Senior Comprehensive (CPSC 099) Information Session

09/27/2023

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What is the senior comprehensive

Your chance to present an awesome poster

and

tell your story about a cool project you did

Requirements

- All seniors are automatically signed up for a zero-credit course, CPSC 099
- The grades will be assigned as S (satisfactory) or NC (unsatisfactory) only.
- To earn an S grade, students are responsible for two "deliverables":
  - a poster (details below)
  - a well-prepared, practiced oral presentation accompanying the poster that is six to seven minutes long.

What can your poster be about?

- CS 41 Algorithms
- CS 43 Networks
- CS 44 Databases
- CS 45 Operating Systems
- CS 46 Theory
- CS 49 Probabilistic Methods
- CS 56 Animation
- CS 63 Artificial Intelligence
- CS 65 NLP
- CS 66 Machine Learning
- CS 68 Bioinformatics
- CS 71 Software Engineering
- CS 73 Programming Languages
- CS 75 Compilers
- CS 81 Adaptive Robotics
- CS 87 Parallel and Distributed
- CS 88 Security and Privacy
- CS 89 Cloud Systems
- CS 91 Special Topics Courses in Theory/Systems/Applications
- Research Experience

TIP 1: What awesome posters have in common

- 1000 words or less
- White space around text boxes and figures
- Title in one sentence
- Lists of sentences rather than blocks of text
- Avoid weird color combinations
- Avoid funky fonts (comic sans is for comic books)
- Give your graphs titles or informative phrases.
- Limit the use of acronyms

TIP 2: Printing your poster

Print to a PDF first at 100%

If the PDF looks awful, go back and fix your source file.

TIP 3: Talking about your research

Practice your talk (7 minutes)

Tell us the arch of your project

* what is it about
* why is it interesting
* how did you do it
* main takeaways
* future work

What's wrong with this poster?

PIGS IN SPACE: EFFECT OF ZERO GRAVITY AND AD LIBITUM FEEDING ON WEIGHT GAIN IN CAVIA PORCELLUS

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ABSTRACT:

One ignored benefit of space travel is a potential elimination of obesity, a chronic problem for a growing majority in many parts of the world. In theory, when an individual is in a condition of zero gravity, weight is eliminated. Indeed, in space one could conceivably follow ad libitum feeding and never even gain an gram, and the only side effect would be the need to upgrade one's stretchy pants("exercise pants"). But because many diet schemes start as very good theories only to be found to be rather harmful, we tested our predictions with a long-term experiment in a colony of Guinea pigs (Cavia porcellus) maintained on the International Space Station. Individuals were housed separately and given unlimited amounts of high-calorie food pellets. Fresh fruits and vegetables were not available in space so were not offered. Every 30 days, each Guinea pig was weighed. After 5 years, we found that individuals, on average, weighed nothing. In addition to weighing nothing, no weight appeared to be gained over the duration of the protocol. If space continues to be gravity-free, and we believe that assumption is sound, we believe that sending the overweight — and those at risk for overweight — to space would be a lasting cure.

INTRODUCTION:

The current obesity epidemic started in the early 1960s with the invention and proliferation of elastane and related stretchy fibers, which released wearers from the rigid constraints of clothes and permitted monthly weight gain without the need to buy new outfits. Indeed, exercise today for hundreds of million people involve only the act of wearing stretchy pants in public, presumably because the constrictive pressure forces fat molecules to adopt a more compact tertiary structure (Xavier 1965).

Luckily, at the same time that fabrics became stretchy, the race to the moon between the United States and Russia yielded a useful fact: gravity in outer space is minimal to nonexistent. When gravity is zero, objects cease to have weight. Indeed, early astronauts and cosmonauts had to secure themselves to their ships with seat belts and sticky boots. The potential application to weight loss was noted immediately, but at the time travel to space was prohibitively expensive and thus the issue was not seriously pursued. Now, however, multiple companies are developing cheap extra-orbital travel options for normal consumers, and potential travelers are also creating news ways to pay for products and services that they cannot actually afford. Together, these factors open the possibility that moving to space could cure overweight syndrome quickly and permanently for a large number of humans.

We studied this potential by following weight gain in Guinea pigs, known on Earth as fond of ad libitum feeding. Guinea pigs were long envisioned to be the "Guinea pigs" of space research, too, so they seemed like the obvious choice. Studies on humans are of course desirable, but we feel this current study will be critical in acquiring the attention of granting agencies.

