Editor's Note

Welcome to the third issue of Academus. This issue runs a common thread beneath its varied subjects: how do we know what we know, and what follows when that knowledge drives power? From the abstract logic of belief and luck to the very concrete politics of artificial intelligence, from a forgotten theater of World War II to the most consequential demographic experiment in modern history, our authors test ideas not only for their internal coherence but also for their human stakes. We are grateful to the writers and reviewers who made this volume possible, and we hope these pages push you to question carefully, argue honestly, and submit something of your own.

We open with Sophia Wang's "An Alternative Approach to Regulating Artificial Intelligence," which argues that technology-based AI regulation is both practically unworkable and economically harmful. Without a stable definition of AI, Wang contends, technology-specific rules cannot function; without a risk-based alternative, they will stifle innovation while entrenching incumbents. The EU's AI Act, flawed as it is, points toward a better model.

Jacob Eisenstein's "Artificial Intelligence as GPT" places AI within the long history of general-purpose technologies, from steam to electricity to computing. Eisenstein argues that AI's digital nature and near-zero marginal costs make its adoption significantly faster and more volatile than those of prior GPTs. That speed amplifies both the upside, in productivity gains and new entrepreneurial opportunities, and the downside, in inequality, market concentration, and geopolitical asymmetry.

In "The Zhejiang-Jiangxi Campaign," Mingxue Qiao recovers the largely forgotten Chinese cost of the 1942 Doolittle Raid. The Japanese military's retaliatory campaign killed approximately 250,000 civilians, deployed biological weapons on a scale described as the most significant biological warfare campaign ever conducted, and reduced entire cities to ruin. Qiao argues that any honest accounting of the raid must place these costs alongside its celebrated moral effects.

Sam Cao's "Why One Child?" traces the origins of China's one-child policy to three interlocking forces: the ideological exhaustion left by Mao's catastrophic campaigns, the Western overpopulation panic of the 1960s and 70s, and the entrenchment of scientism as a governing philosophy inside the CCP. The piece shows how Song Jian's cyberneticists, armed with impressive mathematics and unreliable data, crowded out social scientists and produced a policy whose social consequences they never seriously considered and which proved less effective than the more moderate regime it replaced.

Yichen Wang's "Skepticism about Expert Identification" confronts the circularity at the heart of novice-expert relations: you cannot identify an expert without already being one. Wang grants the difficulty, then argues that the skeptical standard collapses under its own logic. Second-order indicators, credentials, institutional affiliation, peer endorsement, and track records are imperfect but indispensable. Defeasible trust within self-correcting social networks, not epistemic autonomy, is how knowledge actually spreads.

We close with Kyle Chang's "The Incompatibility of Luck and Knowledge," which examines Gettier cases and the challenge they pose to the justified true belief account of knowledge.

Chang walks through the Safety Theory's response: that a belief counts as knowledge only if it holds true across nearby possible worlds, a condition that blocks the bad-luck-plus-good-luck pattern. Gettier cases exploit this.

Finally, we are indebted to the teachers, mentors, and reviewers who made this third issue possible and to the authors who trusted us with their work. If something here makes you want to argue, write it down, and send it in. May these pages invite careful thinking, charitable disagreement, and scholarship that carries beyond these covers.

Veritas · Ratio · Sapientia

Sincerely,
    Sam Cao, Editor-in-Chief

Contents

An Alternative Approach to Regulating Artifical Intelligence

Sophia Wang

Monte Vista High School

Much like the Internet revolution, the rise of artificial intelligence (AI) is changing how we live and work, with profound and far-reaching implications for the global economy, culture, and politics. At the same time, this change has spurred concerns, such as job displacement, bias, misinformation, and privacy, leading many to call for increased AI regulation (Meltzer). More specifically, many have called for the regulation of particular (Biden; African Union Development Agency). In this essay, however, I argue against such regulations, advocating for a risk-based approach to regulate harmful technologies.

There are two main issues with technology-based regulation of AI: the lack of a clear definition and negative economic impacts.

First, "artificial intelligence" is an ill-defined term. In everyday language, AI typically refers to Large Language Models (LLMs) such as ChatGPT (Henman p. 2). However, there are other forms of AI, such as expert systems, which many proponents of technology-based regulation dismiss as being "just a bunch of if-statements" (Braun p. 4). Nonetheless, this broad range of applications makes it nearly impossible to create a definition of AI that is both precise and comprehensive enough for effective regulation. Without a common definition of AI, regulation becomes impractical.

Second, regulations hamper innovation and hurt economies. Several studies found that regulations cut down the number of new firms, slow employment growth, and reduce innovation, all of which are key to increasing productivity and promoting economic growth (Bailey and Thomas pp. 7–11; Aghion et al. p. 45). The increased costs of regulation also prevent small firms from challenging larger ones, thereby stifling competition (Carney). Under the guise of promoting safety, entrenched businesses use regulations to maintain dominance in the market.

Clearly, any attempt to directly regulate AI is problematic. However, there is an alternative: risk-based regulation, i.e., regulating a wide range of technologies based on their risk level, irrespective of the type of technology. This risk-based approach holds many advantages over technology-based regulation, as it can account for the specific circumstances in which a technology is used, as well as having minimal impact on innovation and economic growth (Marcinek et al.; Bradford). For example, instead of a technology-based ban on all facial recognition software, a risk-based approach might allow its use in highly controlled security settings, such as airports, while prohibiting its use for general surveillance in public spaces. Furthermore, with a risk-based approach that focuses only on high-risk applications, the regulatory burden for low-risk applications of AI is reduced, encouraging their development and deployment (Ebers p.. 4–6). Recently, the EU has put this approach into practice with the so-called "AI Act" (*Artificial Intelligence Act*). Although the act lacks a risk-reward analysis and a

concrete definition for "risk," it represents a significant step forward in AI regulation, offering a potential model for other jurisdictions to imitate.

As the use of AI across the world becomes progressively more prevalent, it becomes increasingly important to regulate its use and prevent its abuse. Ultimately, it is through adaptable, risk-based regulations that we can ensure that AI serves humanity's best interests in the years to come.

References

African Union Development Agency. AUDA-NEPAD White Paper: Regulation and Responsible Adoption of AI in Africa towards Achievement of AU Agenda 2063. 2023. https://dig.watch/resource/auda-nepad-white-paper-regulation-and-responsible-adoption-of-ai-in-africa-towards-achievement-of-au-agenda-2063.

Aghion, Philippe, et al. "The Impact of Regulation on Innovation". *American Economic Review*, vol. 113, no. 11, Nov. 2023, pp. 2894–936. https://doi.org/10.1257/aer.20210107, https://doi.org/10.1257/aer.20210107.

Artificial Intelligence Act. June 2024, p. 144.

Bailey, James B., and Diana W. Thomas. "Regulating Away Competition: The Effect of Regulation on Entrepreneurship and Employment". *Journal of Regulatory Economics*, vol. 52, no. 3, Dec. 2017, pp. 237–54. https://doi.org/10.1007/s11149-017-9343-9, https://doi.org/10.1007/s11149-017-9343-9.

Biden, Joe. Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence. Nov. 2023. https://www.federalregister.gov/documents/2023/11/01/2023-24283/safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence.

Bradford, Anu. The Race to Regulate Artificial Intelligence. June 2023. https://www.foreignaffairs.com/united-states/race-regulate-artificial-intelligence-sam-altman-anu-bradford.

Braun, Daniel. "Why 'Artificial Intelligence' Should Not Be Regulated". *Digital Government: Research and Practice*, Sept. 2024. https://doi.org/10.1145/3696010, https://doi.org/10.1145/3696010.

Carney, Timothy P. Regulations Protect Entrenched Businesses — and the New York Times Is on It. Dec. 2012. https://www.aei.org/articles/regulations-protect-entrenched-businesses-and-the-new-york-times-is-on-it/.

Ebers, Martin. "Truly Risk-Based Regulation of Artificial Intelligence: How to Implement the EU's AI Act". *European Journal of Risk Regulation*, Nov. 2024, pp. 1–20. https://doi.org/10.1017/err.2024.78, https://doi.org/10.1017/err.2024.78.

European Central Bank. How Does Innovation Lead to Growth? Nov. 2021. https://www.ecb.europa.eu/ecb-and-you/explainers/tell-me-more/html/growth.en.html.

Henman, Paul. "Improving Public Services Using Artificial Intelligence: Possibilities, Pitfalls, Governance". *Asia Pacific Journal of Public Administration*, vol. 42, no. 4, Oct. 2020, pp. 209–21. https://doi.org/10.1080/23276665.2020.1816188, https://doi.org/10.1080/23276665.2020.1816188.

Marcinek, Krystyna, et al. Risk-Based AI Regulation: A Primer on the Artificial Intelligence Act of the European Union. Nov. 2024. https://www.rand.org/pubs/research_reports/RRA3243-3.html.

Meltzer, Joshua P. The US Government Should Regulate AI If It Wants to Lead on International AI Governance. May 2023. https://www.brookings.edu/articles/the-us-government-should-regulate-ai/.

Artificial Intelligence as GPT: Effect on Economics and Societes

Jacob Eisenstein

Skyline High School

2.1   Introduction

Throughout human history, the most transformative drivers of innovation and development have been general-purpose technologies (GPTs): GPTs such as steam, electricity, and computers have generated rapid economic growth and caused widespread social restructuring (Bresnahan and Trajtenberg p. 0). Over the past decade, many have coined Artificial Intelligence (AI) as the latest GPT. However, I contend that there are key differences between AI and past GPTs. While AI has the same broad applicability and potential for economic impact as previous GPTs, its adoption will be significantly faster and more volatile because of its digital nature, near-zero marginal costs, and wide scope of application. Accordingly, its economic impact will be more rapid, disruptive, and polarizing and will require proactive institutional adaptation to avoid inequality and market concentration.

2.2   Context & Analytical Framework

First, a brief history of the GPTs considered in this study. One of the first GPTs of the modern era was steam power. Developed in England in the late 18th century, steam initially had a negligible impact on overall productivity and economic growth and was limited to a few industries prior to the 1830s. It was only in the mid-19th century, when high-power steam engines and complementary technologies such as railways and steamships were further improved, that productivity surged. From 1870 to 1910, steam accounted for approximately 29 percent of productivity growth in the UK (Crafts p. 524). Electricity followed a similar trend. Despite becoming commercially viable in the late 19th century, the technology did not have a prominent effect on productivity until the 1920s and 1930s, when adoption rates surged to approximately 23 percent of firms in the US, contributing to around 10 percent overall productivity growth per annum (Filippucci et al. pp. 16–17). In contrast, the adoption of semiconductor-based computing occurred much faster than that of previous technologies. Within a little more than a decade from its initial commercial viability in the late 1970s and the 1980s, US labor productivity growth rose from approximately 1.6 percent per year (1974–1995) to over 3 percent (1995–2004) (Crafts p. 525). Merely ten years after the personal computer's introduction, approximately 40 percent of US firms were using computers (Filippucci et al. p. 16).

We now define some characteristics that all GPTs share. A general-purpose technology is a single foundational innovation that is pervasive, improvable, profitability-enhancing, and broadly spillover-generating (Crafts p. 521). Commonly, GPTs follow an S-curve style of adoption: initially, the technology struggles with diffusion because firms are reluctant to upend their existing operations, but as it improves and prior investments mature, adoption accelerates before eventually plateauing as markets reach saturation and most potential adopters have already transitioned (see fig. 1). A key driver of this process is the continual improvement of GPTs over time, which increases the incentive for firms to adopt them (Bresnahan and Trajtenberg p. 5). Along with technological development, GPTs often create complementary innovations. The invention of electricity, for example, led to the creation of light bulbs, batteries, and electric vehicles. In this way, GPTs produce a wealth of entrepreneurial opportunities, in both directly related and adjacent industries.
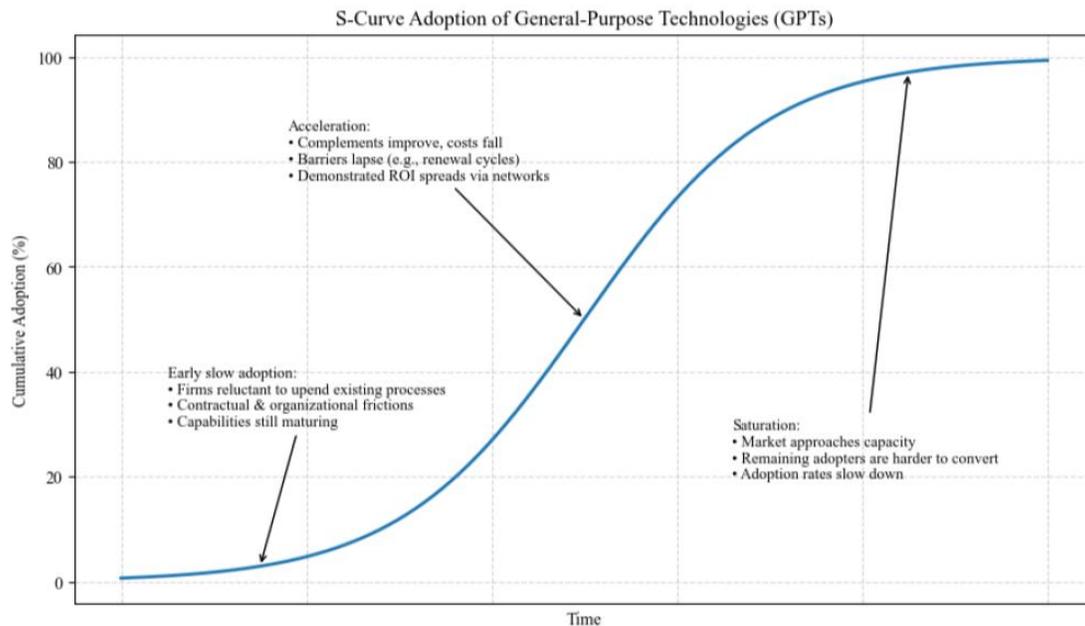

Figure 2.1: The S-curve of GPT Adoption. Source: Author's illustration.

Similar drawbacks also appear between AI and earlier GPTs. For example, GPTs tend to increase the share of output allocated to capital owners, thereby increasing inequality. This occurred during the steam-driven British Industrial Revolution, when the share of profits in GDP allocated to capital owners rose from 17.2 percent in 1770 to 29.5 percent in 1860 (Crafts pp. 526–528). Additionally, GPT development can occur unevenly across the world, producing long-lasting disparities: in 2023, 95 percent of global AI research was carried out by the US, excluding China (David pp. 18–19).

Having surveyed the similarities, let us elucidate the differences between GPTs, which we can measure using the following metrics: adoption speed and diffusion channels, complementary assets and infrastructure, impact on productivity, impact on labor, impact on market structure, and impact on regulation and society.

2.3   Comparative Analysis

2.3.1   Adoption Speed

One of the most apparent differences between AI and previous GPTs is their adoption speed. Steam and electricity require capital-heavy investments. Steam, in its most common forms—the steamboat and steam train—entails high fixed costs and significant physical infrastructure. Likewise, electricity requires the construction of costly power plants and transmission grids. The adoption of computers necessitated lower initial costs, although their adoption still necessitated major changes to organizational processes, software systems, and data architecture. In contrast, the adoption of AI is much faster. From 2024 to 2025, AI adoption in the US rose from 4 percent to 6 percent; if this trend continues, AI is predicted to reach approximately 50–60 percent adoption within the decade (Filippucci et al. p. 17).

