Public Opinion and National Security: An Emerging Technology Perspective in the Age of AI

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Abstract

Most people assume the future of AI will be decided exclusively by leading AI firms, informed by research from prestigious university labs, and regulated by policy wonks concentrated in the U.S. government. But the history of emerging technology national security policy paints a different, more complicated picture.

Public opinion has shaped many critical national security decisions, such as the United States' push to land a man on the moon. For 21st century emerging technologies, public attitudes will likely matter even more. Dual-use technologies which everyday people can buy at the hardware store have proliferated. Industrial policy questions have entered widely watched presidential debates. And individuals have become wary that technologies they use daily, like TikTok, could be banned in the name of national security. All these developments have pushed the newest wave of emerging technology from situation rooms and boardrooms into the public eye. The key question has become not *whether* public opinion matters, but *how* publics respond to key national security challenges defined by their emerging technology context.

This article-based dissertation advances three arguments explaining how individual *consumption*, *production*, and *experience* of security in emerging technology domains impact public opinion. I show publics follow friendshoring logics when deciding which technologies to purchase, double-down in their willingness to bear economic costs when faced with adversarial tech competition, and respond hawkishly to threats even when protected from material violence by substantially improved defensive technologies. These theories are validated using original survey and natural experiments from the UK navigating U.S.-China tech competition, Taiwan amidst threats to its semiconductor "Silicon Shield," and post-Iron Dome Israel during conflicts with Hamas.

Taken together, this dissertation illustrates how publics react to emerging technology-related national security challenges, with important lessons for AI governance as potentially transformative frontier systems rapidly penetrate increasingly interconnected public and national security domains.

Acknowledgments

In Chinese, the idiom story 狡兔三窟 (*jiǎo tù sān kū*) refers to a hare with three burrows. It is normally used metaphorically to describe a crafty person with many different plans and back-up plans — often in a derogatory way. But over the last five years, 狡兔三窟 has not simply been a moral lesson. It has become my lived reality. For me, this Ph.D. has been about hopping around three burrows across three continents, making each of them my research and personal home. These burrows are less steep than Alice's Rabbit Hole and roomier than Bilbo Baggins' Bag End. But not too dissimilar from Wonderland and Middle-earth, these burrows have been filled with unwieldy turns, courageous battles, strange interludes, and an extraordinary cast of characters which has made this Ph.D. experience truly magical.

If Oxford's burrow has a Gandalf, it is surely my supervisor, Duncan Snidal. All-knowing and all-wise, Duncan has guided this project and me from the beginning of my time as a graduate student. He has improved this work at every stage with the critical eye of a Chicago schooler, but always with a gentle Canadian touch. More importantly, Duncan has fundamentally transformed the way I think, empowering me to evaluate international events — and in fact, important life decisions — with rational precision (most of the time).

True to its bureaucratic overtones, Oxford contains burrows within burrows — Hogwarts-style sub-burrows, as Kafka might have called them — providing me with a multitude of communities that have provided me with deep intellectual fulfillment over the course of my DPhil journey. There has been no sub-burrow more important than the Department of Politics and International Relations, my intellectual home for five years. Gordon Barrett, Todd Hall, Karolina Milewicz, and Andrea Ruggeri all played critical supervisory roles over the course of writing this dissertation, providing both important intellectual interventions and life advice alike. Richard Caplan, Janina Dill, Dominic Johnson, and Andy Payne offered invaluable feedback and support throughout critical junctures of my DPhil journey. DPIR staff — especially Andrew Melling, Jenny Crewe, and Zoe Saul — made everything happen behind the scenes. Todd Hall and Spyros Kosmidis sharpened this dissertation with important feedback at the Confirmation of Status stage. I am deeply honored that David Edelman and Robert Trager kindly agreed to serve as this dissertation's examiners. I am indebted and grateful to the Clarendon Fund and Balliol College for believing in this dissertation's vision and financially supporting my Ph.D.

