

GOLD PAPERS

SPOTLIGHTING IMPACTFUL RESEARCH

SPRING 2022



ISSUE 6

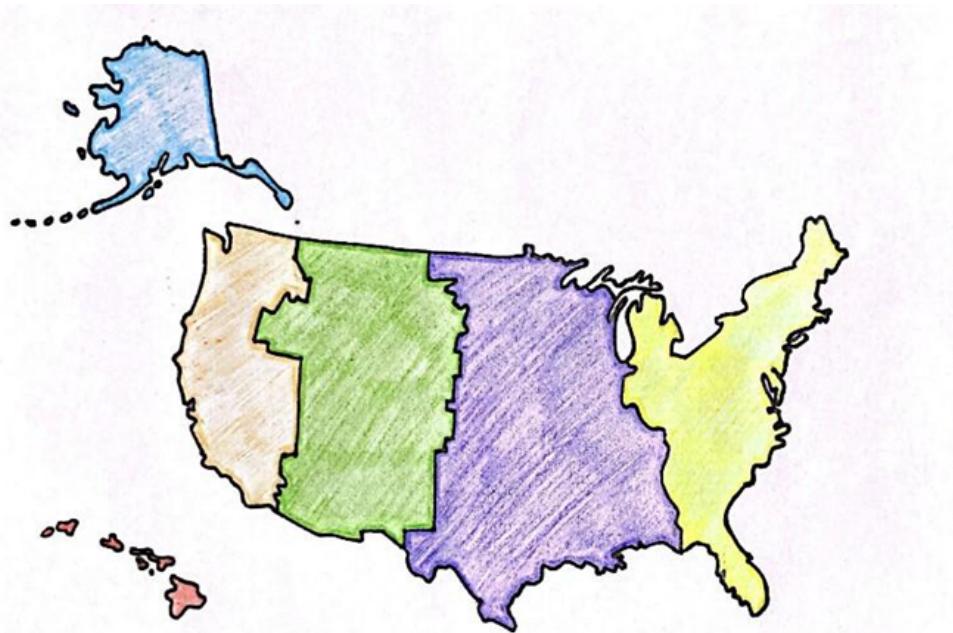
CSUGOLDPAPERS.BLOG

about the *Gold Papers*

From deep within the belly of the Food Science and Human Nutrition department at Colorado State University, came the idea for this project. A motley group of graduate students decided to clarify some of the confusion surrounding "health" while honing their scientific communication skills. This gave rise to the birth of the *Gold Papers*-a CSU flavored spinoff to White Papers, which aims to summarize current research and perspectives in their fields of expertise.

Should we abolish daylight savings time? Considerations from a sleep researcher.

By Sophie Seward, M.S.



On [Sunday, March 13, 2022](#), Americans collectively observed daylight savings time (DST) - *once again*. The spring seasonal change occurs when we shift our clocks from standard time to DST. The spring seasonal change is often accompanied by an unfavorable one-hour loss of sleep in exchange for an extra hour of daylight in the evening. However, the habitual observance of seasonal time change has recently come under attack in legislation. In fact, on March 15, 2022, a proposed federal law called the [Sunshine Protection Act](#) passed with [unanimous consent by the Senate](#) to make DST permanent beginning in 2023. If the House passes and President Biden approves the Act, Americans would no longer observe seasonal time changes. While the abolition of seasonal time change is widely supported, sleep experts argue that permanently setting our clocks to standard time instead of DST would be the best option for our health.

To better understand the debate, it is important to consider the origins of seasonal time change.

Although conceptualized in the 1700's, seasonal time change did not gain traction until the 20th century, when it was temporarily introduced during both World Wars as means of conserving electricity and fuel. Far from bolstering support for DST, later economic research found no significant impact of seasonal time change on [electricity and energy consumption](#). In the aftermath of both wars, staunch public backlash against seasonal time change led to its swift repeal. It was not until 1966, when Congress passed the Uniform Time Act, that seasonal time change was permanently adopted nationwide. This Act required all states to adhere to Standard Time and observe DST in the summer. However, states were allowed to exempt themselves from observing seasonal time change. For example, states like Arizona and Hawaii chose to not observe a switch to DST. On January 1974, President Nixon signed a law to make DST permanent. However, by February 1974, public approval dropped to [42 percent](#).

because Americans did not like the dark morning in the winter. By October of the same year, legislation was signed to reverse permanent DST.