Several factors explain this rapid adoption rate. First, distribution is digital and incurs low marginal cost: firms can call APIs or deploy managed services without owning costly infrastructure (Erdil and Besiroglu p. 9; Brynjolfsson et al., Artificial Intelligence and the Modern Productivity Paradox: A Clash of Expectations and Statistics p. 21). In the past two years, the cost of quality-adjusted AI models has declined by over 80 percent, enabling firms to access cutting-edge technologies at only a fraction of their previous expense (André et al. p. 8). Second, open-source frameworks further lower entry barriers, widening participation beyond that of large incumbents. This counteracts the expected concentration of power in the hands of the first innovators, which was typical of earlier GPTs. Third, AI's learning curve is comparatively shallow: natural-language interfaces allow non–experts execute complex tasks with little to no training, which generates especially large gains for less-experienced (Filippucci et al. p. 17) users. This is not to say that AI has no structural requirements; rather, AI's constraints differ from those of earlier GPTs. Instead of extensive hardware, for AI, diffusion depends on intangible complements such as data governance, data quality, model deployment, and systems monitoring (Brynjolfsson et al., Artificial Intelligence and the Modern Productivity Paradox: A Clash of Expectations and Statistics pp. 4–10). Consequently, as with prior GPTs, the technology is still likely to exhibit a productivity J-curve: early investments in complements and learning depress measured gains before benefits arrive, but the trough should be shallower and shorter because less investment in physical infrastructure is required (see fig. 2) (The Productivity J-Curve: How Intangibles Complement General Purpose Technologies).

2.3.2   Economic Impacts

A point of similarity between AI and past GPTs is their impact on labor. Both steam and electricity and their complementary tools displaced manual labor while expanding industrial employment (Agrawal et al. p. 155; Soroushian) Thus, labor productivity rose with adoption,
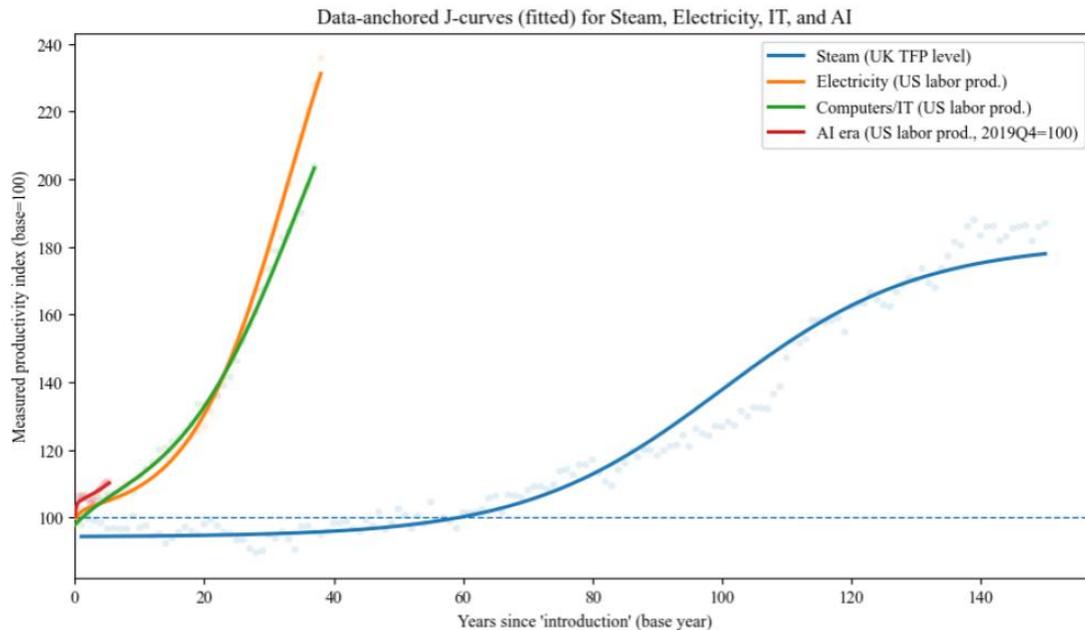
Figure 2.2: Graph comparing the J-curve of GPTs, 1761–2025. Source: Author's calculations using Bank of England, TFPGUKA (via FRED, Federal Reserve Bank of St. Louis); U.S. Bureau of Labor Statistics, OPHNFB (via FRED); and Gene Smiley, "The U.S. Economy in the 1920s," EH.Net Encyclopedia.

leading to rising wages over time (David pp. 14–15). Computers automated routine cognitive tasks, such as bookkeeping, data entry, and basic automate an even larger share of tasks as it can perform non-routine cognitive functions (Agrawal et al. p. 156). However, although it is likely to cause short-term job displacement, permanent job loss is improbable. Historically, GPTs have primarily caused reallocation across sectors rather than outright unemployment. Furthermore, like past GPTs, AI will likely create new tasks, most likely related to prompting, oversight, evaluation, and data stewardship (Crafts p. 526). What is certain is that AI will raise individual productivity, with generative models producing a 30–60 percent productivity gain depending on the task (Filippucci et al. p. 9). For an individual worker, there are two possible non-exclusive outcomes. First, owing to AI's shallow learning curve, labor productivity may be boosted broadly, reducing inequality (Agrawal et al. p. 155). Second, because of its skill-amplifying nature, already productive workers and firms may become even more productive, thereby widening the skill gap (Brynjolfsson et al., *Artificial Intelligence and the Modern Productivity Paradox: A Clash of Expectations and Statistics* pp. 8–9). Which of the two effects takes hold will depend on institutional factors, such as the efficacy of education systems, labor market policies, and access to AI technologies.

Regulation is a primary influence on the pace and impact of AI development. In previous GPTs, safety and competition regulations evolved alongside the technology. In the UK, the Factory Acts were passed to protect workers using steam engines in factories; likewise, in the US, antitrust statutes prevented electricity monopolies from stifling competition (UK Parliament). AI is likely to be subject to similar regulations, perhaps to an even greater degree (Erdil and Besiroglu pp. 9–10). Regulation's effect is nuanced: clear, risk-based rules can accelerate adoption by building public and organizational trust, while vague or heavy ex-ante requirements can slow adoption rates and entrench incumbents. The economic trajectory of AI thus hinges on regulatory design and the balance of productivity benefits against the risks of polarization and market concentration.

2.4   Conclusion

AI shares many similarities with previous GPTs. For instance, it can reorganize economics and catalyze waves of complementary innovation while maintaining the fundamental structure of the labor market. Simultaneously, its ease of distribution makes its adoption swifter and more unpredictable. Such speed magnifies both the potential gains in terms of broad productivity gains, new entrepreneurial opportunities, and greater accessibility, and the potential risks, including inequality, market concentration, and geopolitical asymmetries. History shows that GPTs rarely deliver equitable progress without sound policy intervention. Therefore, we must focus on designing effective and equitable regulations, both on a national and international scale, to ensure that AI's benefits are maximized while its downsides are minimized. AI is a powerful tool that can reshape the course of human progress, but only if used correctly.

References

Agrawal, Ajay, et al. "Do We Want Less Automation?" *Science*, vol. 381, no. 6654, 2023, pp. 155–58. https://doi.org/10.1126/science.adh9429, https://doi.org/10.1126/science.adh9429.

André, Christophe, et al. *Developments in Artificial Intelligence Markets: New Indicators Based on Model Characteristics, Prices and Providers*. OECD, 2025, https://doi.org/10.1787/9302bf46-en, https://doi.org/10.1787/9302bf46-en. OECD Artificial Intelligence Papers 37.

Bank of England. Total Factor Productivity Growth in the United Kingdom. Mar. 2018. https://fred.stlouisfed.org/series/TFPGUKA.

Bresnahan, Timothy F., and M. Trajtenberg. "General Purpose Technologies 'Engines of Growth'?" *Journal of Econometrics*, vol. 65, no. 1, 1995, pp. 83–108. https://doi.org/10.1016/0304-4076(94)01598-T, https://doi.org/10.1016/0304-4076(94)01598-T.

Brynjolfsson, Erik, et al. *Artificial Intelligence and the Modern Productivity Paradox: A Clash of Expectations and Statistics*. National Bureau of Economic Research, Nov. 2017, https://doi.org/10.3386/w24001, https://doi.org/10.3386/w24001. Working Paper Series 24001.

———. *The Productivity J-Curve: How Intangibles Complement General Purpose Technologies*. National Bureau of Economic Research, Oct. 2018, https://doi.org/10.3386/w25148, https://doi.org/10.3386/w25148. Working Paper Series 25148.

Crafts, Nicholas. "Artificial Intelligence as a General–Purpose Technology: An Historical Perspective". *Oxford Review of Economic Policy*, vol. 37, no. 3, 2021, pp. 521–36. https://doi.org/10.1093/oxrep/grab012, https://doi.org/10.1093/oxrep/grab012.

David, P. A. *Computer And Dynamo: The Modern Productivity Paradox In A Not-Too Distant Mirror*. University of Warwick, 1989, https://ideas.repec.org//p/wrk/warwec/339.html. The Warwick Economics Research Paper Series (TWERPS).

Erdil, Ege, and Tamay Besiroglu. Explosive Growth from AI Automation: A Review of the Arguments. 2023. *arXiv*, https://doi.org/10.48550/arXiv.2309.11690, https://doi.org/10.48550/arXiv.2309.11690.

Filippucci, Francesco, et al. *Macroeconomic Productivity Gains from Artificial Intelligence in G7 Economies*. OECD, 2025, https://www.oecd.org/en/publications/macroeconomic-productivity-gains-from-artificial-intelligence-in-g7-economies_a5319ab5-en.html. OECD Artificial Intelligence Papers.

National Archives. Sherman Anti-Trust Act (1890). Sept. 2021. https://www.archives.gov/milestone-documents/sherman-anti-trust-act.

Nordhaus, William D. "Are We Approaching an Economic Singularity? Information Technology and the Future of Economic Growth". *American Economic Journal: Macroeconomics*, vol. 13, no. 1, 2021, pp. 299–332. https://doi.org/10.1257/mac.20170105, https://doi.org/10.1257/mac.20170105.

Smiley, Gene. "The U.S. Economy in the 1920s". *EH.Net Encyclopedia*, edited by Robert Whaples, June 2004, https://eh.net/encyclopedia/the-u-s-economy-in-the-1920s/.

Soroushian, John. What Past Waves of Automation Can Teach Us About AI. July 2024. https://bipartisanpolicy.org/blog/what-past-waves-of-automation-can-teach-us-about-ai/.

UK Parliament. The 1833 Factory Act. Accessed: 2025-08-16. https://www.parliament.uk/about/living-heritage/transformingsociety/livinglearning/19thcentury/overview/factoryact/.

U.S. Bureau of Labor Statistics. Nonfarm Business Sector: Labor Productivity (Output Per Hour) for All Workers. Aug. 2025. https://fred.stlouisfed.org/series/OPHNFB.

The Zhejiang–Jiangxi Campaign

Mingxue Qiao

Shanghai No. 8 High School

On the 18 of April 1942, 16 B-25 bombers were launched from the USS Hornet towards the Japanese archipelago. Led by Colonel James Doolittle, the Doolittle raid's purpose was twofold: retaliation for the Pearl Harbor attack four months prior, and instilling uncertainty into the Japanese populace (Doolittle and Glines p. 10). Although the physical damage caused by the raid was insignificant, its impact on American morale cannot be understated (Scott, *Target Tokyo: Jimmy Doolittle and the Raid That Avenged Pearl Harbor* chap. 18).

Nevertheless, what is often left out of the narrative is the retaliatory campaign the Japanese launched following the Doolittle raid. In the Zhejiang-Jiangxi region of China, around 250,000 civilians were massacred, property was destroyed wholesale, and deadly biological weapons were indiscriminately used (National Museum of the Pacific War p. 385). I argue that the consequences of the Doolittle raid should be reevaluated, in light of the immense devastation in the aftermath of the Doolittle raid.

The history of Sino-American collaboration preceding direct US involvement in the Pacific War can be traced back to a combination of events in the late 1930s. Heretofore, despite friendly relations with China and a distaste for Japanese militarism, the US withheld support from the Chinese. The reasoning was threefold: First, fueled by the trauma of the First World War and the economic downturn brought about by the Great Depression, the US had adopted an isolationist foreign policy (Office of the Historian, Milestones in the History of U.S. Foreign Relations). Second, the squabbles between the Communist and Nationalist parties added a factor of uncertainty *vis-à-vis* the idea of transmitting aid (Doolittle). Third, the US had no strategic interests in China and feared provoking a Japanese response (Cannon et al. p. 69–70). In 1937, however, two events caused public opinion to turn decisively pro-Chinese: the Marco Polo Bridge Incident, which reignited Sino-Japanese hostilities; and the sinking of the gunboat USS Panay by Japanese bombing attacks (Wright and Nelson pp. 47–54).

From that point on, the US became increasingly involved in the war. On 27 September 1940, Japan signed the Tripartite Pact, becoming an official member of the Axis (The Editors of Encyclopaedia Britannica, Tripartite Pact | Definition, History, Significance, & Facts | Britannica). By mid-1941, the American Volunteer Group, otherwise known as the "Flying Tigers", arrived in China and began offering informal assistance to the Nationalists (Doubek). Later in August, the US enacted a ban on oil exports to Japan, citing a reluctance in shipping oil to "aggressor countries" (Feis p. 74; Roosevelt). By December, the shortage of American imports finally prompted an aggressive Japanese response in the form of the Pearl Harbor attack on December 7, 1941, officially bringing the US into the Second World War (The Mary and Jeff Bell Library and Texas A&M University-Corpus Christi). Nonetheless, having caught the allies off-guard, the Japanese came to amass a sweeping empire stretching across the entire pacific by spring of 1942 (The National WWII Museum, The Pacific Strategy, 1941–1944).

In response to the growing Japanese threat, President Franklin D. Roosevelt, collaborating with his military advisors, devised plan intended to both crush Japanese morale and reinvigorate the American war effort (Glines, *The Doolittle Raid* p. 10). They planned to secretly send bombers to attack the Japanese mainland, without the protection of fighter aircraft. US fighter aircraft at the time lacked the ability to serve as long distance escorts, thus, it would have been extremely risky to deploy fighters for such a long-range operation (Rogers). James Doolittle, an experienced flight instructor and test pilot, was chosen to lead the operation (The Editors of Encyclopaedia Britannica, James H. Doolittle | World War II, Medal of Honor, Aviation Pioneer | Britannica). Initially, he had suggested that the bombers land in Vladivostok (Glines, *The Doolittle Raid* p. 27). However, this was deemed to be impossible, as the Japanese had signed a neutrality pact with the Soviets back in 1941 (Molotov et al.). It was then decided that the bombers would land in China, despite the fact that the airplanes would have to fly an additional 1,100 kilometers, and fierce Chinese resistance to this idea (The Editors of Encyclopaedia Britannica, Doolittle Raid; Chun p. 32; Glines, *The Doolittle Raid* p. 27). Chiang Kai-shek, the leader of Nationalist China protested against raid, stating that such action would incite Japanese aggression, giving them a *casus belli* to overrun the Chinese airfields and their respective provinces (Taylor p. 209). However, by that point, the plan could not be altered. It had been decided that the airplanes would land first in the Zhejiang and Jiangxi provinces, refuel, then make their way to Chongqing (Chungking) (Chun p. 32). Having constructed a plan, the carrier taskforce set sail April 1, 1942 (Craven and Cate p. 440).

On the 18th of April, 1942, one day before the planned date of the attack, however, the naval task force was spotted by a Japanese picket boat (p. 442). The picket boat radioed Tokyo, notifying the military of an impending attack (Chun p. 45). Despite having lost the element of surprise and being around 500 kilometers farther away than the predetermined launching spot, the bombers had to be immediately released (Correll). The Japanese high command failed to consider the possibility of an attack, observing the immense distance of the taskforce from the Japanese mainland; thus, the bombers faced no opposition (Craven and Cate p. 441). Upon reaching Tokyo, Nagoya, Ōsaka, plus other minor targets, they were able to complete the mission while meeting minimal resistance (Army Air Forces).

Following the successful attacks, most of the raiders proceeded South towards the Chinese mainland (The Editors of Encyclopaedia Britannica, Doolittle Raid). Though, due to their early launch, none of the remaining planes had enough fuel to reach their intended refueling stops. As such, the aircraft crash-landed at various locations in the Zhejiang and Jiangxi provinces [Doolittle Raid; Doolittle].

Now, stranded in an active warzone, the crashed airmen turned to Chinese resistance fighters, who played an important role in ensuring the safe transportation of American airmen away from the frontlines. Of the 75 airmen who landed in Chinese territory, 64 were rescued by civilians and guerilla fighters who offered medical assistance, meals, and provided escorts to Chongqing (Leng; Walsh). As Lee Chennault, the leader of the Flying Tigers recorded in his memoir, "There are hundreds of American pilots and crewmen alive today who owe their lives to the aid of Chinese, farmers, guerrillas, and soldiers who guided them back to safety knowing full well that the price of detection was death for themselves, their families, and their community" (Hotz p. 169). After the war, gunner and engineer David Thatcher recalled, "They did not have anything, but they gave us all they had" (Zhuang).

