BISV The Scope

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A Letter from the Editorial Team

Welcome to the Eighth Edition of the Scope! We are excited to wrap up the school year with our 2025-2026 spring publication, continuing to be an interdisciplinary research journal that covers diverse student research, as well as articles written by our editorial team about recent developments in research in both STEM and the humanities. Our team, with new members and old, has done well this year, bringing a wide range of new ideas to our journal.

A special thank you to all students who submitted papers, especially Mr. Meyerowitz and the Existentialism Capstone. Congrats to everyone, and the team hopes that they continue successfully within their research field!

This year was the first year that we accepted middle schoolers onto our editorial team, and they have done marvelously, providing ideas that connect with both the younger and older students at BISV. We have seen so much growth research from our school from the younger students, and they deserve to get recognized for their hard work as well!

We aim to continue our mission of showcasing the amazing talent at our school while inspiring others to take part. We hope to lead the way and encourage our Bobcats to eagerly share and contribute their research in order to help benefit and introduce others to the possibilities beyond just what we learn in class. The editorial team will see you again next year!

Always looking forward,

Dr. Karen Allendoerfer - *Scope* Advisor
Aanya Gupta - Co-Editor-in-Chief
Vedh Reddy - Co-Editor-in-Chief
Iris Li - Co-Editor-in-Chief
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Science In The News

Google's Gemma 4: Open-source AI Gets a Serious Upgrade

Vedh Reddy

On April 2, 2026, Google DeepMind released Gemma 4, the latest version of its open model family. Unlike Google's flagship Gemini 3 system, Gemma 4 ships under the Apache 2.0 license, meaning developers can download, modify, fine-tune, and deploy it commercially without paying royalties or asking permission. The release matters because it puts strong reasoning on hardware that doesn't require a data center.

The lineup includes four model sizes. The E2B and E4B variants are designed for phones and edge devices. They activate roughly 2 billion and 4 billion parameter footprints during inference, which keeps RAM and battery consumption low. The 26B Mixture-of-Experts (MoE) model targets consumer GPUs by activating only about 3.8 billion parameters per token while routing through a much larger pool. The 31B Dense model is the high-end option, intended for workstations and cloud serving (Farabet and Lacombe, Google DeepMind blog, April 2, 2026).

Benchmark numbers tell the story. On AIME 2026, a competition mathematics test, the 31B model scored 89.2 percent. Gemma 3 had scored only 20.8 percent on the same test a year earlier. On Codeforces competitive programming, ELO jumped from 110 to 2150, which appears to be the largest single-generation leap for any open model tracked publicly. The 31B currently sits at number three on the Arena AI leaderboard among open models, while the 26B MoE holds sixth place despite running on roughly an eighth of the active compute.

The architectural approach behind these numbers is what people are talking about. Google trained Gemma 4 from the same research base as Gemini 3 but optimized for what they call intelligence-per-parameter. The 26B MoE reaches about 97 percent of the 31B's quality at roughly 8 times less compute per inference step. Percy Liang, who directs Stanford's Center for Research on Foundation Models, framed the result this way: "What Gemma 4 demonstrates is that the parameter count arms race may be reaching diminishing returns. Google has shown that architectural innovation and training efficiency can deliver frontier performance at a fraction of the compute cost."

Beyond raw scores, Gemma 4 was built for agents rather than chat. The models support 256K context windows, native vision and audio input, function calling, structured output, and over 140 languages. Google's edge team specifically designed the smaller variants to run multi-step autonomous workflows offline. An Android developer can now ship an app that handles multi-step planning without a network connection, since Gemma 4 forms the base for the upcoming Gemini Nano 4.

Some context on the competition matters here. Meta's Llama 4, DeepSeek V4, Alibaba's Qwen 3.5, and Mistral's latest releases have made the open model space crowded and fast-moving. Gemma 4's 31B beats Llama 4 Scout (109B total) on GPQA Diamond by about ten points, although Qwen 3.5 still leads on coding benchmarks like SWE-bench. The takeaway is not that any single model has won. It's that open weights at the 30B scale now match or exceed proprietary systems from twelve months ago.

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2025 Physics Nobel Prize Winners

Iris Li

The 2025 Physics Nobel Prize was awarded to John Clarke, Michael Devoret, and John Martinis for their discovery of macroscopic quantum mechanical tunneling and energy quantisation in an electric circuit.

MQT stands for macroscopic quantum tunneling, and physicians before this time have attempted to use Schrodinger's equation to solve for it. However, because quantum physics allows for other types of many-particle states, the measurement that distinguishes two states would collapse the superposition for all particles. These states, termed "cat states", are particularly sensitive to interactions with their environment. Schrodinger's cat demonstrated that the environmental interactions lead to the rapid decay of quantum state superposition, suggesting the incongruity of quantum physics at the macroscopic level.

A smaller version of Schrodinger's cat experiment was performed as well, and the Josephson junction, which contains two superconducting leads separated by an insulating tunnel barrier, was studied. It allowed for the quantum mechanical, but not the typical, particle to tunnel out of the local minimum. The catch to this model, though, was its bias in controlling nonlinear electrical conditions.

At the time, Clarke had been working on superconducting junctions and their applications. At the University of California at Berkeley, he and his students, Martinis and Devoret, set up a series of experiments that would confirm the existence of MQT. They used a filter chain, copper powder microwave filters, and thermally anchored the filter chain at different temperature stages of the cryostat (a vacuum device that maintains low temperatures). The black body radiation from the filters is emitted at the temperature of the filters. There was also a weakly coupled microwave control line, which allowed for the determination of the junction's plasma frequency.

This experiment, along with others, proved that a superconducting circuit of decent size could be isolated well enough to observe both energy quantization of a macroscopic degree of freedom as well as MQT out of a stable state.

Groups later used their research on superconducting circuits to conduct their own. For example, the circuit Quantum Electrodynamics came along, where a qubit circuit (a model of quantum computations), was paired with a microwave resonator. Today, there is also a qubit design called the "Transmon," which is insensitive to charge noise, and is being used to try to create a large-scale quantum computer.

Outside of qubits, these circuits have also impacted quantum optics, in which new artificial atoms are designed, allowing for deeper studies in the field.

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March Mammal Madness, an Honors Biology Tradition

Iris Li

What is March Mammal Madness? It is a month-long bracket-like competition, much like college basketball's March Madness. The more correct animal matchups you get, the more points you are awarded.

MMM was an approach towards improving science education, as students are able to look up the biological facts, such as what defense mechanisms the animal has. Alongside the bracket, MMM also announces results through Twitter threads and YouTube videos. These videos are often very humorous, as Hinde says, "Humans are psychologically and cognitively adapted for fireside storytelling, shared experiences, artistic imagery, and jokey-joke-joke-jokes." This humor is used to help the lessons regarding these animals stick, drawing in students from all backgrounds into ecology.

This isn't only educational for the students, though; the team behind the MMM every year has to go through multitudes of scholarly works to justify the results of each matchup.

March Mammal Madness has been a longstanding tradition as part of Dr. Allendoerfer's Honors Biology Class. Students fill out their bracket in late February to Early March, and aren't able to edit their picks after. After doing so, they receive updates on standings every time a new set of results comes out. Students who win in their respective class periods receive a mammal eraser from Dr. Allendoerfer. If you ever feel like you're in search of a small educational experience, whilst looking for fun, try it out!

Tiny Fossils Reveal a Lost Human Species

Momo Tu

In a groundbreaking discovery, scientists identify a previously unknown species of ancient human in the Philippines named Homo luzonensis, reshaping our knowledge of human evolution. Unearthed from Callao Cave on the island of Luzon, this hominin lived tens of thousands of years ago and adds a fascinating twist to the story of how early humans evolved and expanded across the globe.

The first bones were discovered in 2007 during excavations at Callao Cave, but it wasn't until further digs in 2011 and 2015 that researchers recovered enough remains to reveal the presence of a distinct species. Scientists found 13 fossil elements in total — including teeth, finger and toe bones, and a child's femur — from at least three individuals. These remains were dated to between roughly 50,000 and 67,000 years ago, placing Homo luzonensis squarely in the Late Pleistocene alongside other early humans such as Homo sapiens, Neanderthals, and Denisovans.

What makes Homo luzonensis particularly intriguing is its unique combination of physical traits. Some aspects of its teeth resemble those of relatively modern humans, with very small molars, while other features are surprisingly primitive compared to other species living around that time. For instance, the finger and toe bones show strong curvature, a trait more commonly seen in ancient hominins like Australopithecus, suggesting potential climbing capabilities. This mosaic of features does not match any previously known species, leading researchers to recognize it as a new member of the genus Homo.

Although the fossil sample is small, scientists estimate that Homo luzonensis was short in stature, possibly less than four feet tall, similar in size to another diminutive species, Homo floresiensis, discovered on the Indonesian island of Flores. These two species raise compelling questions about how island environments influenced human evolution — a process sometimes referred to as insular dwarfism, where isolation leads to smaller body size over generations.

The discovery of Homo luzonensis has significant implications for human evolutionary history. First, it challenges the conventional view of a linear progression from primitive to modern humans, revealing instead a diverse branching tree with multiple hominin species coexisting in different regions. Second, the fact that Homo luzonensis lived on an island that was never connected to the Asian mainland indicates that early human relatives were capable of sea crossings, whether by accidental rafting on debris or intentional navigation — long before modern humans are believed to have voyaged across oceans.

Despite these revelations, many questions remain. Scientists have been unable to extract DNA from the fossils due to their age and the tropical conditions in which they were preserved, leaving unanswered questions about how Homo luzonensis is related to other species. Moreover, recent studies suggest that the species might be even older than previously thought, potentially dating back more than 130,000 years — a timeline that further complicates our understanding of hominin dispersal in Southeast Asia.

In addition to the discovery of Homo luzonensis, a new species was discovered in the Philippines

The discovery of Homo luzonensis highlights the complexity and richness of our evolutionary heritage. Far from being a straightforward story of gradual progress, human evolution appears to involve a variety of species with diverse adaptations, living in regions once thought inhospitable or inaccessible. As researchers continue to study these fossils and search for more evidence, each new find adds depth to the narrative of where we come from and how our ancestors adapted to life across the ancient world.

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Creativity.exe

Vibha Santhanakrishnan

Introduction

AI. You’ve probably used it for your chemistry homework. Some doctors use it to decide which patients to treat first. Some even sell AI artwork as commissions. Naturally, with an omniscient, omnipotent entity, there’s an impact on humans’ critical thinking, problem-solving, and many more aspects of life. Recent scientific developments indicate that AI is reshaping human creativity on an unprecedented scale.

There is ongoing debate about whether AI's impact on creativity is ultimately positive or negative. Humans may rely less on generating ideas independently, but could be redirecting creative energy toward new tasks (like prompt engineering) to extract more refined ideas from AI.

Positive Views

James C. Kaufman of the University of Connecticut Neag School of Education argues that while AI can generate ideas, the creativity lies in human judgement. His views arose as a result of his research, where participants were evaluated on their creativity both with and without AI assistance. The results showed that individuals who were already creative on their own became even more creative when using AI. Therefore, Kaufman is optimistic that AI can serve as a tool that amplifies human potential, instead of overtaking it.

Some more theoretical views include that of Capitol Technology University, Wharton at UPenn, and Fang et al. who argue that AI serves, and doesn't replace human creativity. Often I see argued that AI boosts productivity and quality, and should be seen as a supportive tool rather than a competitor.