Today, there is widespread support for the elimination of seasonal time change amongst politicians and scientists alike. The impact of seasonal time change on human health has been well documented over the past several decades. Changing our clocks to DST in springtime has been linked to [short-term sleep loss](#) in the days immediately following the shift. Sleep loss, even just in the short-term, wreaks havoc on our health. [Recent epidemiological evidence](#) suggests that for every hour that an adult sleeps less than seven hours, there is an 11% increased risk of developing heart disease. The short-term sleep loss associated with DST is linked to a spike in the number of [heart attacks](#) and [strokes](#) based on retrospective electronic chart reviews of emergency centers. Evidence suggests that there is anywhere between a [5%](#) to [17%](#) increase in heart attack hospitalization the week following the shift to DST. Conversely, following the transition from DST to standard time, which allows for an extra hour of sleep, evidence suggests that the rate of heart attacks declines.

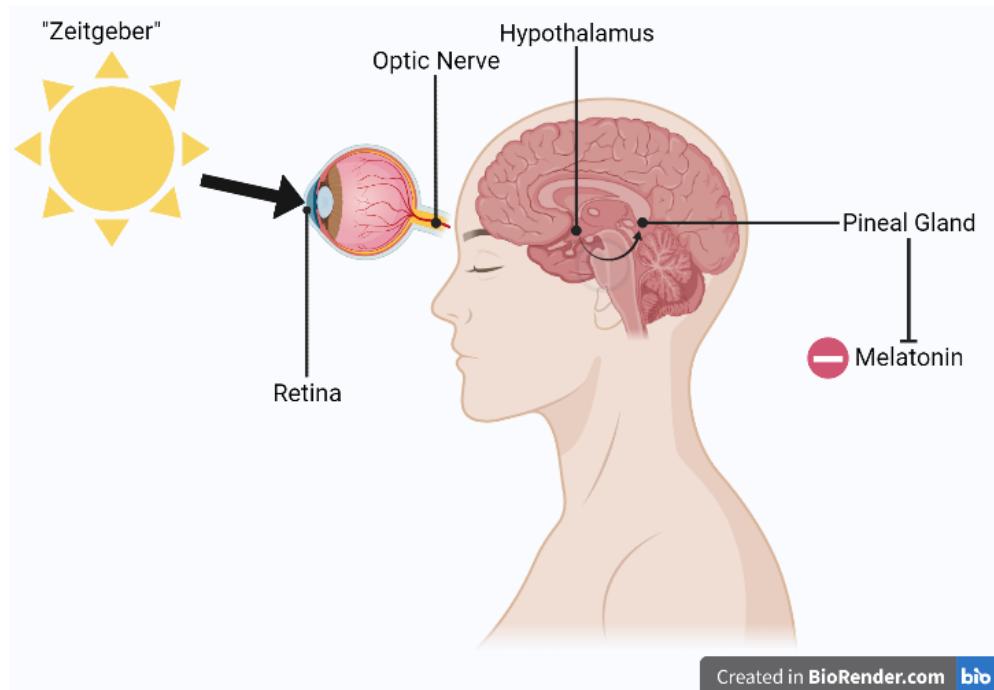
Sleep loss associated with the shift from standard time to DST also has profound implications for neurological and psychological health. Based on data analyzed from 1996 to 2017 in the United States, there is a [6% increase in fatal motor vehicle accidents](#) the week following the DST transition compared to other weeks throughout the year.

In contrast, the transition in the fall from DST to standard time has no effect on fatal motor vehicles accidents. Furthermore, seasonal time changes have been linked to mood disturbances and even suicides.

Based on suicide data in Australia, the week following the shift to DST was associated with an [increased rate of suicides in males](#) when compared to other weeks of the year. To a lesser severity, the week following the shift to DST has been linked to a decrease in work productivity and an [increase in cyberloafing](#) throughout the United States.