Despite this, the fate of those who were captured by the Japanese military did not fear so well. Provisions were instituted by the Japanese government, applicable specifically towards the captured Doolittle raiders (Liverpool p. 70). It was stated that any air attack, "upon ordinary people, upon private property of a non-military nature, against other than military objectives, and [as a] 'violation of war-time international law'" would be punishable by death, or a prison sentence exceeding ten years (pp. 70–71). Four of the captured raiders perished in the hands of the Japanese: three being executed under the aforementioned provisions, and the other dying of dysentery (The Editors of Encyclopaedia Britannica, Doolittle Raid).

The Japanese military, infuriated by the boldness of the raid, launched the Zhejiang-Jiangxi campaign on May 15th, less than a month after the events of the attacks on the Japanese mainland (Schoppa p. 386). While the official rationale for the offensive was to destroy Chinese air bases threatening he Japanese mainland, the viciousness of this campaign speaks to an ulterior motive – retribution for the Doolittle raid (Scott, *Target Tokyo: Jimmy Doolittle and the Raid That Avenged Pearl Harbor* pp. 375–376). The Japanese, with some 180,000 men in total, advanced upon the provinces of Zhejiang and Jiangxi. They moved along the Zhejiang-Jiangxi railway and occupying areas such as Quzhou (Chuchow), Yihuang (Ihwang), Nancheng, and Yushan (see fig. 2) (Schoppa p. 28; Carter; Zhao).

Aside from destroying the intended airbases, the Japanese also looted and razed towns and cities they happened across (Scott, *Target Tokyo: Jimmy Doolittle and the Raid That Avenged Pearl Harbor* chap. 22). "They shot any man, woman, child, cow, hog, or just about anything that moved," As Father Wendelin Dunker, a priest residing in Ihwang described of the town, "They raped any woman from the ages of 10-65" (p. 381). The city of Nancheng was subjected to similar travesties, as over 800 women were rounded up and regularly assaulted in a storehouse outside of the city (The Doolittle Raid Generated More Ripples than Once Thought p. 382). In Quzhou, the Japanese began a campaign of what can only be described as deliberate genocide, killing around 10,000 and displacing a further 30,000 (*Target Tokyo: Jimmy Doolittle and the Raid That Avenged Pearl Harbor* p. 385). As Father Bill Stein, another priest, described of the town of Yushan, "Now you can walk thru street after street seeing nothing but ruins, … In some places you can go several miles without seeing a house that was not burnt…" (p. 385). The town, which had a population of 70,000, saw over 80% of its homes destroyed (Yamamoto p. 166). Furthermore, not only was the brutalization being carried out on communal levels, but atrocities of similar degrees were also likewise committed on individual scales.

Again, examples of such terrorization abound, including instances of elderly individuals being pushed off bridges in Yujiang (Yukiang) and being used as target practice; those who were not shot, drowned (Scott, *Target Tokyo: Jimmy Doolittle and the Raid That Avenged Pearl Harbor* p. 382). In Linchuan (Linchwan), corpses of families were tossed into wells, contaminating the local water supply (p. 383). There were even reports of soldiers unearthing, looting, then destroying graves in Yintang (p. 383). The Japanese troops made the utter ruination of all that they came upon a primary objective, demonstrating that their true intent during this campaign far exceeded the supposed goal of national security.

Punishments were especially severe for those discovered to have aided Americans. There were accounts of individuals coerced into a "bullet contest", where a group of ten individuals was forced into a line, then penetrated by a single bullet (p. 384). Some were burned alive, and others beheaded (*Target Tokyo: Jimmy Doolittle and the Raid That Avenged Pearl Harbor* p. 384; China Daily). In a cruel twist of fate, it was often the little trinkets and items left as a gift of

gratitude that led to the identification of those who assisted the Americans (China Daily). Aside from utilizing the traditional methods of destruction, Japanese forces also deployed biological weapons to such an extent that it has been cited as "the most significant BW [Biological Warfare] campaign ever conducted" (Carus p. 19).

Unit 731 utilized vaporized versions of infections, spreading them in wells and rice fields, even leaving contaminated foodstuffs for the inhabitants to find (Tanaka p. 138; Chevrier et al. p. 19; Carus p. 18). During the outset of the offensive, special aircraft released *Y. pestis*, which causes plague, around the area of the Zhejiang-Jiangxi railroad (Carus p. 18). It is reported that the Chinese army suffered casualties of up to 30,000, and among the Japanese themselves, over 10,000 were infected and around 1,700 died of their infections (Tohmatsu p. 427). As General Shiro Ishii, microbiologist and overseer of Unit 731, stated bluntly, "The bacteria weapons used in Zhejiang-Jiangxi War Zone were very effective, causing several fierce epidemics" (Pacific Atrocities Education, The Bacteriological Warfare on China; PBS). Needless to say, the devastation brought about by such vicious weapons was ineffable.

Having successfully captured and destroyed the enemy airfields, the Japanese began their withdrawal on August 15th, while being counterattacked by the Chinese army (Sherry p. 12). In a last-ditch attempt to cause as much havoc as possible, the Japanese released 6,000 prisoners infected with typhoid and paratyphoid back into Chinese territory (Carus p. 18; Yin pp. 160, 169). By late September, they had ceded back nearly the entire zone-of-occupation and left behind a trail of destruction (Xiong and Zhou p. 2250). As Chiang Kai-shek described in a telegram to Washington, "[t]he Japanese slaughtered every man, woman, and child in these areas—let me repeat, every man, woman, and child" (Scott, The Untold Story of the Vengeful Japanese Attack After the Doolittle Raid).

In retrospect, while the morale-lifting effects of the Doolittle raid in the US should not be disregarded, we should certainly place such benefits alongside its costs. We should realize that as a direct result of the raid, Japanese retaliation in cities like Quzhou and Nancheng was marked by countless atrocities against civilians. This serves as a stark reminder of the devastating human costs incurred.

The response of contemporaneous American news outlets, however, was relatively muted and vague. The New York Times reported, "At the moment the Japanese are concentrating the bulk of their offensive power against China… But it may have been General Doolittle's air raid that precipitated it" (The New York Times p. 92). The Los Angeles Times provided a comparatively more forceful, though ambiguous response, "To say that these slayings were motivated by cowardice as well as savagery is to say the obvious. The Nippon war lords have thus proved themselves to be made of the basest metal…" (Scott, *Target Tokyo: Jimmy Doolittle and the Raid That Avenged Pearl Harbor* p. 390). However, these news reports failed to leave a tangible impact in Western historiography and was relegated to the dustbin of history (The Untold Story of the Vengeful Japanese Attack After the Doolittle Raid). Even today, sources remain scant regarding the ramifications of the Doolittle raid, mostly focusing on the positive outcomes of the attack (Mitter; Meltzer and Mensch).

The Doolittle raid forces us to confront the duality of history and the moral ambiguity surrounding acts of war. As Walter Cronkite, the famous broadcast journalist, once said, "In seeking truth, you have to get both sides of a story" (Felling).

It's time we began to look at the other side of the Doolittle raid – its cruel and tragic reprisal.

Appendix

Figure 3.1: *Chinese Rescue Crashed Shangri-La Bombers.* April 18, 1942. Photo, 17.9 x 22.9 cm. https://www.gilderlehrman.org/collection/glc0955311

References

Alexandra Hospital Massacre. Accessed: 2024-06-22. https://www.nlb.gov.sg/main/article-detail?cmsuuid=7d4fd9a0-7bd0-4533-b0ea-3aa559673b0e.

Army Air Forces. General Doolittle's Report on Japanese Raid. July 1942. https://www.ibiblio.org/hyperwar/AAF/rep/Doolittle/Report.html#12.

Cannon, Martin, et al. *20th Century World History: IB Diploma Programme.* OUP Oxford, 2009.

Carter, James. The Complex Legacy of the Doolittle Raid and U.S.-China Allyship. Apr. 2023. https://thechinaproject.com/2023/04/19/the-complex-legacy-of-the-doolittle-raid-and-u-s-china-allyship/.

Carus, W. Seth. *A Short History of Biological Warfare: From Pre-History to the 21st Century.* Government Printing Office, 2017.

Chevrier, Marie Isabelle, et al. *The Implementation of Legally Binding Measures to Strengthen the Biological and Toxin Weapons Convention: Proceedings of the NATO Advanced Study Institute, Held in Budapest, Hungary, 2001.* Springer Science & Business Media, 2006.

Children of the Doolittle Raiders. History. Accessed: 2024-06-12. https://childrenofthedoolittleraiders.com/doolittle-raiders-history.

China Daily. Chinese Villagers Helped Save US Pilots during WWII. Aug. 2015. https://www.chinadaily.com.cn/world/2015victoryanniv/2015-08/12/content_21573741.htm.
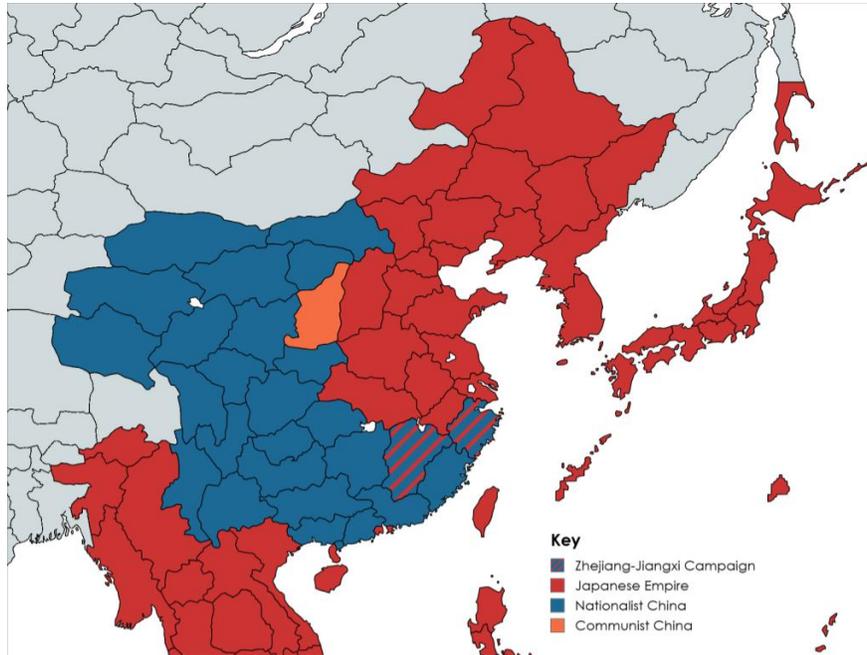
Figure 3.2: Map of areas occupied by the Imperial Japanese Army during the Zhejiang–Jiangxi campaign. (Map by author)

Figure 3.3: *Madame Chiang Kai-Shek (Song Meiling) with Members of the Doolittle Raiders (Left to Right) James Doolittle, John Hilger, and Richard Cole.* April 30, 1942. Photo. https://www.tshaonline.org/handbook/entries/hilger-john-allen-jack

Chinese Rescue Crashed Shangri-La Bombers. Apr. 1942. https://www.gilderlehrman.org/collection/glc0955311.

Chun, Clayton. *The Doolittle Raid 1942*. Osprey Publishing, 2006, http://archive.org/details/doolittleraid19400chun.

Correll, John. Doolittle's Raid. Apr. 2009. https://www.airandspaceforces.com/article/0409doolittle/.

Craven, Wesley Frank, and James Lea Cate, editors. *The Army Air Forces in World War II: Vol 1 - Plans and Early Operations; Jan 1939- Aug 1942*. University of Chicago Press, 1948.

Doolittle, James. GENERAL DOOLITTLE's REPORT ON JAPANESE RAID. Apr. 1942. https://www.ibiblio.org/hyperwar/AAF/rep/Doolittle/Report.html#12.

Doolittle, James, and Carroll Glines. *I Could Never Be so Lucky Again: An Autobiography*. Schiffer Military/Aviation History, 1995.

Doubek, James. The Flying Tigers: How a Group of Americans Ended up Fighting for China in WWII. Dec. 2021, History section. https://www.npr.org/2021/12/19/1062091832/flying-tigers-americans-china-world-war-ii-history-japan.

Feis, Herbert. *The Road to Pearl Harbor*. Princeton University Press, 1950, http://archive.org/details/roadtopearlharbo0000herb_n3s7.

Felling, Matthew. From The Vault: Cronkite & Hoffa. Sept. 2007. https://www.cbsnews.com/news/from-the-vault-cronkite-hoffa/.

Fischer, Howard. Atrocities in Asia: Japan's Infamous Unit 731. Jan. 2021. https://hekint.org/2021/01/07/atrocities-in-asia-japans-infamous-unit-731/.

Glines, Carroll V. *Doolittle's Tokyo Raiders*. First Edition, Van Nostrand, 1964.

Glines, Jr., Carroll V. *The Doolittle Raid*. Orion Books, 1988, http://archive.org/details/doolittleraidame00glin.

H-057-2: Operation Cherry Blossoms at Night. Accessed: 2024-06-18. http://public1.nhhcaws.local/about-us/leadership/director/directors-corner/h-grams/h-gram-057/h-057-2.html.

Hatano, Sumio. THE SINO-JAPANESE WAR AND THE PACIFIC WAR. 2011, Vol. 1, p. 194. https://www.mofa.go.jp/mofaj/files/100512970.pdf.

Hill, Amelia. The Day the Earth Died. Mar. 2003, From the Observer. https://www.theguardian.com/theobserver/2003/mar/02/features.magazine37.

Hotz, Robert. *Way Of A Fighter: The Memoirs Of Claire Lee Chennault*. Digitized copy, 1949, http://archive.org/details/in.ernet.dli.2015.506335.

Jung, Romeo. Unit 731: Imperial Japan's Biological and Chemical Warfare. Mar. 2018. https://dangerousworld.soe.ucsc.edu/2018/03/25/unit-731-imperial-japans-biological-and-chemical-warfare/.

Leng, Shumei. Why Doolittle Raid a Testimony of Enduring Friendship between Chinese and American People? Nov. 2023. https://www.globaltimes.cn/page/202311/1302384.shtml.

Liverpool, Edward Frederick Langley Russell Baron Russell of. *The Knights of Bushido: A History of Japanese War Crimes During World War II*. Skyhorse Publishing Inc., 2008.

Madame Chiang Kai-Shek (Song Meiling) with Members of the Doolittle Raiders (Left to Right) James Doolittle, John Hilger, and Richard Cole. Apr. 1942. https://www.tshaonline.org/handbook/entries/hilger-john-allen-jack.

Meltzer, Brad, and Josh Mensch. *The Nazi Conspiracy: The Secret Plot to Kill Churchill, Roosevelt and Stalin*. Bonnier Books UK, 2023.

Mitter, Rana. *Forgotten Ally: China's World War II, 1937–1945*. Houghton Mifflin Harcourt, 2013, http://archive.org/details/forgottenallychi0000mitt.

Molotov, Vyacheslav, et al. PACT OF NEUTRALITY BETWEEN UNION OF SOVIET SOCIALIST REPUBLICS AND JAPAN. Apr. 1941. https://avalon.law.yale.edu/wwii/s1.asp.

National Museum of the Pacific War. The Impact: China Incident War Medal. Accessed: 2024-06-04. https://www.pacificwarmuseum.org/visit/exhibits/artifacts/ciwm.

Nelson, Craig. *The First Heroes: The Extraordinary Story of the Doolittle Raid—America's First World War II Victory*. Penguin, 2003.

Office of the Historian. Japan, China, the United States and the Road to Pearl Harbor, 1937–41. 2013. https://history.state.gov/milestones/1937-1945/pearl-harbor.

———. Milestones in the History of U.S. Foreign Relations. 2013. https://history.state.gov/milestones/1937-1945/american-isolationism.