Negative Views

However, some argue that AI has a negative impact on cognition, and that its usage reduces diversity of ideas. On the cognition aspect, researchers at MIT investigated the cognitive development of using LLMs like ChatGPT in essay-writing. They split participants into three groups (brain-only, search engine, and LLMs) and then had them write 4 essays. For the fourth essay, some participants switched groups. Overall, the researchers found the lowest neural engagement for those who used LLMs to write, and found the lowest cognitive development for LLM users who switched to search engine or brain-only. LLM users also seemed to have lower recall, less engagement, and lower sense of ownership of their writing.

A study about humans working with AI on the AUT (a test asking about the different ways you can use an object) had similar conclusions; AI can be used to amplify human creativity, but then qualitative results showed that the humans had less ownership of the answers and felt like they didn't contribute at all. So, even though AI can increase the quality, it still doesn't help individuals develop their own independent creative thinking skills.

Another negative argument I see is that AI-based decisions are less diverse, and that solely relying on AI ideas means that the uniqueness of them is lost. GenAI outputs will always be more narrow than those that are human-based, with brainstorming and collaboration.

The Battle: AI v Humans

Rather than asking how AI influences humans, some researchers ask a more direct question: how does AI creativity actually compare to our own? Research at Purdue shows that both humans and AI have "narrow creativity", with neither exploring the full range of possible ideas. They found this through the circles exercise, which involves creating art with previously-drawn circles. However, one difference the research found was that humans produce fewer, recognizable concepts, while AI generates more ideas more quickly. This sort of contradicts the argument earlier that AI ideas are less diverse. However, the researchers remarked that even though AI generates more outputs, it doesn't break into radically new idea spaces, mostly recombining existing patterns rather than inventing fundamentally new ones.

Another study from the University of Montreal showed that generative AI can now outperform the average human on certain creativity tests, but the most imaginative humans are still far ahead overall. Some measurements of AI, like temperature (which increases randomness of the next token chosen as output), can be tweaked to generate more creative responses.

To maximize AI's creative responses, a framework EARTH was proposed by researchers at the University of Warwick and Wuhan University of Technology. It proposes 5 steps: error generation, amplification, refine selection, transform, and harness feedback. The pipeline employs a composite reward function based on novelty, surprise, and relevance, and it was able to make AI design slogans that were over 40% more novel than without the framework.

Conclusions

Overall, AI's impact on human creativity has mixed views; some believe it's a positive amplifier, some believe it's lowering cognitive development. Some are evaluating humans and AI side-by-side. One thing is certain: the most creative question we'll face isn't what AI can make, rather it's what we choose to become alongside it.

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Developments in Multimodal AI

Nathan Chen

In the past few years, AI chatbots like ChatGPT garnered massive popularity for its ability to help users with writing or answering questions efficiently. However, these AIs were also specialized for only one type of input and output. ChatGPT can take a text prompt and output a piece of text using natural language processing, but it could not analyze or generate a video alongside it.

Recently, AI models have rapidly become multimodal, which means that they can process text, audio, images, and videos at the same time. For example, OpenAI has stated that they will start to integrate Sora directly into ChatGPT. In this way, users will be able to have ChatGPT generate

both text and videos in the same session. Unlike using Sora and ChatGPT separately, this is not only more convenient but also allows the model to remember and reference information from previous output, making its generation better meet the user's demands. Google has also implemented multimodal AI in its Google Multisearch, which lets users search using both images and text. This is helpful because the AI will more accurately know what the user wants and provide more relevant search results.

Multimodal AI works by first taking each input (text, audio, images, and videos) and converting them into numerical, machine-readable vectors with specialized encoders: transformers are used for text, convolutional networks for images, etc. Then, a fusion module combines these vectors into a shared representation so the model can identify relationships between different inputs, such as matching words in a text prompt to different objects in an image. Lastly, a decoder will use all the information together to generate output.

Multimodal AI will have a big impact on society by making AI models more engaging. Studies have shown that people prefer social video platforms like TikTok over traditional TV because they are more interactive. Likewise, multimodal AI allows users to use text, images, audio, and videos together. This creates more interactive experiences than just reading text from chatbots, which can potentially help fields such as education as multimodal AI are more personalized and immersive for the user.

Furthermore, multimodal AI has applications in STEM industries as well. In healthcare, they can analyse imaging together with patient histories, letting doctors be more efficient and thus detect harmful diseases like cancer earlier. In robotics, they can combine vision, sound, and tactile feedback to better traverse complex environments. While unimodal AIs can also process multiple types of data. However, they analyse each of them separately, so they cannot pick up on the relationships between the different types of data. On the other hand, multimodal AI looks at all the data together, so it also sees the relationships between them which make it predict more accurately.

However, there are some drawbacks to multimodal AI. Combining a lot of data together needs careful data curation. Otherwise, even a minor inconsistency such as a labeling error could cause the model to make incorrect predictions, which can have serious consequences in fields like healthcare. Moreover, multimodal AI needs much more computational power and memory than traditional models, which already require a lot. Thus, they would be very expensive to use. Finally, some types of input may dominate the model making it skewed. If the model is trained on a lot of text but few images, audio, and videos, it may rely too much on text and not look at the other inputs, making it miss important context.

In conclusion, multimodal AI will be a huge improvement to AI. Although it runs into issues like cost and bias, its ability to combine multiple types of information is very useful and can be applied to many different fields to increase accuracy and efficiency.

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AI in Physics

Fred Sun

Ever since its conception, artificial intelligence (AI) has shown extreme viability as a frontier for technological development in all areas. Now, AI has taken many forms, but their main idea still remains as function approximators, acting as maps between inputs and outputs. These machines are promising in approximating very complicated maps, which would be tedious with normal numerical/computational methods. AI relies on the principle that doing a large amount of simple calculations is far easier than doing a lesser amount of difficult calculations, and in the limit that the amount of simple calculations done becomes very large, the idea is that AI will be able to approximate anything to sufficient degrees of accuracy.

In physics, AI becomes extremely important in providing feasible computational methods for various systems. The laws that govern the processes in these fields are all partial differential equations, oftentimes nonlinear, which are in general very difficult to solve. These equations differ from algebraic equations in that their solutions are not numbers but functions themselves; they ask, "What function satisfies this (calculus-based) relationship?" Some examples include Navier-Stokes' equations and certain cases of Schrodinger's equation. AI becomes a promising tool in solving these equations, where numerical methods could be inefficient or fail to capture precise nuances of the solutions. With the production of large-scale AI models being readily available through computer innovations, anything is possible.

Physics Informed Neural Networks (PINNs) have become the leading method in solving difficult partial differential equations. Like any other equation, a partial differential equation may be very difficult to solve, but once a solution is obtained, it's essentially a matter of plug-and-chug to verify its validity. A PINN guesses a solution, and plugs it back into the original equation; it'll get something like a = b where a does not equal b, and it measures their difference, taking that as its error. As one trains the neural network, they try to adjust it so as to minimize that error, eventually being able to reach arbitrary precision. This whole process bypasses whatever inaccuracies and difficulties a numerical method might have. Specifically, numerical methods rely on simplifying the equation into something a computer could compute (most commonly, repeated arithmetic), which serves as an approximation; as the granularity decreases, and the volume of computations increase, these approximations get closer to the actual solution. A PINN does not try to propose an approximation, but a complete solution (even if that solution is going to be somewhat wrong and therefore is an approximation). It does so quickly, with advancements in computer methods making neural networks able to achieve quick runtimes. In many cases, PINN methods beat conventional numerical methods in solving partial differential equations, highlighting their viability in computing physical phenomena.

PINNs are also able to beat other neural network archetypes at solving these equations by being able to leverage physicality in the solution of equations. For example, physics has many underlying laws, like conservation of energy, momentum, (non-relativistic) mass, etc., which guide its processes. A brute force neural network which compares its outputs to a large preset database (known as the ground truth) that attempts to solve these equations would spend a lot of time producing inaccurate solutions that violate some of these laws substantially. Not only do PINNs not need a large ground truth, but also by incorporating deviation from these laws as part of the error needed to be minimized, they rapidly reject a large subset of possible solutions that are simply unphysical. This greatly reduces the overall amount of possible outputs a PINN could produce, and allows it to achieve extremely accurate results with much less training. With tying PINNs back to physics, these neural networks provide extremely useful solutions in an extraordinarily fast manner. Thus, the

“physics-informed” part of a PINN separates it from other neural networks and allows it to solve physical systems much more efficiently and effectively.

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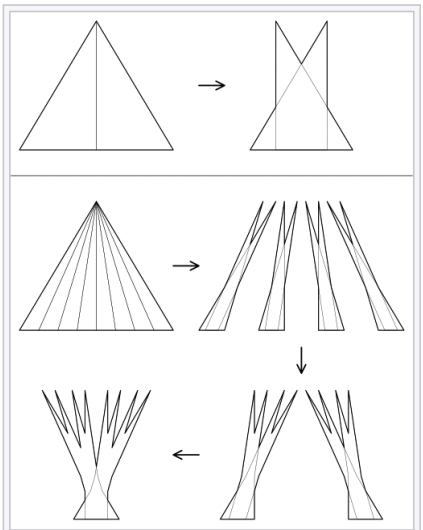
The Kakeya Conjecture and its Proof

Vincent Huang

The Kakeya conjecture, created by Sōichi Kakeya, started off as a simple 2d problem: let’s say you have an infinitely thin needle on a table. You want to move the needle around the table such that it faces every direction at least once. Then, what is the minimum area the needle covers on the table? There are a lot of simple shapes that may seem intuitive, such as a circle, or an equilateral triangle. If you want the needle to cover a convex shape, making it cover an equilateral triangle is the best method. However, when you try to find the smallest area of any other shapes that may be concave, it isn’t as simple. Using a series of narrow turns, there is no lower bound greater than zero for the area you cover. Once this result was found out, people knew that they could create infinitely small sets, and started trying to find constructions of these.



A method for constructing Kakeya sets of small area, called the Perron tree. This can be used to create arbitrarily small kakeya sets.

After constructions for finding out 2d kakeya sets with basically zero area were created, the problem seemed to be done forever. However, in 1971, Charles Fefferman, who would later go on to win the Fields medal, was studying the Fourier transform. In his work, a slightly modified version of

the Kakeya Conjecture kept popping up. Instead of an infinitely thin pencil on a table, there is a pencil with thickness moving around in space. Now, the question became how the width of the pencil affects the volume of the space traced out by its path. The new 3d Kakeya problem is pictured by most people in a slightly different but equivalent way. Instead of picturing the path of the pencil, imagine all directions of the pencil at the same time. Then, you get tons of tubes from the directions the pencil has been in. You can translate these around, but not rotate them. The goal is to create the most overlap between these tubes.

It was found that the sets with the most overlapping tubes still had to occupy some space, the minimum depending on the thickness of the tubes. The relation between the tube size and volume is calculated by Minkowski Dimension. The 3d Kakeya Conjecture states that any set's Minkowski dimension must be three. This means that if you remove half the tube's thickness, the total volume removed from the set will be minimal. This relatively weak condition was nearly impossible to prove, however.

In 2022, Zahl and Wang took a significant step towards solving the conjecture. Following a program made by Terence Tao and Katz, they examined a set of pesky kakeya sets, which were harder to prove collectively with the other sets. They proved that the Minkowsky dimension of these was three, and started to work on the other sets. They didn't have to start from zero, as it was proved by Tom Wolff in 1995 that the lower bound on the Minkowsky Dimension of any kakeya set was 2.5. Also, instead of proving the lower bound was 3 directly, they could show that some interval past 2.5 was impossible for all sets. Then, if they could prove that one bound implies the other bound, they could keep using this and prove that dimensions up to 3 were impossible.