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Michael Cerny, Haydn Belfield, and Sam Seitz for their uniquely active engagement with my work across the entire DPhil process. Julia Carver sat by my side from the first day of this dissertation until the last, read every single word of every single chapter, and was the ultimate bud when I needed a pick me-up. She somehow managed to make sitting in the call-center-vibed DPIR deeply enjoyable, even during the most challenging times.

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While the Oxford burrow was colored with late-night formals and walks amidst hidden gardens, a second burrow — with alleyways protruding in every direction, vertical signs sloping down the sidewalks, and incomparable wet heat that leaves you sweating after a mere 10 minutes outside — provided me with my intellectual home for the second year of my DPhil. During my Taipei year, the extraordinary teachers at the International Chinese Language Program made my time intellectually enriching and personally fulfilling. For their extraordinary dedication to teaching me, I am grateful to Cao Zhongqi, Cui Yihe, Feng Wenyun, Li Enrou, Mu Guizhen, Peng Qiaoyu, Qiu Minxuan, Tian Xiaopei, Wang Ruyin, Weng Cili, and Xiao Ruiling. I am especially grateful to the ultimate *daoshi*, Chen Liyuan, whose unwavering belief in me pushed my Chinese to levels I never imagined. Thank you to the National Bureau of Asian Research, which made this extraordinarily impactful experience possible.

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And lastly, there is the Washington burrow, a burrow defined less by its rows of embassies, halls of power, or even its media bureaus than by memories of a 14-year-old version of myself in the suburbs buried in a high school government textbook, enthralled by ideas, determined to see every corner of the globe, and inspired to change the world through the written word. The extraordinary instructors at Walt Whitman High School and University of Chicago provided me with the intellectual foundation and confidence to complete this Ph.D. Dear friends Alex, Ben, Felipe, Hannah, and Noah were always a FaceTime or Zoom away, providing ample encouragement and needed perspective on the things that matter most. I am eternally grateful to my four loving grandparents — Beth, Ella, Howie, and Sanford — who gave me the unwavering strength, unmitigated love, and unfailing support to pursue this Oxford dream. And of course, my mom, my dad, and Abby made every sacrifice imaginable to create an environment in which I would thrive and have always made homebase unequivocally loving (Ozzie, while certainly loving, made few sacrifices to make this Ph.D. easier!). My dad, in particular, acted as both a sounding board and eagle-eye proofreader of every single one of this dissertation's hundreds of thousands of words. When he dropped me off at school as a child, he would remind me to learn a lot, do my best, and have fun. There's been a lot of school since then, but those three lessons have stuck with me through this DPhil.

As I leave Oxford and embark on my next journey, I have realized that 狡兔三窟 is actually a misnomer — or at the very least, an undercalculation. My world is no longer trifurcated across Oxford, Taipei, and Washington, but dispersed across dozens of burrows around the globe and accompanied by the most extraordinary of friends, some of whom embarked on this crazy journey with me the very first day and saw me through to the very last. There's a quiet burrow a few dozen kilometers north of Nürnberg by Deutsche Bahn in Spardorf, where Leo eats (mostly) carrots, comments on seasonal variation in water temperatures, cycles three-digit-kilometer distances, and inspires me to run faster and stretch my arms farther — in all the best ways. There's a bustling burrow in Bangkok, filled with shopping malls and GrabBikes, in which Jas runs from her Russian squats program to Hyrox to the climbing gym in approximately 45 minutes before bringing me home to my most extraordinary "Thai family." There's a beautiful burrow near the Italian/French border in Monaco, where Virginia continues to inspire me with her sheer determination, fiery loyalty to her friends, and presence during the moments that matter. There's a relentlessly optimistic and smiley burrow in snowy Oslo and its surrounding cabins, where Jaki crunches numbers, sautés aubergines, and drinks Neck Oil and Tribute, especially on the 17th of May. And there's a burrow down under just north of the Sunny Coast on the M1 in Gympie, where Kye temporarily expands and contorts my vocabulary (up the cowdois!) but reminds me of the borderless

power of unparalleled heart, courage, and moral clarity. And memories with other extraordinary friends who came into my life along this PhD journey — A. J., Ale, Dan, Élise, Josh, Kofi, Mathias, Paul, Rach, Salma, Sam, Shrez, and Zac, among many others — will travel with me wherever I go in the world.