Orendain, Joan. February 1945: The Rape of Manila. Feb. 2014. https://globalnation.inquirer.net/99054/february-1945-the-rape-of-manila.

Pacific Atrocities Education. Human Experimentation at Unit 731. Accessed: 2024-06-16. https://www.pacificatrocities.org/human-experimentation.html.

———. The Bacteriological Warfare on China. Accessed: 2024-06-15. https://www.pacificatrocities.org/the-bacteriological-warfare-on-china.html.

PBS. Shiro Ishii. Accessed: 2024-06-15. https://www.pbs.org/wgbh/americanexperience/features/weapon-biography-shiro-ishii/.

Plante, Trevor. 'Two Japans.' Aug. 2016. https://www.archives.gov/publications/prologue/2001/summer/two-japans-1.

Rigg, Bryan Mark. *Japan's Holocaust: History of Imperial Japan's Mass Murder and Rape During World War II*. Simon / Schuster, 2024.

Rogers, J. David. Doolittle, Black Monday, and Innovation. n.d., p. 25.

Roosevelt, Franklin D. The Command Freezing Japanese Assets on July 25. Aug. 1941. https://www.jacar.archives.go.jp/das/image-en/B02030753200.

Schoppa, R. Keith. *In a Sea of Bitterness: Refugees during the Sino-Japanese War*. Harvard University Press, 2011.

Scott, James. *Target Tokyo: Jimmy Doolittle and the Raid That Avenged Pearl Harbor*. W. W. Norton & Company, 2015, http://archive.org/details/targettokyojimmy0000scot.

———. The Doolittle Raid Generated More Ripples than Once Thought. Apr. 2018. https://www.militarytimes.com/off-duty/military-culture/2018/04/18/the-doolittle-raid-generated-more-ripples-than-once-thought/.

———. The Untold Story of the Vengeful Japanese Attack After the Doolittle Raid. Apr. 2015. https://www.smithsonianmag.com/history/untold-story-vengeful-japanese-attack-doolittle-raid-180955001/.

Sherry, Mark D. *China Defensive*. Government Printing Office, 1996.

Snodgrass, Mary Ellen. *World Epidemics: A Cultural Chronology of Disease from Prehistory to the Era of Zika*. 2nd ed., McFarland, 2017.

Tanaka, Toshiyuki. *Hidden Horrors: Japanese War Crimes in World War II*. Westview Press, 1996, http://archive.org/details/hiddenhorrorsjap0000tana.

Tanaka, Yuki, et al. *Beyond Victor's Justice? The Tokyo War Crimes Trial Revisited*. BRILL, 2011.

Taylor, Jay. *The Generalissimo: Chiang Kai-Shek and the Struggle for Modern China, With a New Postscript*. Harvard University Press, 2009.

The Avalon Project. Soviet-Japanese Neutrality Pact April 13, 1941. 2009. https://avalon.law. yale.edu/wwii/s1.asp.

The Editors of Encyclopaedia Britannica. Doolittle Raid. Apr. 2024. https://www.britannica. com/event/Doolittle-Raid.

———. James H. Doolittle | World War II, Medal of Honor, Aviation Pioneer | Britannica. May 2024. https://www.britannica.com/biography/James-H-Doolittle.

———. Tripartite Pact | Definition, History, Significance, & Facts | Britannica. Sept. 2023. https://www.britannica.com/topic/Tripartite-Pact.

The Mary and Jeff Bell Library and Texas A&M University-Corpus Christi. Pearl Harbor: Japanese Military Motives. Accessed: 2024-06-05. https://www.tamucc.edu/library/exhibits/ s/hist4350/page/Pearl_Harbor_Japanese_Military_Motives.

The National WWII Museum. The Doolittle Raiders. July 2018. https://www.nationalww2museum. org/war/articles/doolittle-raiders.

———. The Pacific Strategy, 1941–1944. 2019. https://www.nationalww2museum.org/war/ articles/pacific-strategy-1941-1944.

The New York Times. "THE CHINESE CAMPAIGN". June 1942, Newspaper article (details not fully specified).

The Tokyo Raid. Oct. 1942. https://www.ibiblio.org/hyperwar/AAF/rep/Doolittle/Summary_ 20.html.

Tohmatsu, Haruo. "The Strategic Correlation between the Sino-Japanese and Pacific Wars". *The Battle for China*, Stanford University Press, 2010, pp. 423–45, https://doi.org/10.1515/ 9781503627338-030, https://doi.org/10.1515/9781503627338-030.

Tribe, Henry. Hilger, John Allen [Jack]. 2020. https://www.tshaonline.org/handbook/entries/ hilger-john-allen-jack.

United States Air Force. Doolittle Tokyo Raiders, Crew No. 14. Accessed: 2024-06-05. https: //www.af.mil/News/Photos/igphoto/2000561389/.

Walsh, Edward. 50 YEARS LATER, WORLD WAR II DOOLITTLE RAIDERS AND CHI-NESE RESCUERS MEET AGAIN. 1992, URL provided appears to be an archive page dated 1992-03-22 in the link. https://www.washingtonpost.com/archive/politics/1992/03/ 22/american-journal/457de4b7-67df-44a8-902e-9f1ed0ac3aee/.

Wang, Yuming, and Zhihui Che. *Grappling along Zhe-Gan Railway Line: 1942 A Complete Record of the Zhejiang-Jiangxi Campaign*. First Edition, The Great Wall press, 2015.

Wright, Quincy, and Carl J. Nelson. "American Attitudes Toward Japan and China, 1937–38". *The Public Opinion Quarterly*, vol. 3, no. 1, 1939, pp. 46–62.

Xiong, Wuyi, and Jiafa Zhou. *Great Dictionary: Military Volume*. Edited by Mingxin Zhou et al., Great Wall Publishing, 2000.

Yamamoto, Masahiro. *Nanking: Anatomy of an Atrocity*. Praeger, 2000.

Yin, James. *The Rape Of Biological Warfare*. Edited by Anna Fan et al., Northpole Light Publishing Hou, 2002.

York, Edward. Interview with Col. Edward J. York, 1984. June 1984. https://digital.utsa.edu/ digital/collection/p15125coll4/id/1250.

Zhao, Xu. A Lifetime of Suffering. July 2016. https://www.chinadaily.com.cn/a/201607/15/ WS5a2b874fa310eefe3e9a0eb2.html.

Zhuang, Pinghui. After the Air Raid: Across Generations, Second World War Ties That Bind. Dec. 2018. https://www.scmp.com/news/china/society/article/2178147/after-doolittle-raid-across-generations-second-world-war-ties.

Why One Child? How Mao, Scientism, and the West Shaped The One-Child Policy

Sam Cao

Miramonte High School

> The burgeoning population has outstripped economic expansion, overburdening the planet and becoming a crucial issue of social development, national and international political stability.
>
> Song Jian (Song et al., "Population System Control" p. 11)

4.1   Introduction

According to an ancient Chinese legend, the mother goddess, Nüwa, molded the first humans out of yellow clay. A symbol of creation, she nourished the birth of a new world, crafting nascent life with careful precision. Millennia later, the Chinese Communist Party (CCP) likewise assumed a God-like role, seeking to control the nature of humanity. However, instead of creating life, the CCP suppressed and extinguished life; and, in stark contrast to Nüwa's beneficent nature, the CCP was motivated by fear—fear of overpopulation, depleted resources, and the impact of a rapidly rising population on the country's modernization efforts. With the implementation of the one-child policy in 1980, the CCP began an undertaking that they hoped would produce an optimal demographic structure, safeguarding the country's economic destiny and elevating China's position on the international stage. However, a slew of indelible aftereffects followed this attempt at securing stability and prosperity. The CCP had unknowingly planted the seeds for a monumental population crisis.

By the mid-2000s, China was grappling with significant social and economic challenges stemming from its population policies: a shrinking workforce (White p. 356), skewed male-to-female sex ratio, and rapidly aging population. The decline in the working-age population had resulted in widespread labor shortages, significantly impacting businesses across the country (How Age-Old Prejudice Is Fuelling Worker Shortages in China's Factories). Meanwhile, the gender imbalance, with far more men than women (Wang et al. p. 117; Cameron et al.; Wei et al. pp. 169–186; Hodges), fueled social unrest, contributing to a rise in crime, inflated housing prices, and a marriage crisis where men struggled to find wives (Fong).

Simultaneously, China's rapidly aging population increasingly pressured younger generations, creating long-term financial and social strain (Jiang and Sánchez-Barricarte pp. 1429–1430). Through decades of coercive extensive abortions, sterilizations, and contraception campaigns, the one-child policy fundamentally altered Chinese demographics, enduringly curtailing people's aspirations of marriage and childbirth.

However, if the consequences of a one-child policy were so immense, why did the party uphold it for so long? More importantly, why did the one-child policy exist in the first place?

This paper seeks to answer these questions through an investigation of the historical context and multitude of influences that produced the policy. First, the immediate historical circumstances underlying Chinese birth planning in the 1970s and 80s will be described, with a focus on three aspects in particular: the People's Republic of China (PRC) under Mao's direction, the fear of a population crisis in the West, and the origins of scientism as an ideological force in China. Following this, a brief history of Chinese family planning is outlined. Family planning will first be traced to its genesis in the works of early philosophers, after which its presence in the 20th century during and beyond Mao's time in power will be clarified. Furthermore, the radicality of the one-child policy is explored, highlighting how it differs from the "longer (*wan*), later (*xi*), fewer (*shao*)" rule (LLF). Finally, this paper concludes with a comprehensive analysis of the causes and justifications of the one-child policy, bringing together the previously discussed topics within a cohesive framework.

Today, the one-child policy is commonly depicted as the calculated actions of an authoritarian government determined to retain power; in doing so, they stopped at nothing, not even people's bedrooms, to achieve their malicious goals. However, this is not the full story; more accurately, the one-child policy resulted from a wholesale rejection of the "ideological" following Mao's calamitous campaigns, an obstinate belief in Scientism, and the pervasive influence of the West both intellectually and financially.

4.2   Historical Circumstance

4.2.1   Mao's China

In the decades following its establishment, the PRC was transformed from a backwater, under-developed nation into one of the most prominent political and economic powers of the modern world. However, the PRC's first chair[pp. 1429–1430]man, Mao Zedong, contributed little to such a development—in fact, China was in a constant state of societal tension, chaos, and bloodshed under Mao, largely a result of the mass mobilization campaigns he conducted in order to indefinitely perpetuate the peasant revolution. Two campaigns are particularly relevant to the development of birth-planning policies in China: the Great Leap Forward (*a yuejin*) and the Cultural Revolution (*wenhua da geming*).

By the late 1950s, the collectivization of agriculture, which began almost immediately after the nation's founding, had been well under way with the Land Reform Movement (*tudi gaige*). To conduct a final collectivization program, Mao launched a comprehensive five-year plan, later known as the Great Leap Forward, leading to increased collectivization and labor-intensive industrialization. Hoping to increase productivity, the state entirely abolished private property, collectivizing it into communes (*gongshe*). Rather than transform China into a communist utopia, however, these reforms produced to the opposite. Factors such as inefficiency (Great Leap Forward) diminished manpower[1], the Four Pests Campaign[2], and natural disasters together

---

[1]The result of a diversion of labor toward the production of steel and iron without the proper, necessary industrial equipment. See Smil.

[2]The Four Pests Campaign was a campaign in which Mao order that the "four pests" – that is, rats, flies,

triggered one of the most devastating famines in human history—the Great Chinese Famine (Kung and Lin pp. 51–73; Lin and Yang pp. 125–140), or the "three-year great famine" (*san nian da jihuang*)—resulting in a death toll ranging from 15 million to 55 million (Remais; Chen pp. 13–25). During this period, grain production fell precipitously, leading to numerous occurances of cannibalism (Bernstein). As one might imagine, this had tremendous consequences for population growth. As Sinologist Susan Greenhalgh notes, the "ugly, lumpy" characteristic of an initial decline followed by a rebound in fertility exceeding pre-famine levels was later used as a justification for family planning policies as many "[appreciated] the importance of smoothing it out" (Greenhalgh pp. 113–114).

Less than a decade after the Great Leap Forward, Mao instigated the Cultural Revolution, aiming to rectify the CCP and re-instill a revolutionary spirit in the populace, especially the youth. As described by Historian Youqin Wang, the revolution mobilized students against their own teachers, accusing the latter of being "feudal, capitalist, and revisionist" (Wang pp. 6–32). As such, teachers were beaten, forced to injure each other, or forced to commit suicide (pp. 6–32). As a part of the effort to erase the counter-revolutionary past, traditional Chinese symbols, names, and artwork were destroyed, replaced with new "revolutionary" names and objects (Lu pp. 61–62); in Beijing alone, 475 roads were renamed to include the word "revolution" (Dutton p. 168). During this time, the chaos reigning throughout the country forced the government to largely cease its functionalities, leaving the state paralyzed in the face of an anarchic movement that was quickly getting out of hand (Greenhalgh). Seeing the unbridled turmoil and destruction, Mao finally called for an end to the violence in late 1968, although the Cultural Revolution persisted in a diminished state until his death (Phillips). It was the unrestrained chaos brought about by such events that helped develop an aversion to the "ideological" in both the minds of the people and those in power, paving the way for the rise of scientism in China.

Outside Mao's debilitating campaigns, China began to make progress on the international stage in the 1970s, gaining global acceptance and self-awareness after its period of self-imposed isolation, which had begun during the initial stages of the Great Leap Forward (Dreyer). On October 25, 1971, the PRC was admitted as a permanent member of the UN Security Council, replacing the seat's previous holder, the Republic of China (Taiwan) (U.N. Resolution 2758 (U.N. Voted to Admit Communist China, Expel Nationalist Delegates.)). This acceptance into the international community is especially pertinent to family planning, as gradually, the PRC began importing Western scientific methodology and literature (Minami pp. 74–82), including highly quantitative methods of demography (Greenhalgh pp. 132–134). In addition, China's integration into the global intellectual environment give China a novel lens to quantify its own scientific backwardness (p. 85); however, not only was Chinese science criticized, but China's economy and population were also scrutinized and compared to the far more industrialized nations such as France and the United States (pp. 111-113, 118–120). It was these concerns, made possible by a connection to the West, which were the key to the creation of a harsh and coercive family planning policy.

---

mosquitoes, and sparrows, to be exterminated as a form of "pest control", which would supposedly aid with agricultural output. For the effects of such a policy in relation to the Great Leap Forward and the Great Famine, see Rebecca Kreston, "Paved With Good Intentions: Mao Tse-Tung's 'Four Pests' Disaster," Discover Magazine, October 15, 2019, https://www.discovermagazine.com/health/paved-with-good-intentions-mao-tse-tungs-four-pests-disaster.

4.2.2 Malthusian Crisis

While China's economy was experiencing tremendous turbulence under Mao's political movements and collectivization efforts, Western nations were experiencing what became known as the "Golden Age of Capitalism." Skyrocketing productivity and an expansion of international trade created a surge of consumer demand, which, when combined with a seamless conversion of wartime industries to consumer industries, led to a so-called "baby boom" (United Nations; Moffatt; Easterlin). Soon, however, the exploding population became a cause for concern, and the problem of overpopulation—a so-called "Malthusian Crisis"—began to loom large in the eyes of the people. This mania was only compounded further by highly dramatized, pseudo-scientific works in the late 1960s and 70s, filled with colorful rhetoric describing the human race's inevitable doom at the hands of overpopulation (Desrochers and Hoffbauer p. 73).

It is important to note that concerns regarding overpopulation did not originate in the 1960s and 70s; rather, during the early 19th century, British economist Thomas Malthus was the first to discuss the potentially disastrous consequences of unchecked population growth. In his *Essay on the Principle of Population* (1798), Malthus proposed that while population growth followed a geometric trend, growth in food production followed a merely arithmetic trend (Malthus). Consequently, as population growth outpaced food production, societal order breaks down and chaos ensues. This imbalance between population and available resources would be the fundamental axiom upon which future Malthusian authors would produce their studies.