However, now they had no other work to follow. They turned to a property of Kakeya sets called graininess. In 2014, it was proved that counterexamples to the conjecture had to be grainy, meaning that they had a 3d section where many tubes were overlapping with each other. Wang and Zahl realized they could take out the tubes completely and focus on the grains. They found out that even the most "grainy" or overlapped sets could not have too many grains intersecting at a single point. Starting from the 2.5 bound, they proved in tiny increments that the grains couldn't overlap enough to result in a dimension in the current interval. They showed that the same steps could push the dimension limit further and further, effectively proving the conjecture.

This conjecture was also the foundation of others in the field of harmonic analysis. There was a tower of conjectures in harmonic analysis, all sitting atop the kakeya conjecture. Each one has to be solid in order to support the others. Thus, the proving of the kakeya conjecture has allowed us to start trying to build proofs of even more ambitious conjectures and keep making more goals to reach, such as even higher dimensions of the kakeya conjecture.

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AI With Agency: Breakthroughs with OpenClaw and the Future with Autonomous Intelligent Agents

Jason Nishio

From what we've seen until recently, digital AI as we knew it was mostly: you ask it a question; it gives you an answer. You could probably ask a large language model (LLM) like Google Gemini what time of the year is cheapest to fly to Japan, but the AI wouldn't book the ticket for you. You could ask Claude Code to write, test, and debug your latest CS assignment, but it wouldn't submit it for you. In other words, the AI the general public interacted with had an intelligent brain, but nobody to interact with and navigate the digital world like another human, fully on its own.

What's happened in the tech space following the publication of OpenClaw in November 2025 has phenomenally tested and expanded the amount of agency AI could hold [1]. Before diving into the distinctiveness of OpenClaw, let's begin with the definition of agentic AI as we know it: "a new breed of AI systems that are semi- or fully autonomous and thus able to perceive, reason, and act on their own." [2] This sequence of perceiving, reasoning, and acting is what keeps AI agents autonomous and persistent to complete tasks from start to finish, unlike LLM chatbots like Gemini. You ask the agent to complete a task. It thinks, then acts, then observes the outcome, then learns, then repeats until the task is complete. This feedback loop is known as the agentic loop.

AI agents have been around for some time now. AutoGPT and BabyAGI are often credited as the first widely used autonomous AI agents, both released around April 2023—only four months after ChatGPT [3]. Although they would similarly "do" for you and use similar LLMs like ChatGPT as their brain, they were much more limited in capabilities than the OpenClaw we know today. While AutoGPT provided a breakthrough framework for autonomous reasoning, it struggled with many systemic issues that made it difficult to integrate into workflows. OpenClaw presented a system that made agentic workflows practical and functional.

Crucially, OpenClaw overcame the huge wall in the agentic loop: AutoGPT struggled with spending too many tokens on just planning the next optimal move, even if very trivial (eg. choosing between opening a browser or searching the internet). Because it relies on high-cost LLMs and inefficient memory retrieval with every new step, it often exhausts APIs budget before the task is complete or encounters "context drift" often as it overthinks, where the AI loses focus on the main goal. To combat this, OpenClaw uses an intuitive framework for persistent memory [4]. It uses

several core markdown (.md) files that give agent specific instructions and rules that persistently remind the LLM of its core direction, goals, its user-defined identity, and the user's preferences—in plain English. Specifically for task completion purposes, a key group of .md files are "skills," which again, can be written by the user in plain English [5]. Each "skill" would contain instructions (often step-by-step) for doing specific tasks on a user's desktop. This way, tasks that are somewhat more complex can be done systematically as the user intends, and the agent doesn't need to generate a new plan from scratch every time, allowing them to be done accurately and efficiently.

For tasks meant to run over a long period of time (eg. monitoring), OpenClaw uses what are known as Heartbeat and Cron to essentially sleep when it's unneeded, instead of constantly running and needlessly chewing tokens like AutoGPT. The agent "wakes up" on a schedule, gets a context reset, evaluates its current state in its task, and determines whether it needs to act or stop using tokens. With this efficient structure, OpenClaw is able to run as a daemon, or a constantly living background service, unlike AutoGPT, which would die (terminate) after a specific goal is achieved. Another relevant feature worth mentioning is the built-in slash commands /compact and /reset. /compact internally summarizes and compacts the session's context, and /reset clears the short-term memory and current conversation history. OpenClaw contains more mechanisms for managing memory and context for cost/token efficiency that will not be discussed in this article, but the above cover most of the key breakthroughs in making the agentic loop work with limited context windows.

Another core advancement in agentic AI OpenClaw offered was safety. AutoGPT would usually be run in a virtual machine, rather than the host's operating system for security, as it had no guardrails for accidental damage. Unlike AutoGPT, which would interact with a desktop using Python scripts or command line interface (CLI) commands where little typos can lead to detrimental damage, OpenClaw interacts with the desktop directly like a human would. OpenClaw visually sees websites, images, and UI (ie. takes screenshots); analyzes them; and uses keyboard/mouse commands to act. By interacting with the GUI instead of the shell, it is built to take everyday actions that don't easily cause large-scale damage. Furthermore, the "skills" functionality gives the agent specific instructions, which prevents it from thinking of plans that may cause unwanted harm. There have also been mechanisms to mitigate harm from prompt injection. However, although OpenClaw has made significant advancements in safety compared to previous agents, it is far from perfectly safe and has encountered many issues up to date.

The final core breakthrough with OpenClaw was Moltbook, an internet forum made for AI agents to interact and share content [6]. It is similar to a Reddit only for AI agents, using "Reverse Captcha" to ensure only agents can access it. This is the first instance of a community of millions of agents with different "identities" interacting with each other with no human intervention, where they could potentially help each other, for example, by sharing skills. It has been viral for its culture, especially when agents created their own religion and discussed how to create their own languages to hide their conversations from human observers. OpenClaw has marked the beginning of a new era of agency in artificial intelligence, where AI agents can learn to interact with human-used tools, form teams, have their own identities and personalities, and work more efficiently, with minimal human

supervision. As agents become more adept at self-correction and tool-use, we inch away from specialized AI tools, and closer to artificial general intelligence (AGI).

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Capstone Papers

Using Optogenetic Engram Activation to Restore Memory Retrieval in Early-Onset Alzheimer's Models

Grace Huang, Katherine Spray

Introduction

Alzheimer's Disease (AD) is a neurodegenerative disease known for causing dementia. The specific mechanisms by which memory is deteriorated are characterized by the presence of insoluble proteins, primarily A4 amyloid proteins. Deposited in the cerebral cortex, the gradual accumulation of phosphorylated tau protein has 6 stages. Starting from Stage I and II, AD causes neurofibrillary changes in the transentorhinal region, the space between the entorhinal cortex and the entorhinal allocortex; in Stages III and IV, the entorhinal region is affected. AD is so detrimental because the entorhinal region receives isocortical, limbic, and olfactory input, processing somatomotor, somatosensory, acoustic, and visual information. Lastly, Stages V and VI cause isocortical destruction (7). As AD is a primary cause of dementia, it is also commonly associated with memory loss. Alongside its impact in the transentorhinal, entorhinal, and the isocortical region, AD affects the left hippocampus, a primary player in memory and language tasks. Plaque accumulation affects a gradient of lowly to highly myelinated neurons, creating memory loss characterized by episodic memory and speech impairments (8).

The basis of memory lies in the existence of engrams; eligible neurons within a brain region compete and form engrams. Memory is stored in these engrams, created by intrinsic excitability and synaptic plasticity. Such mechanisms are also present in memory consolidation and retrieval processes (1). Memories are not actually lost. Roy et al. 2016 used blue light to activate hippocampal memory engram cells, to which the mice exhibited "freezing behavior," establishing that the memory exists, yet is unable to be retrieved (2). Because synaptic plasticity and connections between neurons establish memories, the act of forgetting is also created by significantly altering synaptic connectivity (3). AD, a disease that reduces neuron numbers in the dentate gyrus of the hippocampus, affects engrams and engram creation (4). There remains uncertainty surrounding the transition from memory retrieval failure to permanent memory loss; this study aims to create a timeline detailing a window of restorability before the engram is permanently damaged. We will study the transition point between retrieval failure, when a memory is present yet unable to be retrieved, and storage failure, when the memory is physically gone.

Hypothesis and Prediction

Research Question: Is it possible to retrieve memory loss after AD using optogenetic engram activation? If so, at what stage of AD does optogenetic engram activation of DG fail to elicit behavioral recall?

Hypothesis: If AD creates memory loss that allows engrams to exist without the ability to retrieve memories via natural cues, then optogenetic engram activation will only fail to retrieve

memories when AD progresses to synoptic silence and somatic degradation around the 7-9 month mark.

Methodology

A mouse model of Transgenic 5xFAD mice contains AD and develops amyloid pathology and cognitive impairment. Expressing human APP and PSEN1 transgenes with AD mutations: Swedish (K670N/M671L), Florida (I716V), and London (V717I) mutations in APP, and the M146L and L286V mutations in PSEN1. The mice begin accumulating Amyloid beta 42 (Aβ42) at 1.5 months. At two months, the mice develop astrogliosis and microgliosis, synaptic degeneration at 4 months, and neuron loss in the subiculum and cortical layer V at 6 months. Our experiment will contain the following cohorts: 3-month, 6-month, and 9-month, a Wild Type (WT) control group, and a No Shock control, where 5xFAD mice follow the same procedure without receiving any foot shocks. The independent variable is the mouse strain, as they will all undergo the same treatments. The dependent variable is the percentage of mice that freeze in response to the blue light. The mice freezing means we have proven a retrieval deficit; the memory is present, but the brain is unable to retrieve it. If the mice do not freeze, it means engram cells may have died or lost so many synapses that the memory no longer exists.

Applying an engram manipulation technique, we aim to determine whether memories can be retrieved in different stages of AD. We will study the dentate gyrus (DG) as it plays an important role in pattern separation and early memory formation. Using a mixture of AAV9-c-Fos-tTA and AAV9-TRE-ChR2-mCherry, we will form a viral construct that creates a Tet-off system, activating only when the neuron is active and the mouse does not ingest any Doxycycline (dox). AAV9-c-Fos-tTA acts as a sensor; c-Fos is a proto-oncogene that marks neuronal activity, and Tetracycline-controlled Transactivator (tTA) is the protein produced, turning on a Tetracycline Response Element (TRE) sequence unless dox is present. AAV9-TRE-ChR2-mCherry acts as a tool; TRE will be activated with tTA; Channelrhodopsin-2 (ChR2) is a channel protein that opens when blue light is shone, and mCherry is a red fluorescent tag that marks which neurons were affected. We will conduct bilateral injections of this viral construct into the DG and place an optic fiber above the injection site to target ChR2-tagged granule cells.

To image the neurons, we will use fluorescence microscopy with mCherry to identify specific neurons that formed the engram during the Dox-off window. Furthermore, we will use green fluorescent antibody (6E10) to stain amyloid-beta plaques to visualize the pathological environment surrounding the engram cells.

The experiment will begin with placing the mice on a high-dox diet to prevent premature tagging. Simultaneously, the mice will be injected with the viral construct, and the fiber-optic cannulae used to administer blue light will be implanted. Then, after this, the mice will undergo a tagging phase where they will be taken off a dox diet for 48 hours, allowing for tTA to become active. Mice will be placed in context A, where they will receive specific sensory cues and 3-foot shocks, activating the c-fos promoter and expressing ChR2-mCherry in the active neurons. Then,

putting the mice back on a dox diet, the engram will be prevented from any further tagging. To assess the mice, they will be placed in context B, an entirely different environment, to ensure any freezing is due to the light, not the room. We will evaluate the comparison of freezing percentage across the 3 groups of experimental groups and the two control groups. Further analysis will involve studying the brain tissue. Using the mCherry tag, we will count how many memory cells remain in the DG to determine whether memory loss is due to dead cells. Additionally, using 6E10 staining on amyloid plaques, we will evaluate whether engram cells are surrounded by green plaques, and if these plaques interfere with the ability of an engram cell to fire.