How can a one-hour time change incur such negative ramifications on our health and well-being? Our bodies have an internal timekeeper, known as a circadian rhythm, which tells us when we should sleep and wake. Light is the most robust external time keeper or "zeitgeber" that keeps our circadian rhythm aligned with the 24-hour rotation of the earth. In the presence of light, the retinas in our eyes process the light and send the signal via the optic nerve to our brains. In our brains, the light signal goes to the hypothalamus and transmits the signal to the pineal gland which suppresses the secretion of the hormone melatonin. Melatonin is a powerful hormone that promotes sleep. In the absence of light, melatonin is not secreted. Therefore, exposure to light in the morning and darkness in the evening supports our circadian rhythm. When we attempt to change our social clock (i.e. the time we go to work, school, activities, etc.) to be an hour earlier, our circadian clock becomes misaligned to our social clock.

The risk of seasonal time change is more pronounced in areas located on the western edge of time zones. [People on western edges of time zones](#) sleep on average 19 minutes less compared to their counterparts that live on the eastern edges of time zones. In fact, people who live on the western edge of a time zone have worse health outcomes including a higher incidence of cancer.



If DST were to remain permanent, western edge of time zones would not see the sun [until after 8am](#). This has significant impacts on our circadian physiology as we would not suppress melatonin before the majority of social clock obligations would begin.

However, the proposed solution to what time we should fix our clocks is under heavy debate. Specifically, some argue that Americans should fix our clock to permanent DST, as proposed by the Sunshine Protection Act, whereas others, including sleep and circadian experts, suggest that permanent standard time would be a superior solution. Based on the principles of circadian physiology, standard time aligns closer to the average circadian clock than DST.

The American Academy of Sleep Medicine put forth in a statement declaring that the "U.S. should eliminate time changes in favor of a national, fixed, year-round time. Current evidence best supports the adoption of year-round standard time, which aligns best with human circadian biology and provides distinct benefits for public health and safety."

In conclusion, legislation such as the Sunshine Protection Act to make DST permanent rapidly gaining traction in the United States. From the lens of a sleep researcher, laws to eliminate seasonal time changes are important to minimizing the one-hour sleep loss associated with seasonal time changes. However, the proposed permanent DST does not best support our circadian physiology. We should avoid making the same mistake of the past (recall 1974). Instead, we should be advocating for permanently setting our clocks to standard time for the best implications for our health and well-being.

The Gift of Giving Up

By Jen Felker

Nearly everyone's journey to becoming a physician starts with some variation of "I want to help people." From there, medical schools begin the indoctrination: Beneficence. Nonmaleficence. Autonomy. Justice. These are the four tenets of medicine that make up the essence of what it means to be a physician. However, there is little guidance on what route to take when these four virtues are in conflict. We aren't taught how to handle these situations in medical school and apart from legal stipulations hospital admin doesn't get involved. What should physicians do when the patient asks them to go against this oath? While working as a CNA at a community hospital, I witnessed many doctors face this question. "Anne" was a patient I knew who had advanced, aggressive pancreatic cancer. The same cancer her dad had died from just one year prior. She was young and, on the surface, appeared remarkably healthy due to a late diagnosis. Her family was not ready to let her go, so she fought. She fought with everything that she had until she didn't want to fight anymore. She requested to go to hospice to try to have the best quality of life possible for her remaining months, but her physician wouldn't give up on her. The doctor talked her into trying other treatments and when those failed, she tried to convince her to apply for a new trial. By the time she agreed she was rapidly declining and too sick to qualify. The doctor reluctantly approved her transfer to hospice, but she sadly died on the way there.

Many times, I've witnessed doctors get caught in the daily grind of doing everything possible to get patients from one treatment to the next without reflecting on how much they are taking from



them in the process. What would you give up for the promise of a few more months or years of life? Your autonomy, your dignity, your identity? We rarely ask less of cancer patients. There is a resounding no-quit culture in American medicine. It's not uncommon to hear "We're going to fight this! Screw cancer! You are strong!" At what point do we stop and say it's okay if you don't have the strength or energy to fight this, it's okay if you choose your dignity and identity over treatment, it's okay to give up? As Atul Gawande, an American surgeon and prominent physician-author, wrote in his book [Being Mortal: Medicine and What Matters in the End](#), "We've been wrong about what our job is in medicine. We think our job is to ensure health and survival. But really it is larger than that. It is to enable well-being. And well-being is about the reason one wishes to be alive" (2014, p. 259). The field of medicine has become so focused on scientific advancements and endless treatment options that the nuanced goals and wishes of each patient often become background noise. However, individual healthcare providers are only one cog in a very