One of the most prominent works influenced by Malthus's principle was *The Population Bomb*, published in 1968 by Paul and Anne Ehrlich. The book became hugely successful owning to its apocalyptic rhetoric regarding the imminence of an environmental catastrophe, its authors advancing the claim that there are "[t]oo many people, packed into too-tight spaces, taking too much from the earth" (Mann). "The battle to feed all of humanity is over[,]" according to *The Population Bomb*, "In the 1970s and 1980s, hundreds of millions of people will starve to death in spite of any crash programs embarked upon now … We are today involved in the events leading to famine and ecocatastrophe; tomorrow we may be destroyed by them" (Ehrlich p. xi). Their extensive use of fatalist language is most evident when quantified. For example, in a section of just four pages they utilized over 25 instances of, as climate scientist Roger Revelle describes, "apocalyptic adverbs and adjectives".[3] Later in the early 1980s, it was exactly this type of oratory that was popularized in China and that convinced its leaders of the need for strict, coercive policies.

Four years after *The Population Bomb*, *Limits to Growth* (LTG) was published, co-authored by researchers at the Club of Rome (COR), an informal group of intellectuals and businessmen who discussed the world's most pressing issues (Masini; About Us). *LTG* was another work that has its origins in Malthus, though it adopts a more mathematical approach. Based on their simulation model World3, the COR scientists asserted that the global population would reach its maximum capacity in approximately a hundred years, and that continued population growth would surpass the planet's "limit to growth," leading to a catastrophic collapse of human society (Meadows et al. p. 23; Greenhalgh p. 132).

---

[3]They use the following words and phrases: "staggering, sobering, disaster (three times), enormously, drastically, catastrophic, dramatically, tremendous, highly lethal, extremely dangerous (twice), especially violent, more severe, extremely fortunate, extremely vulnerable, almost total, high potential, renewed spectre, not gruesome enough, colossal hazard, biological doomsday, superlethal, [and] disastrously effective." See Revelle pp. 66-70.

Concurrently, Western scientists were also authoring studies that saw the application of cybernetics in population control, more specifically, its potential as a means of preventing irreversible damage to the Earth's ecosystems. Often, their conclusions were quite radical. For example, the authors of *A Blueprint for Survival* (1972) recommended nearly halving the British population, reducing it from 56 million to 30 million (Goldsmith; Greenhalgh p. 133; Kwakernaak p. 359). Similarly, a Dutch study proposed an even steeper reduction, suggesting a decrease from 13.5 million to 5 million – a decrease of approximately 63% (Kwakernaak p. 359). However, though the impressive results obtained by these calculations were intended only as exploratory policymaking tools, they would provide the groundwork for justifying extensive population control after being imported into the PRC.

4.2.3   Scientism in China

In the early 1910s, a long-awaited period of modernization and transformation finally occurred in the newly formed Republic of China. Immediately after its establishment, a new generation of youth began eagerly advocating for the replacement of old cultural mores and preconceptions with modern Western social values. The glorification and reverence of science played a crucial role in this movement, as many saw science as the answer to China's obsolete Confucian ideals, which they believed were the root cause of the nation's weakness on the international stage (Lee pp. 76–78). Many young intellectuals believed that if China did not overcome its national weakness, it would be overtaken and destroyed by predatory, imperialist states (Uberoi p. 34). This Darwinian mindset also justified the displacement of traditional values with new, "scientifically" founded ones, a seemingly natural evolution to replace China's outmoded and inadequate ideas (Uberoi). These ideas were broadcast widely with the fiery language and confident assertions made by leading youth intellectuals of the time.

Central to the New Culture Movement's philosophy was the figure of "Mr. Science (*sai xiansheng*)," a personification of the Western scientific ideal that came to embody the movement's push for progress and enlightenment. Chen Duxiu, one of the most prominent members of the movement and founder of the radical journal *New Youth* (*xin qingnian*), proclaimed that "[w]e now believe that only these two Messrs. [Mr. Democracy and Mr. Science] can eliminate the darkness in China's politics, morality, learning, and thought" (Fan p. 280). While a steadfast belief in the capabilities of science was apparent in China at large, given Chen Duxiu's key role as one of the CCP's founders, it would continue to be especially prevalent in the Communist Party.

4.3   A History of Family Planning in China

4.3.1   Family Planning in Ancient China

China was, over its five-millennium long history, decidedly pro-natal, encouraging human reproduction and population growth. Traditional Confucianism emphasized the importance of a large family, declaring that it promoted happiness (Wang et al. p. 935); in fact, remaining celibate was unfilial. Mencius, a follower of Confucius, stated that "there are three things that are unfilial (*bu xiao you san*), and to have no posterity is the greatest of them (*hou wu wei da*)"

(Mencius) The *I Ching* (*yijing*), a core text of Confucianists doctrine, tells that "it is the great virtue of heaven and earth to bestow life" (Li, Natural Philosophy of I Ching and Life Practice). Moreover, since having more children increased the productivity of the family, the basic unit of production in ancient China, rulers commonly promoted pronatalist policies (Entwisle and Henderson p. 15; Wang et al. p. 933; The Great Proletarian Cultural Revolution in China, 1966-1976). While incentive structures such as state-subsidized midwifery and material benefits like foodstuffs, land, livestock, or labor exemptions regularly accompanied childbirth (Wang et al. pp. 931–934), authorities also employed disincentives. For example, if individuals did not marry at a certain age, the government would arranged marriages or imposed jail time (p. 933). Despite the primitive methods used by these states, their pronatalist policies were generally successful, as such ideas have persisted in rural areas into the modern day.

These examples also illustrate a crucial element that facilitated the one-child policy: robust state control. China's government, a historied bureaucratic formation, is an overpowering one (Hui pp. 168–223). Its bureaucracy is not only efficient, but also capable of mobilizing on a remarkably impressive scale; however, it is also persistently intrusive and dictatorial. It was precisely the statist nature of the Chinese government that allowed it to conduct ambitious, large-scale family planning programs.

4.3.2   Family Planning in 20th Cenutry China

Following the communist victory in the Chinese Civil War, Mao began implementation of his own population policies. While it is regularly claimed that Mao was an unwavering pronatalist (Jian; Fong and Wang; Jisen pp. 35–52), this generalization is inaccurate as his stance towards family planning can only be described as inconsistent and frequently contradictory. In the early 1950s, considering population growth a key driver of economic growth, birth control and contraceptives were condemned and banned by the state, respectively (Fitzpatrick). In 1945, however, the need for some form of family planning policy was realized after a census reported the population to be 530 million, much higher than what was previously assumed (Zhang et al. pp. 7–8). Thus, birth control was encouraged (Greenhalgh p. 53). Nevertheless, when the Great Leap Forward was launched in 1958, efforts were halted, only to briefly resume in the 1960s, when the State Council instated a Family Planning Commission, which initiated a supply of free contraceptives for couples of childbearing age (Qian pp. 8–13). In the latter parts of the decade, with the chaos of the Cultural Revolution breaking out around the nation, such efforts were again terminated (Greenhalgh p. 53). Mao made his last statement regarding population control in December 1974, noting in a report by the State Planning Commission, "Population must be controlled (*renkou fei kongzhi buxing*)" (Zhang et al. p. 54). This, in time, would set in motion the construction of a new field of Chinese demographic science—the science that would produce the one-child policy (Greenhalgh pp. 68–60).

Before population control could begin, however, such a notion was still difficult to justify politically; as per Maoist doctrine, Malthusianism was equivalent to capitalism. It was argued that since capitalism needed a "reserve army of the unemployed," a labor force "which [could] be employed at any time," overpopulation had been engineered as a means of oppressing the impoverished (Wang et al. p. 938). The dysfunctions Malthus described were in fact the consequences of societal inequality that could be solved with the socialist mode of production. Further, they claimed that imperialist powers used overpopulation to justify expansionism, an

especially pertinent example being the case of Imperial Japan.

Thus, before an adequate justification was produced, any study of demographics was forbidden, with those who attempted to create independent studies in the field suppressed and persecuted. Beginning in 1957, Mao launched his Hundred Flowers Movement, a seemingly benign, even welcomed campaign in which scholars and intellectuals were encouraged to voice opinions that challenged state policy (pp. 7–12). As Mao famously proclaimed, "[let] a hundred flowers bloom (*baihua qifang*) and a hundred schools of thought contend (*baijia zhengming*)[!]" Quickly, however, criticisms of the regime rose to a level deemed unacceptable, and central authorities subsequently launched the "Anti-Rightist Campaign (*fanyou yundong*)," superficially to remove rightist infiltrators of the CCP (Sha); in practice, it was implemented to silence political detractors (Vidal p. 3). One such affected person was Ma Yinchu, an economist and president of Beijing University (beida), who, in March 1957, published "New Population Theory," a paper that called for "strong measures" to prevent the rapid ballooning of China's population (Greenhalgh pp. 56–57). Despite his usage of Marxian instruments in justifying his proposal, he was swiftly denounced as being Malthusian in 1958, when Mao began supporting a more pro-natal approach towards family planning (p. 57). Thereafter, Ma was fired from his position at *beida*, becoming a political "nonperson" (Tien, "Demography in China: From Zero to Now" p. 687). Ma's fall from grace marked the beginning of a decade-long taboo surrounding population science that was only destigmatized by Premier Zhou Enlai in 1970.

4.3.3   "Longer, Later Fewer" & the One–Child Policy

In 1973, with the introduction of the LLF (*wan, xi, shao*) slogan at China's first official national birth conference, various restrictions on marriage and childbirth were implemented (Greenhalgh and Winckler p. 88). In urban areas, bridegrooms were required to be above 28, and brides above 25, to marry; in rural areas, it was 25 and 23 respectively (Bongaarts and Greenhalgh p. 586; Whyte et al. p. 149). Furthermore, couples were required to delay each child by at least four years (Bongaarts and Greenhalgh p. 149; Whyte et al. p. 149), and a limit of two children for urban couples and three for rural couples was introduced (Bongaarts and Greenhalgh p. 586). This number would eventually be reduced to two children, irrespective of urbanity. It was also during this period that political justification for population control was at last produced. In the preface to Engels' *Origin of the Family, Private Property, and the State* (1884), he describes a "twofold character" to production. On the one hand, one must contend with the production of the "means of existence," and on the other, the (re)production of humans (Engels pp. 71–72). Thus, since societal organization is determined by both types of production, only a "unified socialist plan," where both are regulated by the state, will be able to manage an optimal balance between the two (Greenhalgh p. 71).

By 1975, official statements regarding population began to circulate between the Central Committee and provincial governments, with birth planning often given primary focus on provincial agendas (Greenhalgh and Winckler p. 89). What marked a pivotal shift was the central government's move from focusing on the spacing of births to reducing the overall number of births. This transition culminated in the 1978 Fifth National People's Congress, where family planning became an official state matter and a "basic national policy" (Lin); in fact, an article was inserted into the Chinese constitution, declaring that "[t]he state advocates and encourages planned reproduction" (Tien, "Wan, Xi, Shao: How China Meets Its Population

Problem" p. 65). Alongside this, the national birth planning group was expanded, along with adopting a new slogan that reflected a revamped, more aggressive approach to controlling population.[4]

Towards the turn of the decade, the one-child policy began to take shape tangibly. Susan Greenhalgh traces this decisive "gestational" period (approximately between December 1979 and September 1980) of the soon-to-be policy by focusing on three phases of its formulation (Greenhalgh p. 198). First, a group of Chinese cyberneticists, experts in control theory, began pushing for the application of scientific methods to population management (pp. 211–223), gerrymandering the boundaries of population science to insert their own solutions to the problem (Greenhalgh p. 195; Gieryn pp. 1–35). Beginning in January 1980, the cyberneticists formed strategic alliances with high-ranking, influential politicians and scientists, investing their own proposals with substantial political force (Greenhalgh chap. 7). By April, the one-child policy emerged from the political arena as the unchallenged victor; in September, it was officially unveiled to the public in an open letter, signaling the beginning of a new era of Chinese family planning (pp. 298–299).

4.4   Radicality Defined

Having briefly illustrated a synopsized history of population control in China, this paper will now explore how the one-child policy was distinctly "radical" as compared to earlier measures. To highlight these differences, the LLF rule is compared with the one-child policy, with their temporal adjacency minimizing extraneous differences across comparisons. Thus, three distinguishing factors can be found between the two periods, demonstrating the radicality of the one-child policy: its overbearing limit of "one child,"[5] its "top-down" enforcement style, and its legitimized and extensive uses of coercive methodologies.

First, the one-child policy required reducing the fertility rate to one child per family, though there were regional variations, such as in rural regions or regions with ethnic minorities (Short and Zhai pp. 373–387). While during LLF, authorities placed a limit of two children in urban areas (Bongaarts and Greenhalgh p. 586), the one-child policy saw the number of families with two children reduced to 5.8% of the population (Xinhua News Agency). In the same census, the percentage of one child and one-and-a-half child families (families allowed more than one child, especially if the first child was female or disabled) was 37.5% and 52.8% of the total population, respectively (Xinhua News Agency). Despite the existence of families with two or more children, such cases were the exception, not the norm.

Second, the one-child policy employed a "top-down," statist method of policy enforcement. While health officials and "moderate development-minded leaders" cooperated to construct LLF, ensuring that it reflected "popular interest" (Greenhalgh p. 66), the one-child policy

---

[4]"[P]arty secretary in command (*shuji guashuai*), whole party acts (*quandang dongshou*), propaganda and education (*xuanchuan jiaoyu*), models show the way (*dianxing yinlu*), strengthen scientific research (*jiaqiang keyan*), improve [medical] technique (*tigao jishu*), implement measures (*cuoshi luoshi*), mass movements (*qunzong yundong*), persevere (*zhizhi yiheng*)." See Greenhalgh and Winckler.

[5]It should be noted that while there was no uniform "one-child policy," with differing strengths of enforcements and a multitude of exceptions across the nation, such was only the case due to circumstances beyond the control of the central government. This will be discussed in the following paragraph.

consisted largely of centrally devised and disseminated population quotas. These quotas were often highly unrealistic, forcing local cadres to employ coercive measures to avoid penalties (Li, License To Coerce: Violence Against Women, State Responsibility, and Legal Failures in China's Family-Planning Program pp. 155, 164). Taking advantage of the Chinese state's immense power and acting in opposition to Mao's "mass line" doctrine of enforcing political agendas[6], the one-child policy blatantly overruled the people's concerns. In fact, authorities regularly performed family planning actions despite violent resistance in the countryside, with the state "quietly accepting" the use of force as a means of policy enforcement (Greenhalgh p. 166). Furthermore, the political momentum built up around the bloated family planning apparatus was a key factor in the continuation of the one-child policy, making the termination of such an institution difficult (Feng et al., "Population, Policy, and Politics: How Will History Judge China's One-Child Policy?" p. 126). Undoubtedly, the obstinate nature of a "top-down" administrative method and the convoluted central birth-planning apparatus driving the policy contributed to its invasiveness and duration.

Third, the one-child policy legitimized and even sanctioned discriminatory and coercive practices. Although the LLF rule saw the initially implementation of many violent enforcement mechanisms, these measures were only popularized during the one-child policy (Whyte et al. pp. 150–151). It was the one-child policy's stricter criteria and overbearing governmental pressure that led to the widespread acceptance and application of coercion (Li, License To Coerce: Violence Against Women, State Responsibility, and Legal Failures in China's Family-Planning Program). For instance, besides depriving out-of-plan children of household registration (*hukou*)[7], during the one-child policy, even the subsidies provided to the family's previous children were forcefully "returned" to the state (p. 157–158). Furthermore, there were also exceptionally hefty fines, up to around 30 to 50% of the median income in some areas, and usually over 50 times the subsidies offered for having only one child. We also find discrimination towards women and female children. Despite the recent invention of the no-scalp vasectomy, a far safer and more convenient measure compared to female sterilization, vasectomy rates were far below those of their female counterparts (Gonzales et al. p. 2). Moreover, no action was undertaken to address the perception that male children were more valuable than female children; in 1980, five percent of female babies "disappeared" from official records, presumably a victim of abandonment or infanticide, a phenomenon all too common (Li, License To Coerce: Violence Against Women, State Responsibility, and Legal Failures in China's Family-Planning Program pp. 159–160). In its most intense year, 1983, the one-child policy saw 14.4 million abortions, 20.7 million female sterilizations, and 17.8 million IUD insertions, the vast majority of patients being involuntary ones (Whyte et al. p. 154). As evidenced, the one-child policy not only enforced strict limitations on family size, but also perpetuated harmful gender biases and practices.