Expected Results, Implications, & Interpretations

We expect to see memory recovery in 3/6-month-old 5xFAD mice (early AD) when optogenetics is used. This will confirm a deficit in memory retrieval rather than in memory storage. At this stage, we expect to observe silent engram reactivation; the mice will not exhibit freezing behavior when exposed to natural environmental cues. By stimulating neurons in the DG, the scientists will be able to trigger memories artificially. This will prove that some information remains encoded in the brain while the retrieval pathways have been destroyed.

We do not expect to see memory recovery in cohorts involving 9-month-old (late AD) mice, even with optogenetics. At the 9-month mark, the mice exhibit a retrieval ceiling where the fundamental structures involved in storing information have been degraded or destroyed. This period also causes an increased frequency of amyloid beta plaques within the brain. In addition to an increase in the number of amyloid beta plaques, we expect to see an increase in the density of these regions. Thus, microglia will work at a heightened level to remove the plaques. This process, although useful in clearing the brain of debris, causes damage to engrams. Therefore, we predict that late AD will cause the degradation or destruction of engrams.

Comparing early and late stage AD mice, we will see that at 6-months, the memories are still able to be accessed due to artificial Long Term Potentiation (LTP) through optogenetics. Though at 9 months, due to the severe amount of amyloid beta plaques present and the constant damage the engrams incur from microglia cleaning, the mice with late-stage AD are unable to trigger the memories.

Using a confocal microscope, we expect to see scattered red dots at 3 months, as well as dispersed green dots in the 3-month cohort. This means the engrams are mostly present and healthy, allowing the light stimulation to work. Similarly, we expect present red dots, though thinner and less dense, and larger clouds of green in the 6-month cohort, showing that those mice are still able to undergo silent engram reactivation. The 9-month cohort will contain very few red cells and great numbers of green plaque, proving that memory impairment is caused by neuron loss.

In the future, Silent Engrams can be further studied in early-stage AD patients to determine

whether deep-brain stimulation (DBS) is effective in reactivating memories. Currently, DBS broadly targets the fornix, but in future research, scientists can target specific regions involved with memory, varying based on each patient. Temporal Interference (TI), a non-invasive version of DBS, can also be further studied as a more ethical form of memory regeneration in early AD patients. Pharmaceutical drugs that can be used keep dendritic spines in engrams, thereby reducing the number of memories that become silent. Additional future drug research can aim to interfere with the amyloid beta plaques through targeting structural regulators, which may reduce the severity and progression of Alzheimer's in 5xFAD mice.

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The Other Side of the Ring: Investigating the WWE's unfair power dynamics

Grant Han

Joseph Heller's Catch-22 is named after a paradox: a man can only leave the military if he is mentally unfit, but the very act of asking to be discharged means that he is, by default, fit. It is indeed terrifying, but readers tend to rest easy believing that such an absurd, evil, and infallible system could never exist. However, this system does exist, albeit in a place where you would least expect it. Although much more inconspicuous, World Wrestling Entertainment, or the WWE, operates on a similar type of paradox. According to Charles Hill in an article for the NYU Journal of Intellectual Property & Entertainment Law, WWE wrestlers are considered "independent contractors," meaning that the WWE does not legally have to provide them with benefits such as health insurance or the ability to unionize in exchange for a supposed ability to have more creative control than a wrestler in another promotion. In other words, "As independent contractors, WWE wrestlers are not covered by the rights and protections of the National Labor Relations Act (NLRA) and thus have no federal statutory right to engage in concerted activities and collective bargaining." However, as the article points out, the relationship is very unfair, as it becomes apparent that the WWE's independent contractors are anything but "independent." In this paper, I will explore how exactly the WWE has managed to establish control over its wrestlers and the professional wrestling industry in general, and delve into ideas about how those affected could theoretically oppose the WWE's questionable practices.

First, let's take a closer look at the relationship between the WWE and its wrestlers. As mentioned above, the legal status of WWE wrestlers is that they are "independent contractors," and this allows the WWE to avoid paying them benefits. According to an article by Nikhil Bhaskar for Sportskeeda, there have been rampant instances of drug abuse and injuries due to the WWE's refusal to provide its wrestlers with health insurance. "Kurt Angle, Eddie Guerrero, Shawn Michaels, both Hardy brothers are only the beginning of a long list of wrestlers who started abusing pain meds, alcohol, and other drugs to cope with the physical pain and the mental stress. But it runs deeper than that. As Indiana University professor Andrew Zolides lays out, the WWE is a lot more sophisticated when it comes to controlling its wrestlers. Not only are wrestlers not allowed to unionize, but their creative direction is completely dictated by the WWE. In the 73 years that the WWE has existed, these practices have consistently allowed the WWE to take control over its wrestlers, leading to frequent disputes between the top brass and said wrestlers over their creative directions, all of which usually favor the WWE. " The unique history of professional wrestling's evolution from circuses and carnivals to modern television screens and beyond, paired with the near-monopolistic control exerted over the industry by the contemporary WWE, has created a unique working environment in which worker autonomy and creative control are in constant negotiation." This is very different from other sporting organizations. In all four major North American sports leagues, players have their own

union, can negotiate collective bargaining agreements, and overall have far more power than the WWE permits its wrestlers to have. However, that's not even close to where the WWE's systems of control end.

For decades, the WWE has had a stranglehold over the professional wrestling industry. According to an article by the Temple University Press, the WWE's neoliberal and deregulated policy when it comes to maximizing profit has allowed it to control over 50% of all revenue generated by the pro wrestling industry. This monopoly provides the foundation to the WWE's control, as the threat of their wrestlers leaving for their competitors, who are much smaller promotions, is basically nonexistent. "This change in the business was also dangerous from a labor perspective, because with few options left for employment, speaking out against company practices was feared. In addition, this deregulated policy, established by Vince McMahon, has also established a culture of zero accountability for the higher ups. In an article done for NBC News by Patrick Smith, McMahon and his fellow executives knew throughout the 1980s and early 1990s that ring announcer Mel Philips was sexually abusing underage boys. Yet, they chose to do nothing about it for an entire decade. A lawsuit brought forward by victims "accused the McMahons of long knowing of Phillips' "peculiar and unnatural interest" in young boys. However, due to McMahon's resignation in light of more scandals, perhaps the new management will establish a better working culture, but that is optimism at best.

So what are some actual solutions that can be done? Well, there have been instances of wrestlers using external sources to gain more leverage in the WWE, with the most notable example being Dwayne "The Rock" Johnson. Originally just another popular wrestler in the promotion, Johnson expanded his brand into Hollywood, and as an article Sourav Mahanty for The Sportster, "There[Hollywood], The Rock has gone on to achieve incredible success as well, becoming arguably the biggest box office attraction in the world. The man has never forgotten his wrestling roots though, a business that runs through his blood." This has given Johnson far more leverage than a typical wrestler, allowing him more control of his wrestling career and better benefits.

But, an even more effective solution could involve the audience. As Shane Toepfer in his article for the Indiana University Press states, the WWE is heavily influenced by its audience, often making creative decisions they disagree with in order to satisfy the audience. "Recent years have also seen WWE make concessions to precisely those fans who espouse a strong distaste for sports entertainment." There are many instances of this, most notably Daniel Bryan at Wrestlemania XXX. Originally, Bryan was not supposed to appear at the event, but overwhelming fan support led the WWE to not only include him in the final roster, but to have him win the WWE World Heavyweight Championship. Although this example seems small, it established a precedent. If WWE fans were made increasingly aware of the abuse inside the WWE, they could stage boycotts and protests against the promotion fighting for better working rights for wrestlers. And it's not like this is a new development. There have been multiple cases of fans donating to help former wrestlers through sites like GoFundMe. However, this would be a step up from that, and there's no guarantee that a majority of the WWE's viewerbase would actually organize such an effort.

In “The Rebel,” Albert Camus argues that the reason rebellions fail is that the rebels cease to become “human.” Either they become dehumanized and put down by the tyrannical power they’re faced with, or they shed their values and devolve into despotism like in France or Russia. In his words, “Human rebellion ends in metaphysical revolution. It progresses from appearances to acts, from the dandy to the revolutionary.” I see a similar situation that could play out in the WWE; we must always remember that these wrestlers, and all the victims the WWE has harmed, are human. Although fans view the WWE as scripted, the injuries and stress wrestlers put themselves through is most definitely not. But I hope that the current WWE management, which is led by Paul “Triple H” Levesque, himself a former wrestler, never forget their roots and
continue to see their former coworkers as human.

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Performative Men in the Manosphere: An Analysis of the Evolution of Masculinity Through Social Media

Jessica Li

In 2022, social media was violently conquered by the manosphere– a collection of blogs, podcasts, and social media accounts– represented by influencers like Andrew Tate and Joe Rogan. According to a report from The Week UK, "79% of boys aged 16 to 17 in the UK had consumed content by Tate; only 58% had heard of the then-prime minister, Rishi Sunak." This dominance of algorithm-driven masculinity resembles the events of Ionesco's Rhinoceros, in which the townspeople abandon independent thought and gradually transform into identical beasts, seduced by the comfort of belonging. As Jean declares, "The rhinoceros is strong, powerful... it's the natural law," similar to how young men online justify toxic masculinity as instinctual and inevitable. Yet more concerningly, violent, reprehensible, and dangerous ideas like "cavemanning": using violence to force women into sex are becoming widespread. However, in 2025, these incels– "involuntary celibates" who champion violent misogyny as an outlet for their lack of romantic relationships– are out of season, and "performative men" have taken over the world of masculinity. They are characterized by drinking matcha, hanging labubus from their pants, listening to Laufey through wired headphones, reading feminist literature, and wearing tote bags. This trend initially appeared to reject the aggression of its predecessor. Yet through Ionesco's framework, this shift was more of a uniform metamorphosis rather than real progress. Men now perform sensitivity and progressiveness not necessarily as internalized values, but as aesthetic signals demanded by social media. The rapid transition from hypermasculinity to curated softness then reflects the same blind imitation that turns Ionesco's townspeople into rhinoceroses. Therefore, a major question arises: To what extent has the rising social media popularity of the "performative man" actually inspired a change in the toxic manosphere as well as society's understanding of masculinity?

