hyperarousal symptoms was still significant five months after the program.

"Vigilance and hyper-awareness are adaptive traits that can be useful if you're policing but are not beneficial when your shift ends and you're spending time with family or trying to fall asleep at night," says Grupe. "Our results suggest that this training may allow officers to notice whether their response is appropriate to their current situation and give them the tools to adapt their response if necessary."

A follow-up study, currently in progress, includes 115 officers from three agencies in Wisconsin.

Are Stress Hormones 'Bad'?



This year, the Center welcomed a new Science Director, Heather Abercrombie. Her previous work helped debunk popular notions of the stress-related hormone cortisol as unequivocally harmful and examines the role of stress hormones in depression.

Q:

Heather Abercrombie

It's common to hear the term "cortisol" and think it's bad because it implies distress. What does the science say?

There are a lot of misconceptions about stress and cortisol. Indeed, the hormone cortisol is increased with stress, but it's also released in a lot of different situations. For instance, it plays an important role in breaking down energy stores in our body and making them available for use. It is elevated when we wake up in the morning and when we exercise – two situations in which we need a metabolic boost, but are not distressing per se.

Q:

Heather Abercrombie

How might studying cortisol improve our understanding of mental health?

Chronically elevated cortisol causes harm, which is well-known. Less well-known is that cortisol resistance (or cellular insensitivity to cortisol, in which the cortisol signal in the brain is too low) also causes harm. It's been known for decades that many individuals with depression show cortisol resistance, which is conceptually similar to insulin resistance in Type 2 diabetes, in that cells in the body are not as responsive as they should be to the hormone. Even though we've known some people exhibit cortisol resistance, we've had no idea how it's related to the changes in emotions, thinking and brain function that occur in depression. Some people probably do not have enough cortisol signaling in the brain. One major question we have is whether these people benefit from an acute boost in cortisol signaling. We've done research with placebo-controlled experiments looking at whether cortisol augmentation actually benefits emotional cognition, and so far, we found that to be the case. We looked at negative bias in memory, which is common in depression. Cortisol augmentation does indeed reduce negative memory bias. It's like the brain is starving for cortisol, and we're quenching the brain's thirst.

Q:

Heather Abercrombie

Would this mean future treatments for depression could target cortisol?

Although cortisol is effective in this way, there are no antidepressant medicines that directly target it. Why is that? Our bodies adapt so quickly to taking a steroid like cortisol, and taking it longer can produce some really detrimental effects. In order to develop drugs that would directly address cortisol resistance in depression, scientists need to understand the cellular alteration that's causing cortisol insensitivity in the cell (or "cortisol resistance") and address that pharmacologically. Antidepressants commonly used, like those that target the serotonin system, do appear to ameliorate cortisol resistance though we don't know exactly how. In addition, activities that acutely boost cortisol, like exercise, may benefit mood in part through its effect on cortisol.

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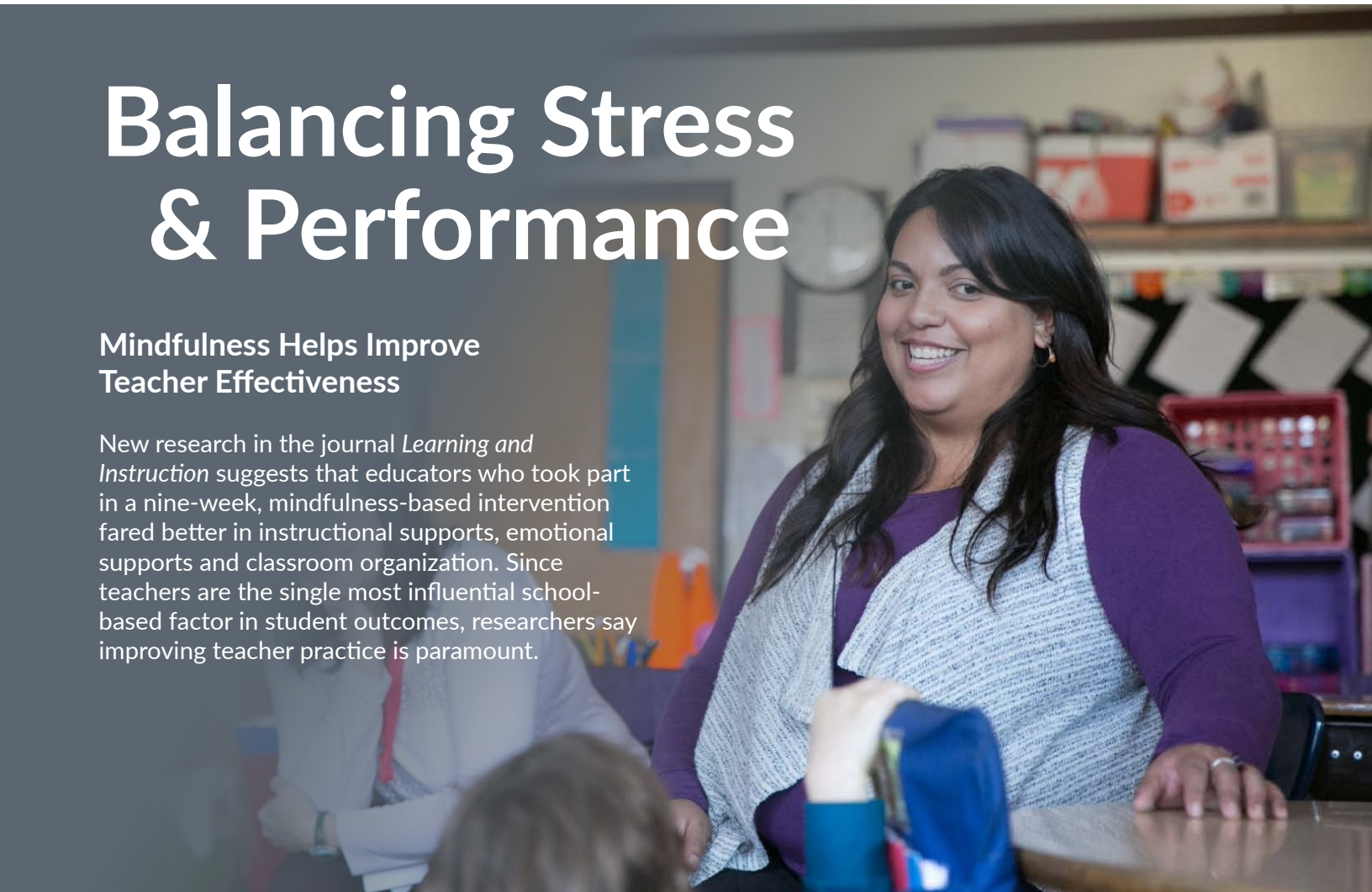

Mindfulness Helps Improve Teacher Effectiveness

New research in the journal *Learning and Instruction* suggests that educators who took part in a nine-week, mindfulness-based intervention fared better in instructional supports, emotional supports and classroom organization. Since teachers are the single most influential school-based factor in student outcomes, researchers say improving teacher practice is paramount.