---

[6]"Mass line" refers to a Maoist methodology for implementing policies, where an initial policy is formulated, revised based on testing, and retested. See Steiner, H. Arthur. "Current 'Mass Line' Tactics in Communist China." American Political Science Review 45, no. 2 (June 1951): 422–436.

[7]An essential component in receiving government subsidized education, having access to public transportation, getting married, opening a bank account, among other things. See Wang, Zhihe, Ming Yang, Jiaming Zhang, and Jiang Chang. "Ending an Era of Population Control in China: Was the One-Child Policy Ever Needed?" The American Journal of Economics and Sociology 75, no. 4 (2016): 929–979. Accessed June 19, 2024. https://www.jstor.org/stable/45129326.

Finally, it should be noted that despite LLF's comparatively lax policy enforcement mechanisms and family planning obligations, it was far more effective at reducing fertility while avoiding adverse socioeconomic consequences. During LLF, China's fertility rate saw a decrease of roughly 0.3 per year, while the sex ratio during this period remained stable (Fang and Chen). On the other hand, the one-child policy from 1980 to 2016 saw China's fertility decrease by merely 0.025 per year (Huang and Silver), while the sex ratio rose to around 120 males per 100 females born, only dropping to relatively mundane levels post-2010. Surprisingly, the one-child policy was less effective and more destructive than its predecessor.

4.5   Radicality Explained

To begin investigating the one-child policy, understanding Deng Xiaoping, especially his political restructuring, is essential. After Mao's death, a brief power struggle unfolded between Hua Guofeng, the de facto leader and supporter of Mao's policies, and Deng Xiaoping. Eventually, Deng successfully outmaneuvered Hua, becoming China's paramount leader by 1980. In a bid to reinforce party legitimacy, Deng employed several political tactics that helped promote the new regime as being "pragmatic-not-dogmatic" and based on "facts-not-ideology" (Greenhalgh p. 97). This approach is best exemplified by two of Deng's slogans: "crossing the river by feeling the stones (*mozhe shitou guohe*)," and "seeking truths from facts (*shishi qiushi*)." Such slogans underscored the difference between Mao, whose political actions were "ideological" and "utopian," and Deng, whose approach was methodical and pragmatic (p. 97). Indeed, the ideological difference between Dengist and Maoist went far beyond the merely rhetorical, as many of Deng's actual policies reflected a scientist perspective on governance.

4.5.1   Deng's New China

One particularly relevant example of Deng's political stance was his "Four Modernizations (emphsige xiandaihua)," introduced in 1978 with the goal of strengthening China's agriculture, industry, defense, and science and technology (S&T). Deng wanted to create a *xiaokang shehui*, or a "modern socialist country that is prosperous, strong, democratic, culturally advanced, harmonious, and beautiful (Li, Communique of the Third Plenary Session of the 11th Central Committee of the Communist Party of China; Understanding the Two Sessions: What Is Xiaokang?)." Though the Four Modernizations were unofficially announced by Zhou Enlai in 1963 (在上海市举行的科学技术工作会议上 周总理阐述科学技术现代化的重大意义), the political turbulence caused by Mao's various political campaigns prevented it from being realized. Despite this, Zhou, one of the most popular leaders in the CCP, supported the Four Modernizations throughout his life, imbuing the proposal with significant political gravitas. Deng would be the one to finally put the plan into action, advocating for the four modernizations as one of the core tenants of his agenda to modernize China, especially focusing on S&T (Greenhalgh p. 94). Later, birth planning was proposed as to negate the effects of China's enormous population in their bid to realize the four modernizations.

Another example of Deng's revisionist thinking is found in his theory of "socialism with Chinese characteristics (*zhongguo tese shehuizhuyi*)," which saw the partial adoption of free-market economics in China to promote economic growth. It was argued that only by first adopting

such measures, would the emergence of a Marxist communist society become conceivable (Deng Xiaoping: Let Part of People Get Rich First). To quantify these proposals for economic growth, Deng stated that his economic reforms would allow China to achieve a per capita output of $1,000 by the turn of the century – more than quadruple per capita output in 1980. Compared to Mao's vague, abstract expressions, Deng's scientistic and utilitarian approach towards realizing a socialist state imbued his regime with inherent authority and legitimacy; scientism would come to infiltrate all aspects of governmental decision-making, ultimately allowing for the creation of the one-child policy.

4.5.2   Scientism in Politics

Why was the influence of scientism so prominent in Chinese politics? Two causes can be identified: first, under Mao, the natural sciences were granted significant political influence. Second, the natural sciences were able to sway top CCP officials with complex, often incomprehensible, mathematical models and procedures.

During Mao's time in power, he invested significantly in defense science, allocating substantial amounts of developmental resources for their research. As such, defense science enjoyed access to "foreign literature, … data, and … [electronic] computers (Greenhalgh p. 139);" accordingly, many top officials began to view their work as being more credible and "scientific" than the work of social scientists, who were barred from enjoying similar advantages. Even after Mao's death, a preference for the natural sciences remained. Whereas the natural scientists were no longer constrained by party politics, oriented by "the reasoning of modern science and mathematics" alone, social scientists were used as a tool by politicians to "empirically illustrate" problems and "articulate" solutions in the debilitating framework of Maoist-Leninist thought (p. 84).

A germane example of the CCP's favorability towards the natural sciences was, to borrow terminology from Susan Greenhalgh, the "Song group" (Greenhalgh), a group of cyberneticists led by Song Jian, a leading rocket scientist. Through Mao's goodwill, Song acquired extensive political connections and access to population data unavailable to social scientists; they received endorsements from top officials and scientists who brandished enormous political influence (p. 140). Among these could be found Qian Xuesen and Xu Dixin, father of the Chinese space program and head of the Population Association of China respectively (p. 243). As previously mentioned, scientism had existed in China since the beginning of the 18th century; their early influence on the nascent Communist Party of the 1920s and 30s almost certainly contributed to this reverence of the natural sciences, which influenced the CCP during and beyond Mao's time. Song's political dominance will play a crucial role in constituting the one-child policy.

Similarly, in their formulation of the population problem, Song relied heavily on complex mathematics, which many could not understand. Officials accepted Song's findings entirely because they "used control theory [(cybernetics)]," or that "the mathematics and equations were impressive." One individual even rather egotistically acknowledged that the calculations seemed credible as "he himself could not do them" (p. 246). As only Song had the means to interpret their own models, they received recognition and credibility as the "guardian[s]" of their work (Caiden and Wildavsky p. 294). Such blind acquiescence towards the natural sciences not only permitted Song to have substantial sway over policy decisions, but also cemented the future prevalence of scientism in policymaking. Song repeatedly underlined the scientific rigor

and objective nature of his work, in one case, even adding arbitrary decimals to demonstrate the exactitude with which his calculations were apparently conducted (Greenhalgh p. 218). "[T]here are still quite many intellectuals who," as he commented in a paper, "starting off with [biased] sentiment, go so far as to challenge the irrefutable logic of [the] natural sciences" [emphasis added] (Song). Such use of rhetoric and display of mathematical prowess would be key in establishing ethos for claims made by the cyberneticists.

Concurrently, while many touted the cyberneticists' works as irrefutable, the work of social scientists was perceived as being uninformed and unsophisticated. In lieu of the cyberneticists' computer-generated graphs and figures, social scientists had only "crude," hand drawn ones that were hardly comparable (Greenhalgh p. 209). Furthermore, social scientists generally pushed for demographic policies that were far more moderate, making them seem "unoriginal," "too ideological," and not scientific enough compared to the cyberneticists (p. 260).

4.5.3   Scientistic Methodology

We can now articulate four key aspects of Song's approach to population science: first, they reframed the population crisis as an environmental issue; second, they drew heavily on methodological principles from rocket science; third, they often relied on incomplete and unreliable data; and fourth, they overlooked the potential social repercussions of their policy.

First, Song re-conceptualized the population crisis as not merely a national concern, but a *global, environmental* one. In essence, they argued that China's population growth was not only a threat to national security and survival (p. 153), but that it was an existential and all-encompassing threat to the entirety of "human survival." Not only did they argue China could not realize its four modernizations or achieve a *xiaokang* society if population growth was to continue, but also that China's role in engendering this looming demographic and ecological crisis would severely damage the nation's international reputation (p. 154). In a manner analogous to their Western counterparts, Song painted images of environmental devastation, portraying unmitigated population growth as the Earth's foremost killer. To demonstrate the imperativeness of the population crisis, Song conspicuously borrows the clichéd Western metaphor of Earth as a spaceship, how even the vast cosmos offers no recourse (Greenhalgh p. 149; Ehrlich p. 21). Thus, they framed the one-child policy as the "only solution" to keep China's population below 1.2 billion, which they calculated to be the limit beyond which Deng's previously mentioned economic objectives would become unattainable, and beyond which the environmental damage would be enormous and irreversible (Greenhalgh pp. 158, 240).

Second, Song advocated for the central government to draft a strong, unidirectional policy that the various provincial administrations would further disseminate down the hierarchy. Upon such a structure, each administration would develop and implement a unique birth control plan modified with regional constraints in mind (Song et al., *Population Control in China: Theory and Applications* pp. 29–32). Thus, regional authorities would remain adhered to the central formulation despite regional variations in enforcement strength and punishment. Influenced by his work in the defense industry, Song's proposal was entirely "top down," rejecting the responsive nature of LLF, even quietly accepting the use of coercion "in the interest of achieving greater goals" (Greenhalgh p. 166). The complex and mathematical nature of Song's models necessitate that policies originate from a central government to its citizens, resulting in a

"programmatic" approach to policy implementation and enforcement (Arthur and McNicoll p. 262). Evidently, the forceful and unresponsive nature of the one-child policy made it highly coercive.

Third, Song relied heavily on spotty statistics, resulting in inaccurate conclusions. Although China had a robust system of census collection during the 50s and 60s, the Great Leap Forward had caused a collapse in census infrastructure, preventing accurate population data from being gathered (Banister chap. 2). As such, no demographic data were collected in the 1970s (Greenhalgh p. 62). One member of Song described there as being "no [good] input data (*meiyou shuju*)," and that though the data was "difficult (*kunnan*)," they were "workable (*kao de zhu*)" (p. 161). In one case, they conducted calculations under the assumption that Chinese protein intake matched that of the West, despite China's agricultural sector being far too underdeveloped to facilitate such consumption (p. 159). Despite the lack of reliable data as the basis for drawing conclusions (much less informing policy), Song nonetheless conducted ostensibly precise calculations while being forced to make "countless heroic assumptions" regarding their data (Greenhalgh). Perhaps most alarmingly, numerous concerns regarding potential defects in the data were all but dropped by the time conclusions were formulated. Song merely presented their findings as infallible (pp. 161, 217), while government authorities censored any complaints regarding the accuracy of the data (pp. 257–259). It was this combination of erroneous calculations and political invulnerability that eventually birthed the one-child policy.

Lastly, Song ignored the social consequences of a one-child policy. In an article published in the People's Daily, Song and his colleagues claimed that "we [China] cannot run into these problems in this century, and in the first twenty years of the twenty-first century they will not be serious" (p. 248). Not only did they argue that social consequences were of no major concern, they further claimed that were one to take such concerns into account, any attempt at birth control would be impossible. As Song stated in a paper, "If social customs and psychological conditions are considered, $\beta(t)$ [the Total Fertility Rate] can hardly go below a level acceptable to the public" (Song et al., *Population Control in China: Theory and Applications* p. 251). Much like his recommendation of a "top down" enforcement solution, Song's ignorance of social consequences can again be attributed to his work in the defense industry. Under such circumstances, as one might imagine, social consequences were seldom considered (Greenhalgh p. 153). Further, despite Song's ability to mathematically calculate the population trajectory, they did not have the analytical tools and empirical data to grasp the gravity of resulting social consequences, allowing the cyberneticists to merely write off such abstract concerns raised by social scientists as being mere speculation (p. 286). Moreover, due to the manner in which Song had presented the population crisis, regarding it as an impending, global, and existential environmental threat, the one-child policy was portrayed as the price that had to be paid in order to save not only China, but the world, from "impoverishment and extinction" (p. 287). As Song emphasized: "At least before the end of this century, we must stick to the policy of one child per couple, so that the people of the 21st century will be able to enjoy family happiness" (Song p. 4).

4.5.4   The West in China

In 1978, Song travelled to Helsinki to participate in the Seventh Triennial World Congress of the International Federation of Automatic Control. During his travels, he encountered

Western cyberneticists, some of whom were experimenting with applying control theory to demography (Bacaër p. 142). Finding this idea appealing (Greenhalgh p. 144), Song came to borrow many originally Western conceptualizations of the population crisis: an emphasis on the environmental impacts of overpopulation, the aforementioned analogy of Earth as a spaceship, the formulation of overpopulation as a transnational issue, and many others. Additionally, they imitated Western tactics of manipulating empirical data to underscore the scale of the crisis. For one such case, they illustrated rapid population growth by showing population increases over progressively shorter time intervals (Goldsmith pp. 6–7). They also defined an "optimal population" based on the environment's carrying capacity, arguing that unregulated growth would exceed this limit (pp. 46–47). However, Song not only borrowed the Western construct of overpopulation; he combined fearmongering language from Western works such as *The Population Bomb* with the obdurate belief in "scientism" present in the CCP to produce new rhetorical apparatuses.

Susan Greenhalgh identifies three main rhetorical tools Song used: *quantification*, *categorization*, and *comparison*. First, Song reformulated textual reports into numerical reports, stripping them of their original context. Through a process Greenhalgh terms "faerification," empirical statements were reborn as "facts" and categorical truths, truths independent of circumstance (Greenhalgh p. 109; Latour p. 23). This fell in line with Deng's doctrine of "seek truth from facts," allowing their calculations to be easily politicized, and to be seen as having originated from pure mathematical logic, untainted by political machinations. Second, they created visual representations of data, harnessing "ocular power" to present information in an easily digestible manner. In doing so, they invented a "new demographic and political reality" through their graphs, compacting their intricate computations into a universally accessible form (Greenhalgh p. 110); this, as previously mentioned, also allowed them to manipulate the data in ways that supported their conclusions. Third, they highlighted China's apparent deficiencies through comparisons with the West, portraying China as a backwater nation that *should* have been able to compete with the West but was hopelessly outmatched due to its unwieldy population. Using these three devices, Song "revealed" overpopulation as the root cause of China's ills.

It should be noted that despite Song's diligent borrowing from the West, there remain aspects of Western methodology that were not adopted. One such difference was that when Western scientists argued for a reduction in fertility, they typically imagined such a process to occur over an extended period of at least several decades. For instance, while Dutch scientists proposed that a 40% reduction in fertility transpire over the course of 40 years (Kwakernaak p. 365), Song proposed that Chinese fertility be reduced by 50% in merely *five* (Greenhalgh p. 163). Unlike the Song group, towards whom criticisms were either ignored, disregarded, or outright forbidden due to their lack of political capital, Western literature regularly received public criticism. For example, The Population Bomb was cast as fearmongering and unscientific (Revelle pp. 66–70), and the LTG, methodologically lacking and scientifically inaccurate (Nordhaus pp. 1182–1183). All things considered, the most prominent and unanimous concern of various scholars was that any conclusions reached through long-term demographic projections are highly contingent on uncontrolled factors; that such deductions are at best half-truths, if not outright misleading and fallacious statements (Nordhaus p. 1183; Sanderson p. 52; Cole et al. p. 133). As evidence, while Western natural scientists had checks and balances all the while controlling little practical political influence, Chinese natural scientists practically dictated state policy.