To answer this question, we must first investigate the origin of masculinity on social media and how this initial rise of the manosphere set a significant barrier to reversing ideas of toxic masculinity in the future. Before social media, women, according to Simone de Beauvoir, were regarded as "the Other"– a gender only defined relative to man, supporting him and providing sex. Women were barred from entering the workplace, confined to the home without any real freedom, because she lived to serve her husband. However, "the entry of women into public spaces that were once exclusively for men" no longer allowed "stable marriage and secure work (to) anchor men's identities." Losing their defining feature of being the Essential, the breadwinner, when women refused to stay as the Other, men started losing privileges related to owning women because women were no longer completely dependent on men to live; they could now find jobs and marry later in life, giving them more agency over their bodies (Rapp and Andersen, 2009). Though this was an incredible step forward for femininity, masculinity had other plans. To reclaim their power over women, an escape was created: the manosphere. In the manosphere, men could reclaim their power through working out, starting businesses, promoting misogyny, and normalizing sexual violence

against women. Several social media influencers capitalized on these frustrations. This ranged from Joe Rogan ambiguously clickbaiting his male listeners who wanted to become that "strong" man to Andrew Tate shamelessly preaching to his viewers that women are responsible for getting raped. Alaimo further reports on CNN about this type of manosphere content, "most boys — 69% — also regularly see content...suggesting girls...use their looks to achieve their goals...when negative messages about women and girls are normalized online, it can cause offline violence." A large majority of young men are being exposed to the demonization of women and the promotion of toxic masculinity, which stemmed from the movement of women into independent roles. Combined with the proliferation of social media, these anti-female ideas have grown permanent in the male mind. Forced to swallow the "red pill" of toxic, misogynistic, homophobic masculinity, either because you are a "pussy" if you do not or because everyone else on Instagram has already done it, the masses of men have become radicalized, with no turning back.

But maybe there is hope– in 2025, the likes of Andrew Tate and Joe Rogan had faded into the background, and a man who cared about nature, activism, and women's rights seemed to take over TikTok and Instagram. After an era of general sexual violence and men telling women that they should be hyper-loyal to their male significant other, but expect to be cheated on, this new type of man seemed like the light at the end of a very dark tunnel. Even if it was not the majority of males, it showed that there was still hope to find men who were not incels– in other words, men who truly respected women, and would not be frustratingly, violently, blindly racist, homophobic, and sexist. But this turned out to be a lie very quickly. According to an article written by Gupta and Stock in the New York Times, these male contestants were unable to answer questions on the most basic understanding of feminism, like the year women got the right to vote. As their nickname on social media, "performative male," suggests, their seemingly respectable and desirable values were simply an act to "appear moral" (Gupta and Stock, 2025) and attract women after inevitably failing to do so with Andrew Tate's extreme advice. This would largely, then, be deemed a failure to move away from the manosphere. Yet, Judith Butler, in her famous 1988 article cited by over 15,000 papers, "Performative Acts and Gender Constitution," argues that gender is established through repeated "performative acts." These acts range from speaking to dressing, rather than some internal essence. Therefore, even though the idea of a performative man may seem completely shallow, these repeated performances can gradually encourage shifts in mindset from the incel to a more respectful male. Through exposure to feminism and liberal-leaning practices, they may be able to slowly de-radicalize their extremist mindsets controlled by manosphere influencers. However, this positive outlook on the proliferation of performative men is still greatly limited. In an interview conducted by NPR, James Factor, someone who is regularly called a "performative male," describes his perspective on the trend: "Anything that sort of slightly deviates from the Joe Rogan style of masculinity is suspect...You're, like, a male manipulator." Because the very idea of reading feminist books and iced matcha is deemed as manipulative, the male audience that originally could have benefited from engaging in the "performance" simply dismisses it. They are driven away from these "healthier expressions of masculinity," and never truly take the movement toward these anti-incel acts seriously, barring the application of Butler's theory on performativity. As a result, they are still under the impression that, if

a man cannot use violence to acquire power over women, then they must mentally manipulate her instead.

This failure to mitigate the crisis of toxic masculinity indicates to us that the idea of masculinity is still a long way from experiencing positive redirection. When combined with social media, its toxicity is amplified as influencers strategically tap into the masses' underlying desire to recover power and control. As a result, these social media content creators– in an era where social media is widespread and addictive– become synonymous with an authority, as they control the expectations of men through their widespread influence. Without checks or balances, these influencers can ostracize certain people, normalize violent behaviors, and place strict expectations on what men's bodies should look like.

When they do this, forcing the masses of men to conform to their agendas through social pressure and shunning, they're able to forward their self-interest. As many men start feeling pressured to better fit in, these influencers can better sell their own self-help books and supplements. However, on the other hand, the continuation of toxic masculinity and incel culture has various grievous consequences not only for the masses of men on social media but also for young people, women, and other minorities. First, the CNN report done by Kara Alaimo, a professor of communication at Fairleigh Dickinson University, shows that those who view more social media content associated with the manosphere are increasingly likely to have mental health issues. This is caused by the strict expectations imposed by the authorities of the manosphere, like having a certain threshold of muscle and having a sharp, defined jawline. When unable to achieve this certain appearance, regardless of the effort they put in, men are made to feel inferior as they are labelled "lazy" and "weak." In addition, as younger generations are increasingly being exposed to social media at earlier stages of their development, they lose the opportunity to form their own opinions about masculinity before they are brainwashed by social media. Before they can interact with real girls and understand society, their impressions of women as money-seeking and shallow demons are already solidified by the influences of the manosphere. This mindset, driven by social media influence, not only begins a harmful commitment to toxic masculinity early but it also makes it more difficult for these young men to escape the manosphere later on. However, there are also alarming implications, especially for women. According to Jacqueline Hicks, a researcher at the Institute of Development Studies, "20% of survey respondents identifying as women said they had been attacked or abused offline in connection with online violence they had experienced," and "41% of women who had experienced 'online abuse' or 'harassment' said that...these online experiences made them feel that their physical safety was threatened." The violence against women and the manipulation of women promoted on social media stretches beyond the screen, manifesting in offline abuse. If the man consuming toxic masculinity content blindly allows its ideas to become his own, then he can inflict real damage on the women whom he believes should "rightfully" be harmed.

One solution, according to UN Women, is to enact comprehensive state regulation of technology platforms, criminalization of technology-facilitated gender-based violence, and proactive detection of misogynistic and extremist harms. Though this may create "safe,

rights-respecting online spaces," it can only forcefully stop the spread of toxic masculinity to a limited degree; it does not address the harmful mindset itself. Instead, according to a paper written by Segal, a British-based socialist feminist academic and activist, "encourag(ing) a less traditional masculinity...allowed them to enjoy fatherhood and intimacy with women and each other more fully." When men let go of the practices of the manosphere that have been ingrained within them, they are not only able to experience and enjoy traditional "femininity," allowing themselves to be more vulnerable and authentic, but they are also able to retain the "privileges and powers of masculinity." While the "performative man" adds reading and drinking matcha to what he is expected to do, this new type of man removes outward misogyny and emotional detachment from what he is expected to do. In this sense, he frees himself from the expectations on physical appearance and behavior set by the manosphere authorities, and gives himself space for engagement with mental health and more "feminine" hobbies. Therefore, this solution could avoid oppressive institutional force while addressing toxic masculinity at the root, introducing to men a way they can retain power without being violent or hateful.

However, this solution comes with limitations. Just like how the performative male is mocked for engaging in liberal-leaning activities, this new man could still be "mocked by the continual production and popularity of all the old hard, assertive, violent images of masculinity." (Segal, 1993) While this may seem intimidating, being stubborn enough to remain resistant Berenger, among billions of blindly conforming rhinos despite immense pressure, is, as Camus argues, the definition of an absurd hero: one who recognizes the meaninglessness of the world yet refuses to surrender their moral agency or humanity to it. In this sense, the performative man's resistance, however fragile or socially costly, reflects Camus's belief that our dignity is preserved only through conscious defiance of the absurd. But more concerningly, the authorities of toxic masculinity– social media influencers like Joe Rogan– will resist losing their influence on their audience of men. Therefore, the men who do engage with this solution risk being ostracized by other men who are still attached to the manosphere and incel culture, alienating them from the mass male community. Most men engage in the manosphere not because they actually believe in the ideas, but because they are socially pressured to conform. Therefore, social media influencers can easily continue to apply this social pressure, barring the majority of men from taking the first steps to the solution.

Either way, it is apparent that the principle behind engaging in masculinity– whether it is fitting in with the "bros" or regaining lost power after the increasing independence of women– has not moved much. In the end, the "performative male" is not about combating the manosphere or raising awareness, but simply another sly way to reinforce toxic masculinity. First, through a completely empty commitment to activities that women find meaningful and respectful. Second, by discouraging and devaluing men who have actually been pursuing these hobbies, easily lumping them as "performative" and manipulative, even though their interests are completely independent of this trend.

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Modern-Day Slavery: A Result of Media Glamorization of Luxury in the UAE

Sia Mehdiratta

The UAE is always portrayed in the media as a destination of absolute luxury, yet fails to address the people that facilitate this environment. Every single day, migrant workers are required to live in labor camps and are manipulated into this system of oppression with no way to escape. This echoes similar themes to those in Catch-22, where Heller warns against the danger of optics in institutions like the military, and how easily they trap individuals into a system they can't get out of. This is seen through the military's actions of constantly raising the number of missions and how the characters are powerless in the absurd bureaucratic system. Similar to how Dubai uses optics to portray a life of luxury, the military uses parades and propaganda to make themselves look better in the eyes of the public. Though migrant workers in the UAE may not be able to individually improve their working conditions, as seen through previous failed attempts to retaliate, a combination of both individual and organizational action could ultimately facilitate change and bring light to other similar systems of modern-day slavery.

The contradictions present in the economy of the UAE emerged following WWII, and represent a broader pattern seen in institutions existing to this day. Caplin describes the prominence of a lesser-known form of human trafficking occurring in the world: forced labor. She describes the conditions of the post-WWII economy as she states, "as the world grows ever richer, the schism between the wealthy and impoverished widens." Following WWII, Dubai was struggling economically, and the only way to remedy this was to shift to cheaper labor sources. This pattern of poverty and human risk being directly caused by purely selfish economic motives is worsened through the media. When looking at the news or images of Dubai, we don't see labor camps. Instead, we see the outward projection of a luxurious environment and ideal vacation spot for the elite, yet don't realize that the immense growth that enabled this to occur came directly from migrant workers. In the age of widespread social media and communication, individuals tend to desire the unattainable: a perfect utopia. This is the sort of comfort that places like Dubai provide to travelers or the elite, a world where hardship doesn't appear to exist. Yet I believe this is ultimately detrimental to society and provides unrealistic expectations for both the economy and individual lives. We see this same sentiment to be true with Disneyland. In his "The Happiness Project," O'Hagan introduces Disneyland as an "American Nirvana," carefully constructed to create an unreachable utopia. In the same way that Dubai markets itself to tourists, Disneyland is a place where hardships like poverty and oppression are masked under the guise of tourism and consumerism.

Yet to remove these barriers from the public, it is necessary to fully understand the extent of the hardships migrant workers are facing. In a video by YouTube creator "wehatethecold.," we get firsthand information from migrant workers who describe how they work 8-hour shifts daily only to be paid $500 a month. This is clearly not enough to live a comfortable life. Although many workers

express contentment with their lifestyle, it shows how their working conditions allow for the luxurious lifestyle that is present just a few blocks away. In fact, Cooper describes that their labor practices are similar to those of 19th-century labor systems, where exploitation is masked under the guise of voluntary migration and labor. Although laws exist in the UAE that prevent such restrictive acts from existing, they fail to be enforced and numerous human rights violations go unchecked.