In the US, hospitals are ultimately oriented around maximizing economic profitability. According to [Horwitz and Nichols](#), "Nonprofit, for profit, and government hospitals are all more likely to offer services when they are relatively profitable than when they are relatively unprofitable". It is often much simpler to present easily measured metrics (lifespan, disease incidence, adverse events) at board meetings than it is to place a numerical value on quality of life. How do we place an economic value on human dignity within our current system? Aside from the moral implications, it is easy to imagine how a physician may feel pressured to strive to improve the aspects of patient care that are directly measurable. Afterall conferences to address morbidity and mortality outcomes are commonplace, but there are no such thing as mandatory "well-being" meetings to ensure treatment plans are addressing patient's goals of care. The closes thing we have to this concept is the [Physician Quality Reporting System](#) that was introduced in 2007, and it has been the foundation for quality improvement in Medicare funded programs since then. However, these metrics must often follow strict guidelines with measurable positive clinical outcomes, which makes it difficult to incorporate measures like withdrawing treatment to improve patient quality of life and dignity. This has created a culture of pushing for more treatment even when it may not be in the best interest of the patient, which further complicates the question of what to do when the four tenets of medicine are in conflict.

Late one evening at the hospital I was speaking with an elderly woman who had been admitted for difficulty swallowing. Mary's personality was just as vibrant as her large red floral earrings and matching lipstick.

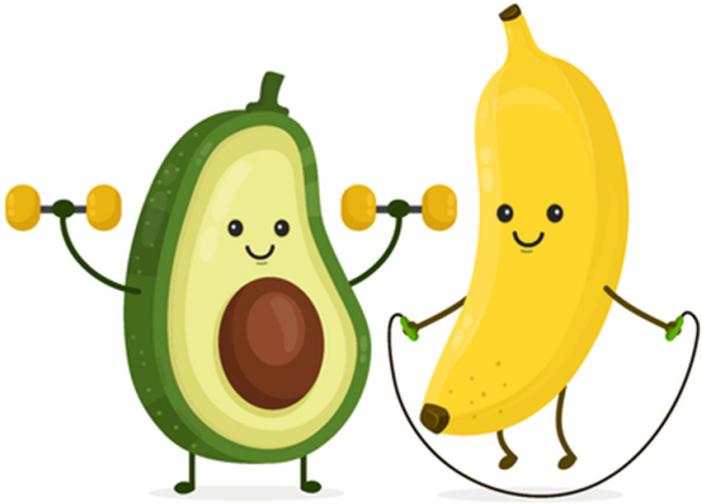
I sat with her for a while as she told me stories of her grandchildren and the amazing life she had as a nurse. The time came to transport her down for a CT scan and I waited with her afterwards to hear the results from the doctor. He walked in, sat down and calmly told her that they found a mass in her esophagus, and it was likely cancer. My heart sank as I waited to see how Mary was going to react. She took a deep breath, straightened her earrings and said, "I already beat breast cancer twice. I don't want to go through this again. I'm ready to go." A look of defeat and desperation crossed the doctor's face as he tried to explain that there were a variety of treatment options and that she should at least get a biopsy. Mary stood firm and said, "I'm too tired to fight this again. It's my time." The doctor stood up and said that he understood, but he left weighing 10 times more than when he entered. He carried the burden of not doing everything possible to prolong her life. He honored patient autonomy over beneficence, over nonmaleficence. He gave her the gift of giving up.

Physicians like this one need to be rewarded for putting patient well-being ahead of a measurable outcome, even if that outcome is death. Hospital administrations need to begin placing greater value on things we consider to be unmeasurable. Perhaps one way we change that is to develop a system that places a numerical value on dignity, relationship building and quality of life. Surveys and questionnaires exist in the world of clinical research that have been designed to do just that. One of these questionnaires is the [Health-Related Quality of Life](#) (HRQoL) assessment which measures the influence of a patient's disease and treatment on multiple aspects of their life including social

roles and general satisfaction. Right now, this assessment is mostly being used to determine efficacy of outcomes related to procedural treatments like coronary surgery. However, further implementation of the HRQoL into the healthcare environment could make the previously unmeasurable and non-profitable metrics definable and attainable. Furthermore, this implementation would allow physicians more freedom and support to encourage patients to evaluate what is truly important to them and to design a treatment plan to meet their needs, especially when what they need most is the freedom to let go.