During this Ph.D. I have absorbed a tremendous amount about public opinion, national security, and emerging tech, learned shockingly little about how to be concise, and developed an appropriate degree of self-awareness. But it is the experiences I have had along the way I will hold onto most dearly. If you had told me in mid-2021 that I would leave this Ph.D. having run half-marathons on four continents, successfully driven on left side of the road for hundreds of kilometers in the dark without crashing, discovered the joys of eating rambutan and peanut douhua, walked from Zimbabwe to Zambia and back (it's not as far as it sounds), learned to successfully distinguish Aussie, English, and South African accents with an approximately 85 percent success rate (it's far harder than it sounds), and read a book on contemporary Chinese history cover-to-cover in Mandarin, I would not have believed you. 狡兔三窟 refers to a world in which we may take one of many paths. But not only is there no single inevitable path we will take, but there are also paths we have never conceived of as possible. The six chapters that comprise this dissertation are but one in my life. Who knows what the second, the third, and every chapter thereafter will bring—

I leave you on one final, somber note. In this final month of writing up my heart has been heavy, as my ultimate editor, teacher, and fan, Poppop, passed away. He was a journalist, writer, and storyteller who taught me the power of words, a secret power he had gained from lessons learned from when his stories colored the pages of TIME, and equally from when his tales traversed the dock at Butternut Bay during high and low tide alike. I hope the words of this dissertation do some good in the world and touch people the way his words touched me. He will exist in the burrow of my heart forever, wherever I go. This dissertation is dedicated to him.

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Introduction

"Some politicians have started talking about banning TikTok. Now this could take TikTok away for all 150 million of you. I'll be testifying before Congress later this week to share all that we're doing to protect Americans using the app and deliver on our mission to inspire creativity and to bring joy. Let me know in the comments what you want your elected representatives to know what you love about TikTok."

– SHOU ZI CHEW, CHIEF EXECUTIVE OFFICER OF TIKTOK, MARCH 2023

1.1 Overview

Two days prior to testifying in front of Congress in March 2023, TikTok CEO and Singapore national Shou Zi Chew appealed to the judgment of a different demographic: American teenagers everywhere. He appeared on smartphones around the country saying: "Some politicians have started talking about banning TikTok. Now this could take TikTok away for all 150 million of you. I'll be testifying before Congress later this week to share all that we're doing to protect Americans using the app and deliver on our mission to inspire creativity and to bring joy. Let me know in the comments what you want your elected representatives to know what you love about TikTok" (TikTok 2023).

As Shou's appeal demonstrates, the battle to ensure TikTok's continued presence in the U.S. and beyond under ByteDance's ownership is not simply taking place in Congressional committee rooms. Rather it is a battle to win over the hearts and minds of its users: everyday people. And it is not just the American public who may shape TikTok's sustained commercial viability amidst concerns around its substantial data collection, potential use for state espionage, and use in influence operations (Tidy 2024). Indeed, the

United States — which in April 2024 signed into law the Protecting Americans from Foreign Adversary Controlled Applications Act to effectively ban or force the sale of the app (Maheshwari, McCabe, and Karni 2024) — lags behind a plethora of other countries that have moved to regulate TikTok. A global audience, spanning India to Indonesia, Dakar to Sydney, of a billion users has the power to constrain any policymaker who seeks to regulate TikTok.