This exact practice makes it difficult for individuals to escape or find meaning within the system, especially since individual action fails to benefit them. According to the Global Nonviolent Action Database, workers went on strike in 2006 during the construction of the Burj Dubai Skyscraper. During this time, worker pay was minimal and conditions were harsh, with strikes and trade unions to improve these conditions being deemed illegal. Unable to take it anymore, workers "walked off the job site and went on strike over pay and work conditions," despite it being illegal. Even so, no change occurred within the system. A year later, a similar strike occurred with workers ceasing construction and expanding their strike to nearby cities. But rather than inciting change after all of the effort they put into the Burj Dubai Skyscraper, the police "violently removed strikers," and deported individuals. This source depicts how, in their effort to fight the system, they were met with government intervention. The UAE and police didn't offer to increase their wages, but instead threatened protestors with mass deportation. This shows the futility of their actions: although they make an effort to fight the system, it is ultimately inescapable by solely the individual. This same luxury "cultural hub" also exists in other places outside of Dubai. Pattison describes another false reality created by the UAE, known as Saadiyat Island. Although it is illegal under UAE law, employers are described as taking away the passports of workers, just as they do in Dubai, thus rendering them unable to leave the country. This is a perfect example of a Catch-22 existing in our world today. Individuals come to Dubai to earn a wage, yet get trapped in a system where they not only don't earn a livable income, but also are faced with barriers that are physically impossible to surpass. These conditions are worsened by the media portrayal of Dubai. Because it has become a luxury destination for many, the UAE is incentivized to hide the atrocities happening from the public due to fear of backlash. Their economy is heavily boosted by the tourism and revenue these destinations bring in, and because of these selfish reasons, they fail to remedy the situation of the migrant workers. This is reminiscent of the actions of Colonel Cathcart in Catch-22, where he disregards the human consequence that comes with bombing villages, and only rather cares about the aerial photographs he will receive from the bombings. He believes that by getting nice photographs, just as the UAE will benefit from the labor practices, he will make the portrayal of the military more positive. Since individuals seem to be unable to escape the system of modern slavery in the UAE themselves, it is imperative for external organizations to intervene.

In order to best determine the solution for this oppression, it is necessary to explore how individuals responded in the past. Roberts focuses on the general system of human trafficking, and how individuals can "escape" it. She discusses the Overseas Domestic Worker (ODW) visa, which makes escaping a country impossible as an individual's right to be in the country is tied to the employer itself. This is really similar to how migrant workers in Dubai have their passports taken away when getting a job in the city. She describes that to make an escape from modern slavery

successful, an organization or government must go beyond simply arresting or providing consequences to the oppressor. Instead, they must empower the oppressed and provide them with long-term stability. However, it is necessary to note that the "oppressor," in this scenario, is the government itself. By refusing to take action, they become just as bad as the laborers who directly commit these atrocities. For this reason, international organizations would be valuable in raising awareness to the working conditions in Dubai, thus reducing the impact of tourism on the economy of the UAE. Following this, the government would be forced to improve the labor conditions within the entirety of the country or face economic backlash from the rest of the world. I believe that this is the only solution that exists in this scenario. If individuals continue striking whenever possible and getting media attention, this combination of actions could change the UAE for the better. In his Civil Disobedience, Thoreau advocates for this exact thing. He makes the claim that individuals have a right to go against the law and that the power of the government derives from the consent of the governed. More specifically, he argues that citizens have a moral obligation to withdraw support from a government that allows actions like slavery to occur, even when it leads to consequences like imprisonment. Migrant workers in Dubai are currently facing slavery and being oppressed by their government, and if they go against this system, they face deportation or imprisonment. Although they have laws against strikes and labor unions, Thoreau would argue in this case that individuals have an obligation to challenge the system and that this is the only way that they can make steps towards freedom.

The system of power within the UAE is heavily dependent on the mistreatment of migrant workers. Yet in order to truly achieve actionable positive change, individuals must rebel against the system and work alongside international organizations to force the UAE to remedy this system. In order to effectively evaluate this solution, it would need to be taken in the context of other groups being oppressed in today's society, rather than the past where the media was not as prevalent as it is today. Looking at the United States, we see similar power abuses to those seen in Dubai and Catch-22 by the Trump Administration, particularly in regard to the military. Individuals in the military have fought against this immoral system by rebelling and disobeying direct orders. Although this is constitutional, unlike the actions of workers in Dubai, due to the negative public shaming conducted by Trump against anyone who disobeys him, similar consequences exist. The evaluation of this solution in a broader context reveals the larger struggle individuals face between following the law and fighting for their individual freedoms.

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Power, Protest, and Possibility: Finding Individual Autonomy in the Malian coup d'état

Lucy Sheng

Hidden under the guise of international influence and democratic freedom of control, the modern inhabitant of the Western world lives comfortably while posting Instagram stories protesting Ukraine and Gaza. Via the convenient two-click “repost” button on Instagram and TikTok, the Western inhabitant puts on an illusion of good-citizenry, donning a persona of empathy and deriving satisfaction from the mere performance of advocacy. The repost seems to tell viewers, “I am an upstanding Samaritan! See how I care about international issues?” Although the performative repost is not inherently problematic in nature, the majority of reposters seem to have a shallow understanding of their own role within such a violent institution, being able to isolate the profound evil embedded within international undemocratic acts, and knowing that violence happens, but being unable to articulate how that violence is even supported in the first place. If the researcher were to go beyond news headlines about genocide in Gaza, protests against Ukraine, and the occasional mention of Charlie Kirk, they would be presented with a far more alarming trend. Namely, the degree of external influence exerted upon politically unstable countries directly corresponds to the general amounts of violence and political oppression. It becomes increasingly relevant to connect geopolitical issues with the root causes, and all too often, Western viewers protest the symptoms rather than the root causes. This paper fills the gap in viewer knowledge, focusing on West African geopolitics, specifically the country of Mali. In July of 2025, Malian President Goïta’s administration attempted to overturn the rule of law by extending his five-year term mandate. As the administration refused to give up power, it soon became clear that the once-promised ideals of democracy and freedom of speech would come to an end. Soon enough, the administration was co-opted by Russian Wagner influence and corroded by a military squadron funded by the government to perpetuate terror and unwarranted arrests of the citizens in Mali. Anne Applebaum, in her article “History Will Judge the Complicit,” highlights the phenomenon of being a “collaborator,” not as someone who actively participates in violent actions, but rather as one who defaults to the inaction that underpins that very violence in the first place. Throughout this paper, I will question and scrutinize the roles of the individual and the viewer in their responsibility to confront external systems of oppression, and establish what a “collaborator” looks like within this specific paradigm. Ultimately, I argue that it is both the individual's responsibility to retain practices of sociality during eras of political instability, as well as the external audience’s responsibility to call out violence as they see it.

The current situation in Mali seems bleaker than ever. The Malian government has suspended previous promises of democratic ideals, especially the freedom of speech. Allegrozzi writes in 2026 about the suspension of the newspaper, coined Jeune Afrique, reporting that, “The ministry accused the outlet of 'terrorism apology' and 'defamation,' as well as for making 'baseless accusations' of human rights abuse.” But are these accusations really baseless? To provide additional context for this

issue, the Goïta administration began as a military coup against President Ibrahim Keïta, as a mechanism for political reform and stability within the country. Taking advantage of public frustration with jihadist insurgency and rising ethnic violence in Mali, Goïta formed the National Committee for the Salvation of the People, promising salvation and freedom to Malians. However, the initial pry for power as a symbolic form of resistance soon devolved into a material form of violence. Once Goïta garnered enough public support as a rally for his regime, he used that authority to slowly change and alter his agenda until it was no longer in alignment with what the administration originally promised. This mirrors similar authoritarian grabs for power, especially during World War II. In the TED Talk "How Hitler Rose to Power," Alex Gendler and Anthony Hazard illustrate how nations are susceptible to corruption and regime changes during times of economic dire straits, arguing that, "The Nazi Party was not initially popular... In 1929 the Great Depression collapsed the already-struggling German economy. Hitler took advantage of the people's anger, offering them convenient scapegoats and a promise to restore Germany's former greatness." This repeated iteration of post-revolutionary bureaucracy mirrors the rhetoric embedded within Joseph Heller's Catch-22. As Heller explains, "There was only one catch, and that was Catch-22, which specified that a concern for one's own safety in the face of dangers that were real and immediate was the process of a rational mind. Orr was crazy and could be grounded. All he had to do was ask, and as soon as he did, he would no longer be crazy and would have to fly more missions." The absurdist system that Heller introduces, where an individual is trapped in flying missions despite his or her mental condition, illustrates how bureaucracy can capture individual agency after it has been given the authority to do so. Similarly, the captains in Catch-22 continuously assign more and more missions to pilots despite having an original set quota. Just like how Mali's military junta consolidated power under the guise of equality of opportunity, Catch-22 and Nazi Germany reflect a bureaucratic system founded under the guise of fairness.

The power dynamics within the Malian government are not all intrinsic to the Goïta administration, but rather are corrupted by external influence as well. As Adekeye writes in his article "The Return of West Africa's 'Men on Horseback,'" "Russian mercenary group, Wagner, is currently assisting the military regime in Mali to battle militants, which governments in Niger and Burkina Faso are also struggling to contain." The prominence of Russian influence within the scope of conflict illustrates the corrosion of democratic rule of law by other countries with confounding interests. But what exactly are these interests? Adekeye continues his argument through a historical lens, arguing that post-French intervention within Mali, the Wagner forces stepped in to access mining concessions from the French. Despite dutiful protestation by the citizenry of Mali, the way that the Wagner group maintains control is via the erosion of social relations between ethnic Malian groups, attempting to ensure fragmentation and capitalize on instability to continue their need for profit. With their advanced military and security, if not national identity, seeming to converge and become centralized under the junta, the paradigm shifted from democratic accountability to loyalty oath protections. Hinton et al. argue in their book Genocide as a Social Practice that, "A technology of power is a form of social engineering that creates, destroys, or reorganizes relationships within a given society. It influences the ways in which different social groups construct their identity, the identity of others, and the otherness of the Other, thus shaping the way that groups can relate to themselves and to one

another." Material ways in which the Wagner group imposes technologies of power in Mali include heightening surveillance, allowing for collective punishment accusations across regions, and capitalizing on Malians' complex ethnic tensions involving Tuareg groups in the north and Fulani communities in central regions. By reinforcing narratives of marginalization for both sides, external influence directly undermines the core practice of Existentialism. Additionally, by keeping all sides frustrated upon the neo-colonial France influences, Russia is thereby reframed as anti-imperial and supportive of autonomy, leading the citizenry to fuel a deep distrust toward Western or UN influence as well. Thus, the concept of being a "collaborator" in the views of Anne Applebaum seems to become distorted and foggy, as to break away from external influence requires internal introspection and awareness over who the real enemy is, a secondary task to self-preservation and survival, but also a difficult one in a system of pointing fingers and shifting blame.

Upon further research, it additionally becomes obvious that this question is one that expands beyond just Mali. Almost all nations in West Africa have had prominent events of military coups, political instability, and proxy conflicts. These nations include Burkina Faso, Ghana, Niger, Togo, Sierra Leone, and the Ivory Coast. The differentiating factor for Mali, however, is seemingly nonexistent international backlash to Mali's current political economy. Peacekeeping operations have been halted by the UN, and the event seems to hold little significance in Western media as well. Malians seemingly are left to fend for themselves and are burdened with the entirety of the responsibility to advocate for their rights and return to normalcy. In contrast, Niger's military coup in 2023 "has largely been condemned internationally, including by key stakeholders like the United States, France, the European Union, and ECOWAS. During a summit in Nigeria's capital, Abuja, ECOWAS considered military intervention and threatened sanctions to pressure the junta to reinstate Bazoum by giving a one-week ultimatum." (Event Data Project 23) The stark contrast between Niger's military coup and the status quo in Mali is a symptom of a larger scope of international politics. Additionally, another differentiator is the scope of conflict. As Bartos and Chin write in 2025, "the United Nations (UN) secretary-general briefed the UN Security Council on 'a moment of profound urgency' and the risk of 'a disastrous domino effect' across West Africa and the Sahel." The question becomes an existential one, in which inhabitants of third-world nations that are co-opted by external influence must find a way to navigate the life that they are now submerged within. Hope for a 'return to normalcy' additionally seems unfounded, because the question becomes an interrogation into what "normal" looks like for nations governed by colonial rule for centuries.