Exercise—Your New Favorite Snack?

By Cat Lowry



Cardiovascular disease is the leading cause of death in the US. Even as a health scientist well-aware of the tremendous benefits of regular exercise, it's often challenging for me to find time for the gym. [Like many Americans](#), lack of free time amidst competing obligations can be a real struggle. The American College of Sports Medicine (ACSM) works with the CDC to publish [recommendations](#) for physical activity, and recommends that we get 150 minutes of moderate physical activity per week. However, this can seem like a daunting number, especially when we think about everything on our never-ending to-do lists.

Historically, ACSM has held that exercise must last at least 10 minutes in order to achieve measurable health benefits. Even though 10 minutes may seem like a short amount of time, it can still be challenging to reach.

This has prompted a change in the guidelines. Instead of placing rigid boundaries around what counts as an exercise session and what doesn't,

ACSM has hopped on the "[some is better than none](#)" train and removed this minimum requirement. In other words, any and all physical activity counts towards your weekly 150!

This change makes exercise more accessible to all, allowing those who were previously too busy to attempt a 10-minute exercise session to gain some real health and fitness benefits by adding just a few moments of physical activity into their day. By simply [moving more and sitting less](#), we can attain some of the same benefits as completing a whole exercise session. Now, you may be wondering, "how can I exercise in such a short period of time?" or maybe even "I work at an office all day, how on earth do I exercise there?"

The answer is simple—more snacks! But not just any kind of snacks, exercise snacks!

So, what exactly are exercise snacks? Exercise snacks are small bouts of exercise, typically less than 1 minute in duration, performed throughout the day. Pacing while on the phone, taking the stairs, or simply taking a walk around the office are all ways to fit in more physical activity into your day. The best part? Science actually shows us that exercise snacks are not only good for us, but that they can also lead to significant improvements in both health and cardiovascular fitness.

Increased levels of physical activity have shown to [reduce](#) cardiovascular disease risk and disease status. However, those unable to perform a "typical" 30-minute exercise session may worry

that these benefits may not apply to them.

Fear not! Exercise snacks have shown to improve multiple markers of cardiovascular health, such as increased blood flow. Increased blood flow allows oxygenated blood to continuously flow throughout our body, keeps our brain functioning at tip-top shape, and can even help boost our [immune system](#).

Exercise snacks can also help improve our cardiorespiratory fitness. In a [study](#) conducted in Canada, researchers investigated the effects of completing a 60-step stair sprint (equivalent to roughly 3 flights of stairs) on cardiorespiratory fitness. They found that completing just 3 bouts of stair sprints a day for 6 weeks significantly improved multiple measures of cardiovascular fitness. Another [study](#) investigated the effects of 20-second cycling bursts throughout the day and found all markers of aerobic fitness significantly increased for the exercise snackers.

It may not always be realistic for us to complete a traditional 30-minute exercise session. During busy times, such as finals week, our focus on school or work may make it challenging to fit in exercise. Exercise snacks celebrate what exercise should be: accessible, customizable, and fun! By removing “minimal requirements,” ACSM has made great strides in making exercise more accessible to a large portion of the population. For example, it can be expensive to join a gym or attend weekly workout classes, but taking a lap around the office in between phone calls only costs a few moments of your time. Or, maybe going for a jog or pounding the weights (things we typically think of as “traditional” forms of exercise) isn’t your jam.

That’s totally okay! The beauty of exercise is that

it’s customizable to whatever you love to do. Maybe you love yoga, but don’t have the time or funds to attend as many classes as you’d like. Simple solution—snack on it! There are plenty of yoga poses which can be modified to be desk or chair friendly. Exercise should be fun, and [we’re more likely to do it](#) when we enjoy it!