In each of these countries, security is no longer strictly the domain of regulators in defense ministries and secret intelligence meetings. Emerging technologies[1] in the era of TikTok have dislodged security from the exclusive purview of national security councils to the fingertips of Joe the Plumber (or Joe the Online Influencer). Now, the preferences and choices of individuals doing the WAP Dance and Blinding Lights Challenge are filtering up the policy food chain into the most exclusive echelons of national security decision-making. It is part of a broader trend at the intersection of contemporary emerging technology and national security: we now regularly consume technologies that are not just personally enjoyable but also critical for our national security, produce goods that were once seen as primarily commercial inputs but now form the crux of critical networks of dependence, and experience conflicts and insecurity in fundamentally different ways because of transformations and advances in military technology. These technologies touch our lives and bring some of the most pressing security challenges of our time to our front doors — with billions of dollars in R&D funding, company revenue, and foreign aid on the line. Shouldn't we consider, therefore, how emerging technology contexts shape public attitudes toward these national security challenges?

1.2 Beyond Boardrooms and Situation Rooms: Why Public Opinion Matters for Emerging Technology-Related National Security Issues

At first glance, it may seem puzzling that public opinion could play a critical role in shaping an area as sensitive and technocratic as national security, particularly in the especially sensitive and technocratic area of emerging technology. Indeed, whether and how public opinion shapes national security decisions, and whether this is normatively positive, has shaped robust debate within the field of international relations. Among the loudest skeptics are some of the foundational thinkers in IR: a prominent group of realists who argued that national security decisions are and should be kept distant from the public. Wildavsky (1966) contended in his two presidencies thesis that foreign policy outcomes were relatively insulated from public opinion pressures, specifically because they were the most distant from the public. Geographically at least, foreign policy issues were far from many publics, including those in the United

[1] I use Rotolo, Hicks, and Martin (2015)'s definition of emerging technology. Their definition highlights five key technological attributes: radical novelty, relatively fast growth, coherence, prominent impact, and uncertainty and ambiguity.

States. Even harsher critics warned of the dangers of allowing public opinion into the national security decision-making. Building on the work of Gabriel Almond and Walter Lippmann — the founding fathers of the so-called Almond-Lippmann consensus — these scholars argued international politics "is a professional activity that is not—or should not—be responsive to the ill-informed whims of the voting public" (Payne 2023: 3).[2] Hans Morgenthau, whose thinking would shape contemporary international security studies (Crawford 1991: 293), wrote in his iconic *Politics Among Nations* that, "The harmony between foreign policy and public opinion may well have been achieved at the price of surrendering the principles of good foreign policy to the unsound preferences of public opinion" (Morgenthau 1978: 159). George Kennan, the father of the theory of containment, saw publics as easily susceptible to extreme ideas and a breeding ground for special interests (Kennan 1951: 61-2). Thomas Bailey described "the dangers of flying in the face of public opinion," arguing that US presidents, including Theodore Roosevelt, James Polk, and Franklin Delano Roosevelt, had strong incentives to resort to deception to curb public opinion (Bailey 1948: 8). Lippmann himself, who by the 1950s was the United States' most influential political columnist (Holsti 2004: 32), warned of "excess of democracy", "misrule by the people", and "a dangerous master of decision when the stakes are life and death" (Lippmann 1955 in Holsti 2004: 32-3).

These arguments on the so-called "moodless" and distortionary role of the public were designed to apply broadly to national security, but they may seem especially relevant for emerging technologies. Emerging technologies and their applications like TikTok are often technically complicated, making them even more complicated for the average voter to understand, rendering emerging technology issues an area of national security policy where we might expect public opinion to matter *the least*. These lines of argument, which I collectively call the *technocratic school*, imply that the next generation of emerging technologies will be developed, deployed, and regulated based on the exclusive demands, interests and beliefs of technical experts concentrated in Silicon Valley and policy wonks inside the Beltway.