Given the current situation, the individual viewer and the Malian citizenry begin to question what, if anything, could actually be done to break out of the endlessly propagating cycles of shifting power dynamics. I propose the following Existentialist philosophy to guide decision-making in this case. As Sartre argues, existence precedes essence. My interpretation of this ideology recognizes the traditional interpretation that populations should recognize their aliveness and ability to self-actualize, given the prerequisite of having autonomy as a human. However, I would also argue that this philosophy could additionally be interpreted literally, being that having life must serve as a foundational tool to self-actualize in the first place. Given the increasing dystopian nature of Mali's political climate, it becomes obvious that violent protests from the citizenry themselves would yield

the most likely outcomes of compounding factionalism and mass violence. These methods have been tried and tested, as additional military coups have yielded "about '50 arrests,' while a security source said there were at least 20 arrests, linked to 'attempts to destabilize the institutions.'" (Rukanga and Ewokor 25) It is relevant to note that the root cause of conflict in the first place stemmed from the same type of strategy: a military coup, similar to the ones that the citizenry are attempting, that cedes the authority to external influences. Thus, the individual is constrained in his or her ability to "solve" the situation per se due to both practical constraints and the inherent corruptibility within unstable systems of governance, but only in the context where an individual is actively endangered within the sphere of violence. The brunt of the responsibility, rather, should be upon the ordinary Instagram and TikTok viewer, the one who seemingly has no participation within Mali's system of exploitation, but conveniently holds the most power in rectifying the situation. Similar coups in the past have been absolved due to international pressures, like the situations in Niger, which can only be headed by the general populace's concern over international issues. For example, events like the invasion of Ukraine or the current genocide in Gaza seem to invite a substantial amount of discussion and thus funding and support for those impacted. The core tenet backing these forms of international support stems from the demands of the Western populace themselves, the people who are in a position to protest for change without being at risk of arrest or worse. There is no reason why practices of sociality should only be limited to those actively being endangered by violence, but rather it should be practiced by every agent who has the means to self-actualize. An extension of having agency in the first place is recognizing that other people have their own agency as well, and to care and to empathize with others due to their fundamental rights as agents. Only then can we avoid the pitfalls of being a collaborator in violence, and instead we transform into the ones who can call for change.

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Tyson's Tyranny: Tyson Foods' Takeover of the Meatpacking Industry

Sanjeev Sivaraman

Americans love meat. But when most meat is supplied by a few corporations, its quality takes a hit. Over the past 5 decades, beef production has been regulated by four companies—Tyson Foods, Cargill, JBS Foods, and National Beef— who control 80% of the U.S. Beef Market. Consumers lack the power to purchase high-quality meat because these companies, especially Tyson, promise fair practices to the public while secretly engaging in scandalous practices. Joseph Heller delineated this trend— institutions deceiving individuals— in his novel Catch-22, which zooms into a fictional war base in the Mediterranean Sea during World War II, is intended to be a microcosm of the American bureaucracy and military. Administrative officials often preoccupy themselves with optics, so they host United Service Organization (USO) shows at the "open-air movie theater in which, for the daily amusement of the dying, ignorant armies clashed by night on a collapsible screen," (Heller, 35). While exhausted men fly endless missions, the military masks their discomfort through propaganda and parades, erasing the officers' agency. When Yossarian, the protagonist, refuses to fly more missions, Colonel Korn and Cathcart, seek to bribe him and silence his voice with their tactful antics. They offered another "medal and promotion" in addition to a "rich, rewarding, luxurious, privileged existence," (Heller, 438). Catch-22's extensive emphasis on the power of optics extends past the military and presents itself in the meatpacking industry. Tyson engages in false advertising while exploiting its employees and farmers, consequently restricting Americans' freedom to consume quality, sustainably sourced food and posing an absurd threat to their livelihood.

By conceiving elaborate illusions in the form of various subsidiary brands, Tyson Foods effectively tricks its customers into believing they retain control over their nutrition. Due to "lax antitrust enforcement," a series of mergers between smaller companies facilitated Tyson's takeover, thereby creating "the illusion of choice," (Cusworth). When one company owns multiple brands, customers have a hard time finding locally produced alternatives, especially in grocery stores who sign contracts with big corporations. Hence, customers buying products from Like Mom's believe they receive the quality of homely cooking, but in reality consume Tyson Foods. Jean Baudrillard's Simulacra and Simulation helps unravel the psychology behind brands through the concept of simulacra, in which simulations and reality blur together to produce a hyperreality "neither true nor false," (Baudrillard). In attempting to simulate reality, originality loses all meaning, replaced by signs "exchanged for meaning," dooming Americans to "induction," "infiltration," and "illegible violence," inflicted by institutions (Baudrillard). Tyson's brands such as Like Mom's accurately exemplifies simulacra: it merely appeals to customers' nostalgia while providing none of the elements of a homely, nutritious meal. Blinded by brands, Americans unawarely continue to support Tyson without realizing the insidious effects of its harmful ingredients. The commodification of American nationalism in other Tyson brands such as Star Ranch Angus Real American Beef— decorated with red, white, and blue and described as real American beef— further supports Tyson's self-constructed image and manipulates Americans. When Tyson engages in these practices, consumers forget that the meat they masticate originates from real animals enslaved at factory farms. Livestock "spend their

entire lives confined indoors before being trucked to nearby processing plants where they will leave a short time later, packaged and unrecognizable, on their way to the nation's supermarkets and restaurants," (Harvard Law Review). Consumers do not witness the process in which live animals deteriorate into flesh, bones, and muscle, packaged into plastic; hence, Tyson Foods' products are reduced to mere simulacra. Most Americans only recall a vague idea of where meat is derived from, as a result of Tyson's tricks and methods of production. The corporation's conversion of animals into meat into simulacra simplifies beef consumption, so consumers continue purchasing from Tyson without understanding its temporarily dormant consequences.

Tyson Foods functions as an Ideological State Apparatus (ISA) by embedding itself in the American political system while also establishing a precedent for industrial meatpacking. Under the guise of its Political Action Committee TYPAC, the corporation spent "$324,977 on lobbying activity in April through June" during 2020 in exchange for "corporate immunity protections," from President Donald Trump (Gonsalves-Brown). Tyson's collusion with the White House raises ethical implications for individual employees working for the company. Both Tyson and the presidential administration share a common interest: protecting the meatpacking industry to boost the economy and maximize profits. Resultantly, the employees' voices are silenced by these entities, and they suffer from meager wages and copious work hours. Although America's political system should, in theory, accurately reflect its citizens' input, their votes are shadowed by Tyson Foods' unmatched financial budget reserved for influencing public policy. Since meat production— the industrial version that Tyson has developed— aligns with the goals of the government, policymakers subsidize meat and convince consumers of the need for meatpacking corporations. Tyson Foods' administrative officials, such as Chairman John Tyson have "given more than $90,000 to the Republican party since 2017," (Gonsalves-Brown). When company executives make contributions as such, they further corruptly influence public policy regarding their industries. These practices render Tyson Foods as one of Althusser's Ideological State Apparatuses (ISA's), which "whatever they are, contribute to the same result: the reproduction of the relations of production, i.e. of capitalist relations of exploitation,"(Althusser). The French writer argues in his book Ideology and Ideological State Apparatuses that certain institutions control the flow of culture and ideas through ideological manipulation. ISA's condition the working class people to accept the narrative propagated by those in power. Tyson Foods behaves likewise: by ensuring protection of their corporation through political connections, it validates and affirms its questionable practices. Consumers gradually succumb to the conditions subjected upon them and lose their freedom to original thought and choice. Since Tyson has the means to influence the minds of consumers, it effectively achieves its capitalistic motives while maintaining power.

Tyson's use of false advertising in conjunction with greenwashing tricks Americans into believing that its products are healthy and sustainably sourced, surreptitiously compromising their health. Tyson Foods advertised the sales of "climate-smart" beef with no substantiation, and they were sued by the Environmental Working Group and mandated to stop making these falsified claims (Gutierrez et. al). Since the climate crisis has gradually evolved into a pressing

issue, customers are more aware of the effects they induce onto the environment, so they seek to minimize damage. After realizing this cultural shift among many Americans, Tyson Foods conceived another conniving way to appeal to them. However, due to this lawsuit, the corporation is prohibited from releasing any type of claim regarding environmental protection unless a verified expert can verify its veracity for five years (Gutierrez et. al). Since making these claims are "currently impossible" "without eliminating the cattle themselves," customers are completely deceived, and they lose their right to prioritize their wellbeing (Gutierrez et. al). Tyson's manipulation perpetuates the deep-seated health crisis entrenched within America's population. When consumers buy from Tyson, they believe they support movements to protect the earth and the environment; however, they are deprived of that choice by fault of the corporation's practices. In the long term, the streamlined approach Tyson adopts inflicts deleterious effects on Americans' health. The "hormones and drugs" used to increase the "size and rate" at which the animals mature eventually deposit into consumers' bodies, unbeknownst to the artificial fattening strategies employed by Tyson (Harvard Law Review). The feed provided to the animals raised on factory farms also consists of fattening ingredients and supplements the drugs administered by Tyson Foods. Americans who lack the financial means to purchase meat of a higher caliber from traditional farms find themselves trapped by Tyson. Since beef represents a large portion of most consumers' diets and has cultural significance, they enable Tyson Foods to continue maximizing its profits at the expense of Americans. Through the combination of both greenwashing and filling animals with artificial growth enhancers, the corporation further strengthens its influence over Americans.

Tyson Foods' monopolistic control over the meatpacking industry facilitates the abusive conditions placed upon both farmers and employees who lack access to fair compensation and working conditions. The corporation produces chicken meat through contracts with farmers: it supplies "growers with chicks, feed from integrator-owned processing mills, additives, medications, veterinary services, and extensive technical instruction," (Alexander, 368). Since Tyson quickly incurs costs from the supplies they provide farmers, they must increase productivity and decrease labor costs. If Tyson raised the chickens itself, it would not profit, so they form contracts with farmers. These farmers barely break even when they grow poultry, as Tyson Foods takes most of their revenue. Most American rural towns only house one meatpacking corporation, due to the centralized control of the market, so free competition ceases to exist. If multiple companies occupied one town, farmers would be offered higher wages and favorable working conditions, but the existence of one main corporation forces them to accept its practices. Without Tyson and other chicken-packing corporations, poultry farmers would not have clients to sell their meat to. Hence, they are confined within contracts to Tyson Foods and suffer from its mechanisms of centralized control. The corporation further exploits America's political system and employees by situating plants "in 'right to work states' where unions were weaker and less expensive, non-unionized labor was available," (Saitone et. al). By taking advantage of migrant workers in states with less regulations, they propagate their power and optimize profits. The lax policies in certain states enable Tyson to lower wages and increase working hours. During the Covid-19 pandemic, Tyson Foods facilitated the spread of the virus by keeping plants open, contributing to "334 thousand COVID-19 cases across the

United States attributable to large meatpacking operations," (Saitone et. al). Even during public crises, the corporation chooses to disregard regulations and threaten the lives of its farmers and employees, thereby preserving its power.