This week, make it a goal to celebrate the fun in exercise and challenge yourself to try out some tasty exercise snacks! Not only can exercise snacks give your health and fitness a boost, but studies show that exercise may help [increase productivity](#) as well. Here are a few of the many different ways you could incorporate exercise snacks into your day:

- Choose a slightly farther parking spot! Walk briskly from your car to your destination and repeat when you return to your car.
- Take your phone calls on the go! Instead of sitting at a desk during your phone calls, try walking or pacing. If the weather is friendly, take your calls outside for a breath of fresh air!
- Take the stairs and try adding in some speed! A good way to start is by adding a quick stair sprint when you arrive at work or school and then before you leave for the day (bonus points if you can fit one in on a lunch break too!).

Regardless of how you choose to move more, know that anything you do is better than nothing. Exercise is a celebration of what our amazing bodies can do, and you should do what moves you the most! Like to dance? Try adding a dance break during TV commercials! Fond of jumping jacks? Pick a door in your house and try doing a few each time you walk through it! Exercise does not have to be complicated, and exercise snacks further allow us to incorporate exercise into our (busy) everyday lives.

Is Breakfast the Most Important Meal of the Day?

By Kieran Abbotts

"Breakfast the most important meal of the day, breakfast served up Gary's way." – SpongeBob.

Many people skip breakfast. Sometimes by choice, sometimes by circumstance. Whether you are or aren't a breakfast person, I am sure you have seen or heard someone extoll the value of having or skipping the morning meal. Likely the importance of breakfast depends on your personal goals (health, performance, satiating the hunger monster, and so on) and what you are eating (eggs, cereal, or ice cream). But regarding the importance of the meal in general, many questions remain. Will skipping my morning muffin cause obesity? Will trashing my bagel and egg sandwich allow me to reach my Olympic potential? Let's dive in.

When looking at the science, the jury seems to be out on the benefits of skipping breakfast. Some epidemiologic evidence indicates that skipping breakfast is associated with a higher body mass index (BMI) and a higher prevalence of chronic diseases such as obesity and [type 2 diabetes](#). Easy enough, don't skip breakfast... Well, it might not be that simple. Epidemiologic studies are great for finding correlations or associations between variables. However, such correlations and associations can be confounded by many variables like variation in socioeconomic status and volume of daily physical activity. It is important also to examine the results of laboratory studies where external factors are more easily controlled.

Meta-analyses are one way to do just that. They analyze the results of many laboratory studies and try to draw conclusions based on the results of these studies. These two in particular ([here](#) and [here](#)) examined the effects of eating breakfast on body mass and composition. They found that skipping breakfast resulted in slight reductions in body mass. These reductions, while small, might point to the idea that skipping breakfast can be beneficial regarding weight loss. Importantly, in both studies, the authors note that skipping breakfast without the context of overall caloric restriction and improvement in diet quality does not induce weight loss or improvements in health for individuals.

Reducing body mass results from energy expenditure being higher than energy intake. You might be asking if you are skipping breakfast, aren't you reducing energy intake? Not necessarily. There is potential for increased caloric consumption later in the day at future meals. If you skip breakfast but are famished at lunch, maybe you eat twice as much then or reach for an extra snack later. Relating to the authors' point regarding healthy decisions, skipping breakfast doesn't afford carte blanche to eat whatever you want later. Without improvements in dietary choices, skipping breakfast may not lead to improved health.

Further, there could be changes that impact your energy expenditure. Energy expenditure comprises several components, the largest of which is resting energy expenditure (number of calories burned just keeping them alive). How might skipping breakfast impact that? Apparently,

not all that much. Researchers in the United Kingdom found that "extending the overnight fast" does not alter one resting metabolic rate beyond changes predicted by gaining and losing [weight](#). The second-largest component of daily energy expenditure is the number of calories burned through regular physical activity. One group of investigators found that this number was higher in lean individuals who consumed [breakfast](#). Interestingly, there were no changes in resting energy expenditure, suggesting that these individuals were simply moving more.

Another component of energy expenditure is diet-induced thermogenesis (DIT), also known as the thermic effect of food. DIT is the increase in energy expenditure (calories burned) caused by the metabolic processes required to digest food and accounts for roughly 10% of one's total daily energy expenditure. While consuming breakfast would result in increases in DIT, these increases are unlikely to offset the increased energy intake from consuming another [meal](#).