Aside from influencing China in a purely intellectual sense, Western international organiza-

tions also offered financial incentives in support of Chinese birth control programs. According to the Chinese Embassy in Norway, by 1999, the "UNFPA [United Nations Fund for Population Activities] had provided US$177 million of assistance and carried out 123 projects in China" (Wang et al. pp. 953–954) These funds contributed financially to the continuation of the one-child policy, representing an international endorsement of Chinese family planning efforts (Yi p. 102). In 1983, the UN Secretary-General even awarded Qian Xinzhong, the minister of family planning, with the United Nations Population Award, apparently impressed by how the Chinese government had "marshaled the resources necessary to implement population policies on a massive scale" ("United Nations Population Award to Indira Gandhi and Qian Xinzhong"). Private foundations also contributed significantly to birth control efforts. For example, the Rockefeller Foundation provided financial support for birth control programs, supplied free condoms, and initiated efforts for China to begin domestic production of birth control pills (Chung p. 119; Wang et al. p. 954). Even the US government supported the policy, though only indirectly. From 1965 to 2004, $17.3 billion was invested into the UNFPA under a directive known as NSSM-200, commonly known as the "Kissinger Report" (Clowes p. 27), through which a substantial portion of the funds were funneled to China (Wang et al. p. 956).

The motivations of these Western sponsors varied widely. While in the case of the UNFPA, their support of the one-child policy seems to have been a by-product of their effort to increase access to birth control worldwide, the Rockefeller Foundation had the explicit agenda of solving overpopulation, with Rockefeller himself describing population growth as "an outstanding problem" (p. 954). Even more malicious was NSSM-200, which sought to continue the extraction of mineral resources from third-world nations; in fact, the document itself suggests that US aid should only be conducted through international non-governmental organizations as to avoid charges of "economic or racial imperialism" (Grimes p. 382–383). As illustrated here, Western involvement in the formulation and preservation of the one-child policy went far beyond the merely intellectual, as both direct financial assistance and indirect political legitimization played a part.

4.6   Conclusion

What price is worth paying for survival? In 1980, China's answer to this question was the one-child policy. On September 25th, an open letter was addressed to the members of the Communist Party and the Youth League. Although the letter itself was less than two thousand characters long, and had been formulated in a matter of months, it would come to inform Chinese thinking for the next 40 years. Inevitably, the confluence of Mao's disastrous campaigns, Western fears regarding overpopulation, and Scientism's entrenched nature in Chinese intellectual culture produced the one-child policy. Like a vast dam attempting to hold back a powerful river, China's one-child policy was an attempt to control the uncontrollable – the very flow of life itself. However, the policy was by no means adopted out of any semblance of convenience; instead, it was framed as China's final recourse, "deemed a 'solution when there was no solution' (*meiyou banfa de banfa*)," an ultimate measure implemented when all other option had failed (Greenhalgh p. 287).

Ultimately, the one-child policy is best seen as the result of a tyrannical government asserting its control over its citizens, exacerbated by a series of scientific missteps and pervasive Western

influence. The one-child policy illustrates the power of "science" in shaping policymaking, even when unjustified, and underscores the significant errors that unchecked government authority can produce (p. 343). Science, blindly accepted, is akin to gospel in today's world; globalization has advanced tenfold since the inception of the policy; authoritarianism still reigns in a myriad of regions throughout the world. The one-child policy will be remembered as one of the most radical social experiments in recent history, a uniquely modern intersection of science and politics. It is a policy that formed a pillar of China's national identity for more than three decades, shaping the trajectory of its society, economy, and culture. As historians look back upon this era, they perceive a nation wrestling with immense challenges – both those of its history and those it unknowingly created for its future. Only time will tell if China chooses to rewrite its story or remain bound by the past. The one-child policy may have been uniquely Chinese, but the lesson learned is universally applicable; we cannot reduce demographics to mere mathematics, as the cost of ignoring the human element is far too high.

References

About Us. Accessed: 2024-07-16. https://www.cluboffrome.org/about-us/.

Arthur, W. Brian, and Geoffrey McNicoll. "Large-Scale Simulation Models in Population and Development: What Use to Planners?" *Population and Development Review*, vol. 1, no. 2, 1975, pp. 251–65.

Bacaër, Nicolas. *A Short History of Mathematical Population Dynamics*. Accessed: 2024-08-15, Springer Verlag, 2011, https://public.ebookcentral.proquest.com/choice/publicfullrecord.aspx?p=5555115.

Banister, Judith. *China's Changing Population*. Stanford University Press, 1987.

Bernstein, Richard. "Horror of a Hidden Chinese Famine". *The New York Times*, Feb. 1997, Books section. Accessed: 2024-09-19. https://www.nytimes.com/1997/02/05/books/horror-of-a-hidden-chinese-famine.html.

Bongaarts, John, and Susan Greenhalgh. "An Alternative to the One-Child Policy in China". *Population and Development Review*, vol. 11, no. 4, 1985, Accessed: 2024-06-10, pp. 585–617. https://www.jstor.org/stable/1973456.

Caiden, Naomi, and Aaron B. Wildavsky. *Planning and Budgeting in Poor Countries*. Transaction Books, 1980.

Cameron, Lisa, et al. China's One-Child Policy: Effects on the Sex Ratio and Crime. 2018, Last modified: 2018-09-10. Accessed: 2024-09-14. https://ifstudies.org/blog/chinas-one-child-policy-effects-on-the-sex-ratio-and-crime.

Chen, Yixin. "The Study of China's Great Leap Forward Famine in the West". Vol. 17, no. 1, 2015, pp. 13–25. https://web.archive.org/web/20210517052743/http://ww2.usc.cuhk.edu.hk/PaperCollection/webmanager/wkfiles/2012/201503_38_paper.pdf.

Chung, Yuehtsen Juliette. *Struggle for National Survival: Eugenics in Sino-Japanese Contexts, 1896-1945*. Psychology Press, 2002.

Clowes, Brian. Kissinger Report. 2004, Accessed: 2024-08-16. https://www.academia.edu/56022473/Kissinger_Report.

Cole, H. S. D., et al., editors. *Models of Doom: A Critique of The Limits to Growth*. Universe Books, 1973.

Deng Xiaoping: Let Part of People Get Rich First. 2021, Last modified: 2021-07-29. Accessed: 2024-08-12. https://web.archive.org/web/20210729211603/http://www.fengqi.sh.cn/en/news/knowledge9.html.

Desrochers, Pierre, and Christine Hoffbauer. "The Post War Intellectual Roots of the Population Bomb: Fairfield Osborn's "Our Plundered Planet" and William Vogt's "Road to Survival" in Retrospect". *The Electronic Journal of Sustainable Development*, vol. 1, no. 3, 2009, Accessed: 2024-07-09, p. 73. https://geog.utm.utoronto.ca/desrochers/wp-content/uploads/2020/06/The_Population_Bomb.pdf#page=79.

Dong, XinQi. "Elder Rights in China". *JAMA Internal Medicine*, vol. 176, no. 10, Oct. 2016, Accessed: 2024-08-03, pp. 1429–30. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7422934/.

Dreyer, June T. Chinese Foreign Policy. 2007, Last modified: 2007-02-12. Accessed: 2024-07-15. https://www.fpri.org/article/2007/02/chinese-foreign-policy/.

Dutton, Michael Robert. *Streetlife China*. Cambridge University Press, 1998.

Easterlin, Richard A. *Birth and Fortune: The Impact of Numbers on Personal Welfare*. Accessed: 2024-07-16, University of Chicago Press, 1987, https://press.uchicago.edu/ucp/books/book/chicago/B/bo3633710.html.

Ehrlich, Paul R. *The Population Bomb*. Ballantine Books, 1971.

Engels, Friedrich. *The Origin of the Family, Private Property, and the State*. First Edition, International Publishers Co, 1972.

Entwisle, Barbara, and Gail Henderson. *Re-Drawing Boundaries: Work, Households, and Gender in China*. University of California Press, 2000.

Fan, Fa-ti. ""Mr. Science", May Fourth, and the Global History of Science". *East Asian Science, Technology and Society: An International Journal*, vol. 16, no. 3, July 2022, Accessed: 2024-07-18, pp. 279–304. https://doi.org/10.1080/18752160.2022.2095099.

Fang, Hanming, and Yi Chen. How Family Planning Policies Reshape the Life of the Chinese Elderly. 2018, Last modified: 2018-10-03. Accessed: 2024-06-18. https://cepr.org/voxeu/columns/how-family-planning-policies-reshape-life-chinese-elderly.

Feng, Wang, et al. "Population, Policy, and Politics: How Will History Judge China's One-Child Policy?" *Population and Development Review*, vol. 38, 2013, Accessed: 2024-06-09, pp. 115–29. https://www.jstor.org/stable/23655290.

Feng, Wang, et al. "The End of China's One-Child Policy". *Studies in Family Planning*, vol. 47, no. 1, 2016, Accessed: 2024-06-11, pp. 83–86. https://www.jstor.org/stable/24720399.

Fitzpatrick, Laura. China's One-Child Policy. 2009, Last modified: 2009-07-27. Accessed: 2024-06-18. https://time.com/archive/6947470/chinas-one-child-policy/.

Fong, Mei. *One Child: The Story of China's Most Radical Experiment*. Houghton Mifflin Harcourt, 2016.

Fong, Mei, and Yaqiu Wang. How to Fix China's Population Crisis: Say Sorry to Women. 2022, Last modified: 2022-07-05. Accessed: 2024-06-19. https://www.hrw.org/news/2022/07/05/how-fix-chinas-population-crisis-say-sorry-women.

Gieryn, Thomas F. *Cultural Boundaries of Science: Credibility on the Line*. University of Chicago Press, 1999.

Goldsmith, Edward. *A Blueprint for Survival*. Penguin, 1972.

Gonzales, B., et al. No-Scalpel Vasectomy: An Illustrated Guide for Surgeons. 1992, Accessed: 2024-08-02. https://www.semanticscholar.org/paper/No-scalpel-vasectomy%3A-an-illustrated-guide-for-Gonzales-Marston-ainley/749bb57fcd42ccdae0b48bb31101cf3e528b8088.

Great Leap Forward. 2024, Published: 2024-02-26. Accessed: 2024-07-13. https://www.britannica.com/event/Great-Leap-Forward.

Greenhalgh, Susan. *Just One Child: Science and Policy in Deng's China*. University of California Press, 2008.

Greenhalgh, Susan, and Edwin A. Winckler. *Governing China's Population: From Leninist to Neoliberal Biopolitics*. Stanford University Press, 2005.

Grimes, Seamus. "From Population Control to 'Reproductive Rights': Ideological Influences in Population Policy". *Third World Quarterly*, vol. 19, no. 3, Sept. 1998, Accessed: 2024-10-30, pp. 375–94. https://doi.org/10.1080/01436599814307.

Hodges, Paul. China's Housing Market Moves from Boom to Bust. 2024, Published: 2024-05-19. Accessed: 2024-09-14. https://www.icis.com/chemicals-and-the-economy/2024/05/chinas-housing-market-moves-from-boom-to-bust/.

How Age-Old Prejudice Is Fuelling Worker Shortages in China's Factories. 2022, Last modified: 2022-01-13. Accessed: 2024-08-03. https://www.scmp.com/economy/china-economy/article/3163097/chinas-factories-are-wrestling-labour-shortages-age-old.

Huang, Laura Silver, and Christine Silver. Key Facts about China's Declining Population. 2022, Published: 2022-12-05. Accessed: 2024-08-02. https://www.pewresearch.org/short-reads/2022/12/05/key-facts-about-chinas-declining-population/.

Hui, Victoria Tin-bor. *War and State Formation in Ancient China and Early Modern Europe*. Accessed: 2024-07-23, Cambridge University Press, 2005, https://www.cambridge.org/core/books/war-and-state-formation-in-ancient-china-and-early-modern-europe/F81552218F82BDF65C54DF0BC08759D0.

Jenner, W. J. F. "The Hundred Flowers". *Index on Censorship*, vol. 9, no. 1, Feb. 1980, Accessed: 2024-07-25, pp. 7–12. https://doi.org/10.1080/03064228008533016.

Jian, Ma. China's Barbaric One-Child Policy. 2013, Published: 2013-05-06. Books section. Accessed: 2024-06-19. https://www.theguardian.com/books/2013/may/06/chinas-barbaric-one-child-policy.

Jiang, Quanbao, and Jesús J. Sánchez-Barricarte. "The 4-2-1 Family Structure in China: A Survival Analysis Based on Life Tables". *European Journal of Ageing*, vol. 8, no. 2, May 2011, Accessed: 2024-08-03, p. 119. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5547295/.

Jisen, Ma. "The Politics of China's Population Growth". *Asian Perspective*, vol. 22, no. 1, 1998, Accessed: 2024-06-19, pp. 35–52. https://www.jstor.org/stable/42704155.

Kung, James Kai-sing, and Justin Yifu Lin. "The Causes of China's Great Leap Famine, 1959–1961". *Economic Development and Cultural Change*, vol. 52, no. 1, 2003, Accessed: 2024-07-13, pp. 51–73. https://www.jstor.org/stable/10.1086/380584.

Kwakernaak, Huibert. "Application of Control Theory to Population Policy". *New Trends in Systems Analysis*, edited by A. Bensoussan and J. L. Lions, Springer, 1977, pp. 357–78.

Latour, Bruno. *Science in Action: How to Follow Scientists and Engineers through Society*. Harvard University Press, 1987.

Lee, Leo Ou-fan. *Voices from the Iron House: A Study of Lu Xun*. Indiana University Press, 1987. Studies in Chinese literature and society.

Li, Nan. Communique of the Third Plenary Session of the 11th Central Committee of the Communist Party of China. 2018, Last modified: 2018-06-26. Accessed: 2024-08-12. https://www.bjreview.com/Special_Reports/2018/40th_Anniversary_of_Reform_and_Opening_up/Timeline/201806/t20180626_800133641.html.

Li, Shuhua. Natural Philosophy of I Ching and Life Practice. 2012, Translated by Zhao Kuang. Last modified: 2012-07-06. Accessed: 2024-06-20. https://philo.nju.edu.cn/f4/54/c4692a128084/page.htm.

Li, Xiaorong. License To Coerce: Violence Against Women, State Responsibility, and Legal Failures in China's Family-Planning Program. 2015, Published: 2015-10-23. Accessed: 2024-07-12. https://openyls.law.yale.edu/handle/20.500.13051/7212.

Lin, Justin Yifu, and Dennis Tao Yang. "On the Causes of China's Agricultural Crisis and the Great Leap Famine". *China Economic Review*, vol. 9, no. 2, 1998, China's Great Famine special issue. Accessed: 2024-07-13, pp. 125–40. https://www.sciencedirect.com/science/article/pii/S1043951X99800108.

Lin, Zhibo. 究竟什么是基本国策？. 2007, Last modified: 2007-05-08. Accessed: 2024-06-15. https://web.archive.org/web/20160304092646/http://politics.people.com.cn/GB/30178/10013649.html.

Lu, Xing. *Rhetoric of the Chinese Cultural Revolution: The Impact on Chinese Thought, Culture, and Communication*. University of South Carolina Press, 2020.

Malthus, Thomas Robert. *An Essay on the Principle of Population*. Oxford University Press, 1999.

Mann, Charles C. The Book That Incited a Worldwide Fear of Overpopulation. 2018, Last modified: 2018-01. Accessed: 2024-07-09. https://www.smithsonianmag.com/innovation/book-incited-worldwide-fear-overpopulation-180967499/.

Masini, Eleonora Barbieri. "Futures Studies in Italy and The Limits to Growth". *Futures*, vol. 33, no. 1, Feb. 2001, Accessed: 2024-07-16, pp. 21–26. https://www.sciencedirect.com/science/article/pii/S0016328700000501.

Meadows, Donella H., et al. *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*. 2nd ed., Universe Books, 1976.

Mencius. The Works of Mencius. Translated by James Legge. Accessed: 2024-06-20. https://en.wikisource.org/wiki/The_Chinese_Classics/Volume_2/The_Works_of_Mencius/chapter07.

Minami, Kazushi. *People's Diplomacy: How Americans and Chinese Transformed US-China Relations during the Cold War*. Cornell University Press, 2024.

Moffatt, Mike. The Cause Behind the Post-War Economic Housing Boom After WWII. 2020, Last modified: 2020-01-27. Accessed: 2024-07-18. https://www.thoughtco.com/the-post-war-us-economy-1945-to-1960-1148153.

Nordhaus, William D. "World Dynamics: Measurement Without Data". *The Economic Journal*, vol. 83, no. 332, Dec. 1973, pp. 1156–83.