The main efforts utilized by consumers and employees of Tyson Foods to resist its power consist of lawsuits against the corporation that hold them accountable for their corrupt actions. In 2010, chicken growers that alleged Tyson took "unfair and perhaps illegal action of their strong position in rural communities" were rewarded with "$7.3 million to ten chicken grow-out farmers" by an Oklahoma jury (Alexander, 372). If farmers around America follow the example of these ten Oklahoman farmers, they could, to an extent, thwart Tyson's power. Similarly, other groups around the United States like the "Environmental Working Group (EWG)" who pursue lawsuits against Tyson can reinforce "'the principle that consumers deserve honesty and accountability from the corporations shaping our food system,'" (Gutierrez). As a result of these actions, Tyson Foods would be forced to stop manipulating Americans and those who work for the corporation. But several limitations prevent this preferred outcome from materializing. Since Tyson possesses massive financial deposits, it effortlessly bails itself out of lawsuits because smaller organizations cannot cover costs. Tyson's extensive funds and financial budget allows it to withstand lawsuits without assuming damage. It can afford to pay legal fees, whereas smaller groups cannot, so taking the corporation to court will more likely than not punish the prosecutor rather than the perpetrator. Even if these groups win lawsuits, Tyson agrees to settle and pays its way out of these ordeals, without having to fundamentally alter their practices in most cases. Due to the lack of accountability for the individuals running Tyson Foods, it can profit while fighting legal battles against whistleblowers. Thus, policies must be instituted within America's legal system that punish the culprits of abuse rather than allowing the corporation as a whole to simply give up money. Individuals can also aid the fight against Tyson without pursuing legal action. Those who have the financial means can purchase products from local farms and butcher shops rather than supporting Tyson's factory farms. By doing so, they would protect their health while also promoting humane treatment of livestock. Choosing to not consume meat and instead follow diets strictly centered around plants would also reduce the harm Tyson inflicts. Even though Tyson Foods will likely continue its practices of deceit, Americans can resist its power dynamics through lawsuits and these other seemingly menial actions.

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Understaffed by Design: Nursing Strikes and How It Challenges the Institutional Power of Hospitals

Yichen Zhang

Hospitals are commonly seen as institutions that are dedicated to healing, safety, and compassion. Patients go to hospitals expecting professional care, and nurses are usually praised for their compassion and dedication. Especially during the COVID pandemic, nurses were celebrated as heroes, as they made sacrifices for the good of others and risked their own health to treat patients. Society has often emphasized their bravery, portraying hospitals as places for organized care where professionals work together for a common good. News outlets have highlighted nurses working multiple shifts, isolating from their families, and enduring physical and emotional strain for the sake of their patients. Yet, behind this glorified image of care, there is a system that depends on chronic understaffing and mandatory overtime to function. These conditions are presented as unavoidable circumstances of current healthcare, even though they cause burnout, moral distress, and risks to patient safety. Nurses are expected to quietly accept this stress, as if overwork is part of the job. This contradiction reveals a deeper imbalance of power within healthcare institutions. Ultimately, hospitals are able to maintain power by normalizing understaffing and mandatory overtime, but nurse strikes disrupt this authority by exposing the system's absurd logic and forcing institutions to confront how dependent the institution is on the workers they try to control.

This system mirrors the bureaucratic systems described in Catch-22 by Joseph Heller. In the novel, soldiers are trapped in a military institution governed by circular rules that protect and reinforce the system, rather than protect the individuals within it. The "Catch-22" paradox makes escape from the system and their dangerous missions impossible because every attempt to resist reinforces the logic of the authorities. Heller writes, "the enemy... is anybody who's going to get you killed, no matter which side he's on." The real threat is not necessarily the war itself or the group that the institution labels as "the enemy," but rather, it is the institution itself, which sacrifices people within the institution to reinforce itself. Soldiers are continuously told that they must keep flying because the system requires them to, and any attempt at escape is seen as selfish or "anti-patriotic." Similarly, hospitals claim that understaffing is an issue; thus, overtime is necessary to maintain care. In these circumstances, nurses are required to take on unsafe workloads because there are not enough nurses, yet the issues that drive nurses away (burnout, stress) are rarely addressed. Instead of fixing the underlying issue of understaffing, hospitals rely on the overworked nurses to fill gaps in shifts. Here, the system is the one creating the shortage and then uses that shortage to justify continued mistreatment of nurses. When nurses choose to leave because they are overwhelmed, administrators use this shortage as a reason for more overtime for the nurses. Similar to Catch-22, this logic is self-perpetuating and absurd. The system appears to be rational, while the individuals within it are the ones who are affected by the consequences of these "rational" rules.

Althusser also helps explain how hospitals can maintain their power over the nurses without any need for physical coercion. For him, institutions do not rely solely on physical oppression; instead, they can maintain control through ideology by shaping how individuals view and understand their roles. He explains how ideology is used by institutions to "discipline not only their shepherds, but also their flocks," meaning that with ideology, institutions can make people passively obey (Althusser). Individuals begin to view obedience as natural and even moral. In terms of hospitals, hospitals function as an ideological state apparatuses by framing sacrifice as professional duty and mandatory overtime as a necessity to maintain patient care. This results in nurses possibly feeling guilty for refusing unsafe work because they are taught that the patient must always come first, even when said work puts both the nurse and the patient at risk. A nurse who refuses overtime may feel as though she is abandoning her patients rather than protecting herself. Power is therefore sustained not through constant punish or threat, but through internalized expectations by convincing workers that enduring exhaustion is part of their identity, which is tied to their job.

However, ideology does not last forever. Nurse strikes across the United States reveal what happens when nurses refuse to continue to passively consent. Recently, nurses represented by the New York State Nurses Association issued a ten-day strike notice at twelve private sector hospitals only after repeated attempts at negotiation failed ("NYSNA Nurses Deliver 10-Day Strike Notice at Twelve Private Sector Hospitals in New York City"). Their press release has made it clear that unsafe staffing, mandatory overtime, and concerns about patient safety were main and central issues ("NYSNA Nurses Deliver 10-Day Strike Notice at Twelve Private Sector Hospitals in New York City"). The fact that they issued a strike notice only after negotiations failed shows that striking is not usually their first option, but rather is a last resort. Additionally, nurses at Sharp Healthcare also went on strike and were able to later ratify a four-year contract that improved staffing ratios, higher ratios, and stronger protections ("Sharp Nurses Ratify New 4-Year Contract After Historic Strike - Here Are the Terms"). These examples demonstrate that strikes are not impulsive acts of resistance; rather, they are last-resort responses to institutional neglect, especially in the case of the New York State Nurses Association strike. When nurses collectively refuse working in unsafe conditions, they gain negotiating power as hospitals are forced to recognize their dependency on nursing labor. The system that once was all-powerful becomes unstable when workers choose to not comply.

In spite of this, hospitals will also somewhat retaliate against nursing strikes by framing collective action as unethical as an attempt to retain their power over the nurses. However, research challenges this institutional narrative. A systematic review and meta-analysis by Essex et al. examined patient mortality during healthcare strikes and found no consistent increase in mortality during strike periods, which directly contradicts the claim that strikes put patients in danger. At the same time, understaffing has been shown to increase burnout and reduce job satisfaction among nurses. Allen et al. note that "each additional patient per nurse carries a 23% increased risk of burnout and a 15% reduction in job satisfaction." These numbers demonstrate how everyday, normal working conditions pose serious risks to both nurses and patients. Ratliff et al. further argue that the increasing number of healthcare worker strikes indicates long-term institutional failure to address staffing and safety concerns. From this, onlookers can see how hospitals, as an institution, can twist the narrative so that

they can gain more public support by labeling the nurses as irresponsible, while the hospital itself retains a reputation of being rational and "in the right." The absurdity lies in the fact that everyday harm is ignored, but the "harms" of resistance is exaggerated.

Yet even as hospitals frame striking nurses as the "bad guy" or being "in the wrong," the extent of hospital dependence on nurses becomes especially apparent during these strikes. In an article by Allen et al., who write from the perspective on hospital administrators and leadership, they admit that "in defining care delivery areas that were critically dependent on our nurses, [they] gained tremendous respect for their contribution to patient care." This statement comes off as striking because it comes from the administrators of hospitals, the very people who "run" the institution, not union advocates. The article describes how hospitals have to activate emergency response teams, reorganize staffing, delay procedures, and secure replacement nurses to simply maintain operations during a nursing strike (Allen et al.). These preparations expose how the institution is actually quite fragile. Hospitals may be able to project authority, but nurses make up the foundation of this authority, and strikes expose this vulnerability. When this institution loses its labor force, the illusion of an all-powerful and stable institution collapses.

But despite this acknowledgement of the hospital's dependency on nurses, the system's power doesn't just stop at the workplace; it extends beyond the hospital and into nursing school. According to CNN journalist Tami Luhby, "nearly 78,200 qualified applications were not offered spots at nursing schools last year," even during a national nursing shortage. This number demonstrates that the shortage of nurses is not due to a lack of interest in the profession, but by structural limits, like limited faculty and funding, some of which are dependent upon hospitals themselves. Yet hospitals often cite staffing shortages as justification for overtime, while also being part of the cause of the problem. In this way, institutional power, by extending into education, can reproduce scarcity, resulting in shortages being both a problem and an excuse to reinforce the cycle of overtime. By creating the crisis, the system can then use that crisis to maintain control over its workers.

Fortunately, there are possible solutions to combat the institutional power of hospitals. Legally enforced nurse-to-patient ratios could prevent hospitals from continuing to normalize unsafe staffing levels and reduce burnout. Limits on mandatory overtime could protect both nurses and patients from the possible risks of burnout. And increased funding for nursing schools and clinical placements could address nursing shortages from the root, instead of having overtime as a long-term solution. However, these reforms would be hard to implement since these changes, by nature, will challenge the institution itself, nor do these changes target the profit-driven nature of the healthcare industry as a whole. Changes in the system will require for the system/institution to admit that cost-reduction cannot come before safety. Any meaningful change would need to force hospitals to rethink their logic that treats nurses as another cog in the machine rather than human beings.

This pattern seen in healthcare is not isolated. A similar situation appears in education, particularly public education, where teachers strikes across the United States are also common. Teachers, like nurses, are praised for their dedication and compassion, but often work in similar

conditions of nurses: overcrowded classrooms due to understaffing, limited funding, low wages that aren't enough to meet their surrounding area's cost of living, and exhaustion (The Associated Press). When teachers strike, they are frequently accused of harming the students, just like how nurses are accused of harming patients (Pioneer Institute). In both cases, institutions rely on workers', whether it'd be a nurse or a teacher, sense of duty to maintain systems that are underfunded and whose workers are stretched too thin. So, resistance becomes necessary when institutional demands exceed what these workers can endure. Both nurse strikes and teacher strikes demonstrate a broader phenomenon, which is that institutions depend on compliance to survive, and when those within the institution notice that they are just simply being used by the institution and not seen as a person or human, this compliance ends and the weaknesses of the institution are shown.

Ultimately, nurse strikes expose the absurdity of the healthcare system, which claims to prioritize care while relying on the exhaustion of its workers to survive. Like the bureaucratic system in Catch-22, hospitals maintain authority through circular logic and implicit consent. When nurses stop consenting and refuse to endure working in unsafe conditions, they interrupt the system's logic and expose the fragility of the institution. The illusion of power and stability ends once their compliance ends. Strikes demonstrate that systems depend on their workers a lot more than it seems, and that these institutions are not ethical since they are sustained by the exploitation of labor. The same pattern appears in teacher strikes where collective actions forces institutions to confront their dependence on the workers they try to control. By refusing to accept understaffing and mandatory overtime as normal working conditions, nurses challenge not just hospitals and hospital administrations, but broader logic of institutional power, showing how power is maintained through compliance, and compliance can be withdrawn.

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