

Short-term academic pressure can catalyze better learning performance

Ni Putu Wulan Purnama Sari

Faculty of Nursing, Widya Mandala Surabaya Catholic University, East Java, Indonesia

May 10, 2024

“But because of the chaotic times, he did not become an official but spent his time learning and pondering plans to contain the chaos, save lives and build a prosperous country.

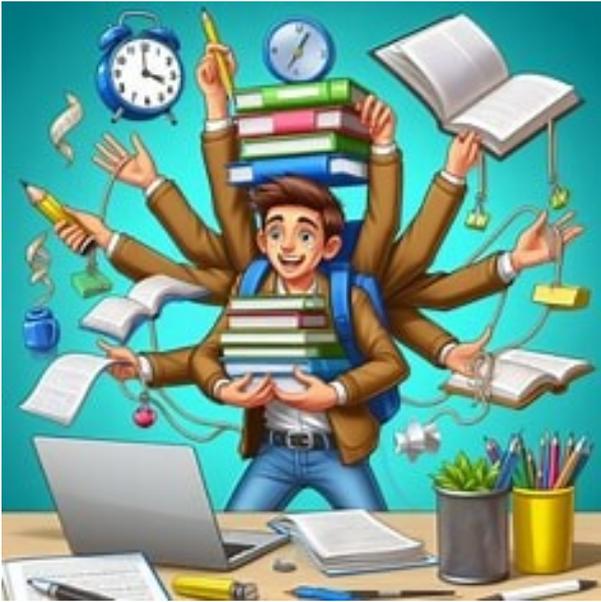
—In “The Weirdest Fishhook”; *The Kingfisher Story Collection* [1]

~~~

Hans Selye, often referred to as the father of stress research, initiated the first experiments on stress in 1936, not with humans but rats [2]. Since then, extensive research has been conducted on the effects of stress in various human populations and contexts, significantly enriching our understanding of this phenomenon. Among these studies is the exploration of academic stress, which has escalated due to increased academic and social pressures on students. Previous research identified several sources of academic stress, including examinations and assignments, extracurricular and cram school activities, parental expectations, teacher demands, lack of support, and peer pressure. Prolonged exposure to such academic pressures can lead to chronic stress responses in students, often referred to as distress.

The duration of exposure to stressors can also influence the nature of the stress response. While distress is considered harmful stress that adversely affects mental health and quality of life, eustress—or positive stress—can lead to beneficial outcomes. In the context of academic pressures, short-term stress is deemed necessary to enhance learning outcomes

and promote higher achievement.



**Illustration.** Generated by Windows Copilot

In a recent study, Anh-Duc Hoang [3] examined the effects of short-term academic pressure on learning outcomes in 1,228 eighth-grade students. The study has three phases. In the first phase, he gave all the students 100 simple math questions and asked them to solve as many problems as possible within 90 seconds.

In the second phase, the students were divided into three groups after an initial math test:

1. A control group that did not perform any task
2. A group that tackled an easy task
3. A group that tackled a difficult task

For the first group, students waited 90 seconds without doing anything. The remaining students were asked to find a word in a document containing the plot of Harry Potter and the Goblet of Fire, with the second group's students being asked to find an easier word than those in the third group. This activity was to expose the students to short-term stressors.

In the third phase, all the students were asked to solve 100 simple math questions similar to those in phase 1 but randomly shuffled.

Hoang applied the Bayesian Mindsponge Framework (BMF) to develop a multi-level varying

intercept model, analyzing the data with BMF analytics to assess the impact of short-term academic pressure on learning [4]. The multi-level model helps inform the differences among groups explicitly and improves the estimation precision when the sampling is imbalanced (i.e., one group has a significantly higher number of samples than others) [5].

The results revealed that respondents who successfully accomplished the difficult task showed higher math-solving performance than those who accomplished the easy task. Respondents who failed in either the easy or the difficult task showed lower outcomes than the control group who did nothing about the task. There was no significant difference across genders regarding learning outcomes after the intervention. These results highlight the varying effects of short-term academic stress exposure on students' learning outcomes, depending on coping strategy.

These findings lend support to the Yerkes-Dodson Law, which posits that human performance increases with mental arousal up to a point beyond which performance may decline if arousal continues for too long [6]. In practical terms, this suggests that educators should aim to regulate the duration of academic stress exposure to optimize students' learning performance and academic achievement.

## References

- [1] Vuong QH. (2022). *The Kingfisher Story Collection*. <https://www.amazon.com/dp/B0BG2NNHY6>
- [2] Selye H. (1936). A syndrome produced by diverse noxious agents. *Nature*, 138(3479), 32–32. <https://doi.org/10.1038/138032a0>
- [3] Hoang AD. (2024). The impact of short-term pressures on students' performances: An experimental study. *International Education Journal: Comparative Perspectives*. <https://philarchive.org/rec/HOATIO-2>
- [4] Vuong QH, Nguyen MH, La VP. (2022). *The Mindsponge and BMF Analytics for Innovative Thinking in Social Sciences and Humanities*. Walter de Gruyter GmbH. <https://www.amazon.com/dp/8367405102>
- [5] McElreath R. (2020). *Statistical Rethinking: A Bayesian Course with Examples in R and Stan*. Chapman and Hall/CRC. [https://www.google.com/books/edition/Statistical\\_Rethinking/1yhFDwAAQBAJ](https://www.google.com/books/edition/Statistical_Rethinking/1yhFDwAAQBAJ)

[6] Yerkes RM, Dodson JD. (1908). The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology*, 18(5), 459-482. <https://doi.org/10.1002/cne.920180503>

---



©2024 AISDL - Science Portal for the [SM3D Knowledge Management Theory](#)