One last component of daily energy expenditure is exercise. This is slightly different from physical activity thermogenesis, in that this is exercise one chooses to do, as opposed to having to do as part of daily living. So, what about those of us who like to exercise? Does breakfast matter for us? There is some evidence that the omission of breakfast could reduce exercise performance throughout the [day](#). This could result from multiple factors, including hepatic glycogen (glucose linked together in your liver that can be broken down and distributed throughout the body to be used as energy) depletion, and reduced energy availability from having no food. Still, not everyone is trying to maximize their performance. Some of us exercise for health, and

there is not much concrete evidence showing that the omission of breakfast leads to individuals being less healthy.

Given this lack of clarity, you might be asking, should I ditch that oatmeal and opt for a large cup of nothing? The answer, at this point, is to do what you prefer. To the best of our knowledge, the answer appears that it is not all that important whether you need your morning oatmeal or stick with a cup of black coffee.

What is ultimately more important is that you are eating nutritious foods, getting plenty of physical activity, and making other healthy decisions throughout your day.



The Science of Dating: A Numbers Game?

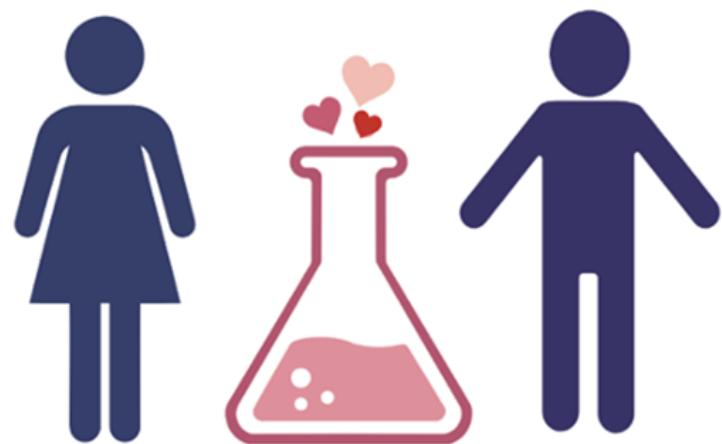
By Megan Mazzotta

The other day my friend called to catch up and our conversation quickly turned to dating and the ever-interesting interactions between courting partners. She was baffled at how I was able to find a boyfriend who was "down for a monogamous relationship." This statement puzzled me, but before I had the chance to chime in, she said, "oh well, must be the men at CSU, the guys here in Boston are just a different breed." At first, I did not think much about her comment, but upon reflection, I couldn't help but wonder if there was any truth to what she said. So, I did what anyone would do and turned to the "expert"- Google. After scrolling through dozens of Buzzfeed-like articles, I came across a book titled "[Date-Onomics](#)" authored by Jon Birger, a business analyst and award-winning magazine writer. In his book, Birger analyzes the dating culture of college campuses to investigate the same question my friend posed in our conversation on the phone- where have all the good men gone?

The [dating scene has changed](#) immensely since the early 2000s. In fact, according to a Pew Research Center [survey](#) conducted in October 2019, "nearly half of U.S. adults say that dating has gotten harder in the last 10 Years". Some attribute such changes to the implementation of the internet in courtship while others note an increasingly hesitant attitude towards marriage, monogamy, and commitment among younger individuals. As traditional dating has declined on college campuses, hookups —casual sexual encounters often initiated at alcohol-fueled,

dance-oriented social events— [have become a primary form of intimate heterosexual interaction](#). The rise of hookup culture has not eliminated interest in or experience with committed relationships, but it has perhaps made forming these relationships more challenging.

So, what is really fueling this transition to hookup culture? As it turns out, it may be a simple numbers game. Jon Birger found that "the emergence of [modern hookup culture](#) has little to do with Tinder or porn or Facebook or anything else modern scolds like to blame and everything to do with today's lopsided sex ratios among college grads". His research, and the research of several other social scientists, suggests that an oversupply of women on college campuses gives men more power in romantic and sexual relationships, which translates into [lower levels of relationship commitment](#).