MATERIALS AND METHODS:

One hundred male and one hundred female Guinea pigs (Cavia porcellus) were transported to the International Space Laboratory in 2010. Each pig was housed separately and deprived of exercise wheels and fresh fruits and vegetables for 48 months. Each month, pigs were individually weighed by duct-taping them to an electronic balance sensitive to 0.0001 grams. Back on Earth, an identical cohort was similarly maintained and weighed. Data was analyzed by statistics.

RESULTS:

Mean weight of pigs in space was 0.0000 +/- 0.0002 g. Some individuals weighed less than zero, some more, but these variations were due to reaction to the duct tape, we believe, which caused them to be alarmed push briefly against the force plate in the balance. Individuals on the Earth, the control cohort, gained about 240 g/month ($p = 0.0002$). Males and females gained a similar amount of weight on Earth (no main of effect of sex), and size at any point during the study was related to starting size (which was used as a covariate in the ANCOVA). Both Earth and space pigs developed substantial dewlaps (double chins) and were lethargic at the conclusion of the study.

CONCLUSIONS:

Our view that weight and weight gain would be zero in space was confirmed. Although we have not replicated this experiment on larger animals or primates, we are confident that our result would be mirrored in other model organisms. We are currently in the process of obtaining necessary human trial permissions, and should have our planned experiment initiated within 80 years, pending expedited review by local and Federal IRBs.

ACKNOWLEDGEMENTS:

I am grateful for generous support from the National Research Foundation, Black Hole Diet Plans, and the High Fructose Sugar Association. Transport flights were funded by SPACE-EXES, the consortium of wives divorced from insanely wealthy space-flight startups. I am also grateful for comments on early drafts by Mañana Athletic Club, Corpus Christi, USA. Finally, sincere thanks to the Cuy Foundation for generously donating animal care after the conclusion of the study.

LITERATURE CITED:

NASA. 1982. Project STS-XX: Guinea Pigs. Leaked internal memo.
Sekulić, S.R., D. D. Lukač, and N. M. Naumović. 2005. The Fetus Cannot Exercise Like An Astronaut: Gravity Loading Is Necessary For The Physiological Development During Second Half Of Pregnancy. Medical Hypotheses. 64:221-228
Xavier, M. 1965. Elastane Purchases Accelerate Weight Gain In Case-control Study. Journal of Obesity. 2:23-40.

How about this?

Muse Meditation: Mindfulness, Zen, and Academic Stamina Through the Library

Kellie Sparks, Evening Librarian

Hillary Fox, Science Librarian

background

Mindfulness is the practice of being in the moment. Meditation has the potential to enhance brain attention & speed in which the brain processes information. Librarians have the opportunity to offer an innovative service to promote student success through mindfulness.

pre/post questions

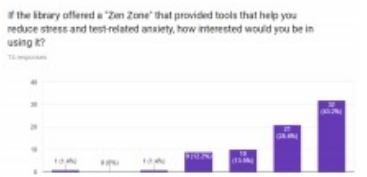
- How would you rate your current level of stress?
- How frequently do you practice mindfulness meditation?
- If the library offered a "Zen Zone," how interested would you be in using it?
- How long did you utilize the "Zen Zone" today?

discussion & conclusions

- Positive feedback from students
- Demonstrated less perceived stress
- Incorporating this as a library service or designated space would be a welcomed service

time for quiet

results



research objectives

- Evaluate the student's level of familiarity and current use of mindfulness practices
- Assess the student's perceived level of stress before and after Muse Meditation session
- Determine student interest in using meditative tools in the library

future research: zen zone

Survey results show that students would like to explore other mindfulness and meditative tools in the library. We are currently testing student engagement to additional tools in what has become known as a weekly "Zen Zone." Our goal is to have a permanent space in the library & circulate tools.

University Libraries
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- Helber, C., Zook, N.A., & Immergut, M. (2012). Meditation in higher education: Does it enhance cognition? *Innovation Higher Education, 37*, 349-358. doi:10.1007/s10755-012-9217-0
- Nicholson, S. (2004). A conceptual framework for the holistic measurement and cumulative evaluation of library services. *Proceedings of the Association for Information Science and Technology, 41*(1), 496–506.

Questions?

Everything on the slides is also available here:

https://www.swarthmore.edu/computer-science/senior-comprehensive-2021

The 60 second poster evaluation:

https://diversity.okstate.edu/departments/ok-lsamp/site-files/docs/research-symposium/60-second-poster-evaluation.pdf