Office of Technology Assessment. "Evolution of China's Birth Planning Policy". *World Population and Fertility Planning Technologies: The Next 20 Years*, Congress of the U.S., Office of Technology Assessment, 1982, pp. 205–19.

Phillips, Tom. The Cultural Revolution: All You Need to Know about China's Political Convulsion. 2016, Published: 2016-05-11. Accessed: 2024-07-15. https://www.theguardian.com/world/2016/may/11/the-cultural-revolution-50-years-on-all-you-need-to-know-about-chinas-political-convulsion.

Qian, X. Z. Implementation of China's Population Policy. Vol. 1, 1, May 1983, pp. 8–13.

Remais, Justin. Berkeley Study: Historic Famine Leaves Multiple Generations Vulnerable to Infectious Disease. 2023, Last modified: 2023-09-28. Accessed: 2024-07-13. https://publichealth.berkeley.edu/news-media/research-highlights/historic-famine-leaves-multiple-generations-vulnerable-to-infectious-disease.

Revelle, Roger. "Paul Ehrlich: New High Priest of Ecocatastrophe". *Family Planning Perspectives*, vol. 3, no. 2, 1971, Edited by Paul R. Ehrlich, Anne H. Ehrlich, and W. H. Freeman. Accessed: 2024-07-16, pp. 66–70. https://www.jstor.org/stable/2134034.

Sanderson, Warren C. "Simulation Models of Demographic, Economic, and Environmental Interactions". *Population — Development — Environment*, edited by Wolfgang Lutz, Springer, 1994, pp. 33–71.

Sha, Shangzhi. 从反右运动看中国特色的政治斗争. 2020, Last modified: 2020-11-25. Accessed: 2024-07-25. https://web.archive.org/web/20201125014337/http://www.yhcqw.com/36/8945.html.

Short, Susan E., and Fengying Zhai. "Looking Locally at China's One-Child Policy". *Studies in Family Planning*, vol. 29, no. 4, 1998, Accessed: 2024-06-09, pp. 373–87. https://www.jstor.org/stable/172250.

Smil, Vaclav. "China's Great Famine: 40 Years Later". *BMJ: British Medical Journal*, vol. 319, no. 7225, Dec. 1999, Accessed: 2024-07-13, pp. 1619–21. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1127087/.

Song, Jian. "Systems Science and China's Economic Reforms". *IFAC Proceedings Volumes*, vol. 18, no. 9, 1985, IFAC/IFORS Symposium on Control Science and Technology for Development, Beijing, PRC, 20–22 August 1985. Accessed: 2024-06-17, pp. 1–7. https://www.sciencedirect.com/science/article/pii/S1474667017602520.

Song, Jian, et al. *Population Control in China: Theory and Applications*. Praeger, 1985.

Song, Jian, et al. "Population System Control". *Mathematical and Computer Modelling*, vol. 11, 1988, Accessed: 2024-06-17, pp. 11–16. https://www.sciencedirect.com/science/article/pii/0895717788904438.

The Great Proletarian Cultural Revolution in China, 1966-1976. Accessed: 2024-07-14. https://www.sjsu.edu/faculty/watkins/cultrev.htm.

Tien, H. Yuan. "Demography in China: From Zero to Now". *Population Index*, vol. 47, no. 4, 1981, Accessed: 2024-07-25, pp. 683–710. https://www.jstor.org/stable/2736034.

———. "Wan, Xi, Shao: How China Meets Its Population Problem". *International Family Planning Perspectives*, vol. 6, no. 2, 1980, Accessed: 2024-06-10, pp. 65–70. https://www.jstor.org/stable/2947873.

Uberoi, Patricia. "Chinese Conversion To Scientism: Scientism in Chinese Thought". *China Report*, vol. 4, no. 2, Mar. 1968, Accessed: 2024-06-17, pp. 33–35. https://doi.org/10.1177/000944556800400209, http://journals.sagepub.com/doi/10.1177/000944556800400209.

U.N. Resolution 2758 (U.N. Voted to Admit Communist China, Expel Nationalist Delegates.) 2010, Last modified: 2010-06-07. Accessed: 2024-07-14. https://web-archive-2017.ait.org.tw/en/un-res-2758-voted-to-admit-commiunist-china.html.

Understanding the Two Sessions: What Is Xiaokang? 2020, Last modified: 2020-05-24. Accessed: 2024-08-12. http://www.xinhuanet.com/english/2020-05/24/c_139083861.htm.

United Nations. Post-War Reconstruction and Development in the Golden Age of Capitalism. July 2017, Accessed: 2024-07-16, pp. 23–48. https://www.un-ilibrary.org/content/books/9789210605984c009/read.

"United Nations Population Award to Indira Gandhi and Qian Xinzhong". *Population and Development Review*, vol. 9, no. 4, 1983, Accessed: 2024-06-20, pp. 747–53. https://www.jstor.org/stable/1973563.

Vidal, Christine. The 1957-1958 Anti-Rightist Campaign in China: History and Memory (1978-2014). 2016, Published: 2016-04-25. Accessed: 2024-07-25. https://shs.hal.science/halshs-01306892.

Wang, Youqin. Student Attacks against Teachers: The Revolution of 1966. Mar. 2001, Journal/source not specified in citation, pp. 29–79.

Wang, Zhihe, et al. "Ending an Era of Population Control in China: Was the One-Child Policy Ever Needed?" *The American Journal of Economics and Sociology*, vol. 75, no. 4, 2016, Accessed: 2024-06-19, pp. 929–79. https://www.jstor.org/stable/45129326.

Wei, Shang-Jin, et al. "Home Ownership as Status Competition: Some Theory and Evidence". *Journal of Development Economics*, vol. 127, July 2017, Accessed: 2024-09-14, pp. 169–86. https://www.sciencedirect.com/science/article/pii/S0304387816301006.

What Were the Goals of the Cultural Revolution? 2021, Last modified: 2021-11-30. Accessed: 2024-07-13. https://www.britannica.com/question/What-were-the-goals-of-the-Cultural-Revolution.

White, Tyrene. "China's Population Policy in Historical Context". *Reproductive States: Global Perspectives on the Invention and Implementation of Population Policy*, edited by Rickie Solinger and Mie Nakachi, Accessed: 2024-06-19, Oxford University Press, 2016, https://doi.org/10.1093/acprof:oso/9780199311071.003.0011.

Whyte, Martin King, et al. "Challenging Myths About China's One-Child Policy". *The China Journal*, no. 74, 2015, Accessed: 2024-06-10, pp. 144–59. https://www.jstor.org/stable/10.1086/681664.

Xinhua News Agency. 新闻背景：我国生育政策在实践中逐渐完善. 2013, Last modified: 2013-12-28. Accessed: 2024-06-19. https://www.gov.cn/jrzg/2013-12/28/content_2556489.htm.

Yi, Fuxian. 大国空巢: 反思中国计划生育政策. 中国发展出版社, 2013.

Zhang, Fan, et al. 中国人口与计划生育大事要览. 中国人口出版社, 2001.

在上海市举行的科学技术工作会议上 周总理阐述科学技术现代化的重大意义. 2016, Last modified: 2016-02-14. Accessed: 2024-08-12. https://web.archive.org/web/20160214201234/http://rmrbw.net/read.php?tid=302475.

新中国档案：'百花齐放、百家争鸣'方针的提出. 2009, Last modified: 2009-08-27. Accessed: 2024-07-25. https://www.gov.cn/test/2009-08/27/content_1402513.htm.

Skepticism about Expert Identification

Yichen Wang

Hong Kong International School

The dilemma of identifying expertise has long faced skepticism. In such situations, an epistemic novice–someone with limited knowledge and skills in a certain domain–struggles to verify the expertise of an expert who has access to superior knowledge and skills. This expert, an individual with formal or informal training who possesses competence beyond that of extensive experience, specializes in a certain domain, having epistemic authority over a wide range of propositions and skills.

The argument about skepticism regarding expert identification is strong at first glance. There is real epistemic difficulty since a novice lacks the tools needed to evaluate whether someone is actually an expert. This creates a problem because one cannot assess expertise unless one already possesses it. However, upon further review, the argument fails because it relies on a strict standard that is unreasonable since it undermines the manner in which a novice can responsibly identify an expert through both social and second-order means.

The premise that appears problematic is the second one, stating that "novices can justifiably identify someone as an expert only if they can assess whether the person is sufficiently well placed in the relevant domain" (Watson p. 178), which is known as the easy recognition problem (ERP). It becomes a problem of circularity because to spot an expert, one must already be an expert. This approach is unappealing because there is no clear way to directly identify an expert.

In real-life situations, it is common to see a novice rely on second-order indicators of expertise. According to Watson, second-order indicators include credentials, institutional affiliation, peer endorsement, and track records (p. 179). Unfortunately, despite having some benefits, they are ultimately useless. This is because novices are typically not in a position to assess domain-specific material, even though they can evaluate simple social signals. Goldman supports Watson in Chapter 7 by identifying the concept of reliability, which explains that justified belief through a reliable process is not enough to identify an expert.

For instance, during the COVID-19 pandemic, many individuals claimed expertise on public health via social media, displaying titles like "Doctor" or "Epidemiologist" without proper credentials. Novices, overwhelmed by contradictory voices, often turned to institutional affiliations or publication records to make judgments. While these second-order indicators were sometimes misleading, they remained essential tools in distinguishing between pseudoscience and legitimate expertise. As Alvin Goldman notes, what matters is whether the process of belief-formation is generally reliable, not whether the believer possesses full understanding.

The skeptic's second rejection of second-order markers collapses under its own premise. Watson argues about the wicked domain, which "are those in which it is difficult to obtain reliable feedback about performance, and where this makes it hard to tell who the genuine experts are" (p. 210). Without the immediate and reliable feedback of a "kind domain", wicked domains are liable to manipulation, the novices being at the mercy of possibly biased epistemic

authority. This is typically seen in blindly trusting novices being deceived by credentials or uninterpretable, misleading information.

A useful contrast lies between domains like chess and contemporary art. In chess, expertise is evident through repeated performance and clear win-loss outcomes, which is a "kind" domain. In contrast, contemporary art criticism is a "wicked" domain, where feedback is ambiguous, success is interpretive, and consensus among experts is rare. In such cases, novices struggle even more to evaluate who possesses genuine authority.

It is important to acknowledge that knowledge is socially distributed. There is a view of epistemic dependence where people must trust each other in order to know anything. Watson explains, "trust in experts is not epistemically optional" (p. 139). When expertise is present, novices can learn enough to become experts too. A novice can't identify an expert without sufficient knowledge, and that is why this argument collapses on itself.

One might object that relying heavily on second-order indicators opens the door to manipulation. Institutions may become gatekeepers of expertise, enabling those with power or prestige to be misidentified as experts. For example, in high-profile academic fraud cases, individuals with impressive credentials published fabricated results for years before detection. If novices cannot assess domain-specific content, how can they guard against such failures?

While this concern is valid, it does not follow that we should discard second-order mechanisms entirely. Watson emphasizes that these mechanisms function not in isolation but within social networks that allow for correction, such as peer review, public scrutiny, and whistleblowing. In fact, many cases of fraud were ultimately exposed through such systems, not through direct domain expertise. Therefore, instead of seeking infallibility, novices can adopt a policy of defeasible trust—trust that is open to revision as more evidence becomes available.

This problem instead leads to epistemic paralysis. If a novice cannot truly identify an expert until they themselves are an expert, then nobody can begin their process of learning. Watson states the circular problem presented blocks "justified belief in any expert testimony" (p. 138). For real-life applications, this argument does not work because there are complex domains where expertise is relied on.

The qualifications to identify an expert are too rigid to be defensible. It assumes epistemic autonomy that does not consider real-life situations. People form justified beliefs in different ways. A novice seeks an expert to learn from. They trust the information shared by the expert because of factors like trust in their credentials and overall credibility. Justified beliefs are rational because they stem from some background knowledge that leads to their desire to graduate from novice to expert. This rational trust, informed by proper second-order evidence, dismantles the skeptical argument of novices recognizing that experts are impossible.

While the skeptical argument highlights a disconnect in novice-expert relations, it ultimately fails. The second proposition illogically demands that novices must directly assess expert placement is unreasonably strict and leads to epistemic paralysis. The proposed solution, second-order markers, while imperfect, are indispensable tools for navigating expertise in real life. The fact that these markers are unreliable, particularly in wicked domains, only strengthens the need for trust and socially distributed knowledge. Since knowledge acquisition depends on these social mechanisms, the skeptical standard collapses under its own premise.

References

Watson, Kevin. *Fixing Expert Testimony: Epistemology and the Problem of Expert Disagreement.* Oxford University Press, 2022.

The Incompatibility of Luck and Knowledge

Kyle Chang

Dougherty Valley High School

The definition of knowledge has long been a subject of dispute, with numerous philosophers offering their own interpretations throughout history. One of the most famous theories of knowledge, the JTB or justified true belief theory proposed by Plato and Theaetetus, describes S knowing p if and only if: p is true, S believes p, and S is justified in believing p. The JTB analysis also included the assumptions that justified beliefs could be false and that deductions from p are justified in their belief. This broad theory of knowledge was widely accepted until philosopher Edmund Gettier illustrated how the JTB was not sufficient for knowledge, countering the theory and creating Gettier cases.

Gettier cases became counterexamples used to disprove proposed theories of knowledge. An example of a Gettier case that could be used to disprove the JTB is in the case of a broken clock: person P walks into a room at exactly 3:00 PM, looking at a typically reliable clock reading 3:00. While your reasoning to believe it's 3:00 PM is perfectly justified, in fact, the clock stopped working exactly 12 hours ago. So by pure luck, all three requirements for knowledge are met, even though the truth was fully accidental. Gettier cases like these typically follow a bad luck plus good luck pattern, or in this case, bad luck being the clock breaking 12 hours ago, followed by good luck of the person checking the clock at exactly 3:00 PM.

The "Safety Theory" informs us that a belief, even a true belief, may not necessarily count as knowledge. This is due to the fact that a certain belief could have been false. Some true beliefs may be accidental. For example, Elizabeth may have been driving through Barn County and seen what she thinks is a barn. She identifies that the structure she saw is a barn. However, the Barn County she's driving through is filled with false barn facades. In addition, the one that Elisebeth saw was, in fact, a real barn. Elizabeth's belief that this is a barn is justified. However, her seeing a real barn in an area with many fake barns is only by chance. She could have easily seen a fake barn and believed it was a real barn. Her belief that she's looking at a barn is not free from error. For a belief to align with the Safety Theory, it must be a belief that doesn't have error.

A productive way to evaluate theories of knowledge is to test them against deliberately constructed Gettier counterexamples. Zagzebski provides a general "recipe" for generating such cases, showing that any account lacking an explicit luck component will be vulnerable. The process begins with a belief that clearly satisfies the theory's conditions for knowledge, then introduces bad luck to disrupt the normal connection between justification and truth. Finally, good luck is added to restore the truth. This combination of bad luck and good luck in Gettier cases blocks the theory of knowledge, resulting in a belief that is true, but accidental.

Zagzebski's method illustrates why any theory that fails to exclude this "bad luck + good luck" pattern will remain susceptible to counterexamples. The safety theory responds by adding

a condition: a belief counts as knowledge only if it remains true across most nearby possible worlds. This condition blocks the final "good luck" step by making the truth stable.

References

Gettier, E. L. "Is Justified True Belief Knowledge?" *Analysis*, vol. 23, no. 6, June 1963, pp. 121–23. https://doi.org/10.1093/analys/23.6.121, https://doi.org/10.1093/analys/23.6.121.

Orozco, Joshue. "Epistemic Luck". *Philosophy Compass*, vol. 6, no. 1, Jan. 2011, pp. 11–21. https://doi.org/10.1111/j.1747-9991.2010.00365.x, https://doi.org/10.1111/j.1747-9991.2010.00365.x.

Zagzebski, Linda. "The Inescapability of Gettier Problems". *The Philosophical Quarterly*, vol. 44, no. 174, Jan. 1994, p. 65. https://doi.org/10.2307/2220147, https://doi.org/10.2307/2220147.