This phenomenon has been dubbed the [dyadic power thesis](#) and describes how the minority gender in a community may obtain more power in their heterosexual relationships due to the relative scarcity of their gender. Furthermore, when men specifically are in the minority and thus have more dyadic power, women tend to give more [negative appraisals of men](#), go on fewer traditional dates, are less likely to have a college boyfriend, and are more likely to be sexually active.

So, what does this mean for students at Colorado State University? Data from the Spring of 2022 shows that CSU has a total undergraduate enrollment of 22,247, with a gender distribution of [44% male students and 56% female students](#). This kind of variation is far from uncommon for universities in the United States. Indeed, recent statistics indicate that women make up [60 percent](#) of the student body at institutions of higher education, while only fifty years ago, the [gender proportion was reversed](#). More women seeking romantic relationships leads to women having fewer available partners and thus, may be less likely to establish committed, long-term relationships. Therefore, women face two problems: there are less men available for relationships and when they enter into a relationship with a man, they are less likely to hold power in that relationship.

Some research suggests that this power shift may lead to problematic social outcomes that transcend behavior on college campuses. For example, [teen pregnancy and the number of sexual partners](#) held by women are both higher in countries where men are scarcer. Cross-national data also reveals that high sex ratio societies (i.e., those with a higher number of men

per woman) have [lower divorce rates](#) whereas countries with higher sex ratios have [higher marriage rates](#) and lower nonmarital fertility rates.

This stated, such a heterosexually myopic approach to analyzing the inner workings of modern dating is not without important limitations, as it does not account for individuals within the LGBTQ+ community. Because non-heterosexual relationships may not abide by the [heterosexual gender dynamics](#) assessed in many studies to date, the power dynamics described above may not apply in the same manner. Research focusing on the LGBTQ+ communities on college campuses has found that successful dating practices are heavily reliant on the use of [mutual friends](#) as potential romantic partners. Future research should investigate how non-binary gender identities and non-heterosexual dating relationships differ from heterosexual ones.

Despite current limitations, analyzing the gender ratios of those enrolled in university may help to provide an explanation for changing social norms surrounding dating relationships and the rise of hook-up culture. This, however, is an ongoing area of research with layered complexities that can seem enigmatic as we attempt to understand the intricacies of interpersonal romantic relationships between individuals of all identities.

So, the next time my friend calls me up wanting to "talk men," I will not be running the numbers to analyze gender ratios in her area. Instead, I might share that despite all efforts to understand it, dating is not an exact science.

Contributors

Kieran Abbotts is a second-year master's student in the Department of Health and Exercise Science. His research interests are broad but tend to fall in the areas of exercise physiology and metabolism. When not in the lab conjuring potions and performing black magic, Kieran enjoys downing his morning cup (or three) of coffee and then getting outdoors to run, hike, bike, and so on.



Jen Felker is a first-year medical student at the University of Colorado School of Medicine at Colorado State University. When she's not doing endless amounts of flashcards, she enjoys spending time with her husband and two fluffy dogs. Jen is passionate about exploring the grey areas of medicine in hopes of improving quality of care outcomes.

Cat Lowry is a first-year graduate student studying sleep and metabolism. When Cat isn't working in the sleep lab, she loves adventuring and getting outside. Cat also does gymnastics on top of horses (better known as equestrian vaulting) and has competed all over the world!



Megan Mazzotta is a first-year medical student at the University of Colorado School of Medicine at Colorado State University. When she is not sitting on her couch studying for her next test, she enjoys sipping on tea and going for a nice hike. Megan strives to make science accessible, palatable, and fun for the everyday person.



Sophie Seward is a doctoral student in the Sleep and Metabolism Laboratory. Her research is focused on the cardiovascular effects of sleep and circadian disruption. Sophie enjoys running marathons and she is passionate about science communication.

Raj Trikha graduated with his Master's of Science in Human Nutrition in May of 2020. Last fall, he began medical school with aspirations of working in academic medicine one day. His goal is to communicate the science of health care to the general public.



Luke Whitcomb is working towards his Master's degree in Biomedical Science, researching metabolic dysfunction in heart and muscle cells. His interests lie in reducing the burden of chronic disease and combating health care inequity - as well as understanding how those two are linked. He plans to go on to medical school to pursue physician training, medical research and leadership in health care policy reform. In his free time, he enjoys black coffee, quirky podcasts and fast longboards.

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