It is easy to envision a mental map in which frontier artificial intelligence is developed across the top AI labs in OpenAI, Google DeepMind, and Anthropic, informed by research at Oxford, Cambridge, and MIT, and regulated by various U.S. government actors spanning the Departments of Commerce, Defense, and State — an empirical reality of a governance space shaped primarily by states, firms, and researchers (Leung 2019). We might imagine distinguished dignitaries rounding tables for AI summits in Bletchley Park, Seoul, and Paris, or envision representatives from the great powers diligently debating

[2] For a more extensive discussion of Morgenthau, Kennan, Bailey, and other foundational public opinion thinkers, see Holsti (1992).

how to define the frontier of the field in storied restaurants, bars, and hotels during dialogues in Bangkok, Geneva, and Singapore. For a select few readers, you will not need to imagine these rooms — you were in these rooms yourself. And for those who have been in these rooms, it might be convenient to think that the leaders of the cross-cutting fields of AI ethics, governance, and safety should interact exclusively in these snug spaces.

Such a mental map, however, is both overly simplistic and ethically irresponsible. Inevitably, some of the most critical elements of emerging technology development and deployment has and will continue to take place in restricted-access research labs, behind classified computer screens, and across discrete multinational dialogues, but possibly far less than the realists of yesteryear would suggest. The historical record in national security, along with further IR scholarship that has emerged in response to the technocratic school, reveals that much.

Many of the most critical national security decisionmakers are elected leaders with constituents, and they care about what their constituents think about national security issues because they want to win elections — sometimes at the expense of what the national security establishment considers strategically optimal (Payne 2023). These leaders care so much about public opinion that they consistently seek data — both quantitative and qualitative — to build national security policy that takes the opinions of the public into account. This is not a new phenomenon but a long-standing reality. U.S. President Franklin Delano Roosevelt received access to polling data on attitudes toward potential U.S. intervention in World War II starting in 1939 (Berinsky 2009: 34). Decades later, U.S. President Richard Nixon requested polling data on specific foreign policy issues as opposed to broader survey results (Druckman and Jacobs 2006). It is perhaps unsurprising, then, that when formulating his South Vietnam policy in 1972, following the Democratic nomination of George McGovern, Nixon famously remarked to his Secretary of State Henry Kissinger that, "we also have to realize, Henry, that winning an election is terribly important" (Schwartz 2009: 174). In Graham Allison's analysis of the Cuban Missile Crisis, he attributes John F. Kennedy's decision to pursue a blockade of Cuba as partially a domestic political calculation. He cites then U.S. Secretary of Defense Robert McNamara remarking on the crisis, "It's not a military problem we're facing. It's a political problem." Robert Kennedy reflected further on the choice to enact a blockade, "Well there isn't any choice. I mean, you would have been, you would have been impeached" (Allison and Zelikow 1999: 113). These electoral pressures have shaped U.S. national security policy from World War I through contemporary conflicts like Iraq (Payne 2019, 2021, 2023). And electoral pressures will likely shape conflict and other foreign policy outcomes far beyond it.

Even in the world of emerging technology of national security governance — whose insiders today regularly toss around archaic terms like "reinforcement learning," "neural networks," and "graphic processing units" — public opinion has historically been a critical variable shaping the intersection of technology policy and national security (Dafoe 2018: 39). It was actually public opinion that plunged the U.S. into a space race with the Soviets — a race which U.S. policymakers initially sought to avoid. However, the Soviet launch of Sputnik had what NASA's Chief Historian Roger Launius called "a 'Pearl Harbor' effect on American public opinion" (Launius 2007). Even JFK tapped into public fears that the U.S. was falling behind Sputnik as part of his campaign strategy (Davis Cross 2019: 1403), and as president, he rode widespread concern about Soviet progress to fuel the U.S. toward eventually landing the first person on the moon. Between Sputnik and Neil Armstrong's step, public pressure propelled the U.S. government to create the Defense Advanced Research Projects Agency (DARPA). It is undeniably ironic that the public drove the creation of a U.S. agency tasked with some of the world's most secretive research projects. But its public legacy, though under-discussed, is equally undeniable. Over the 60 years that followed, DARPA would eventually contribute to the development of GPS, personal computers, the Internet, and COVID vaccines (*The Economist* 2021).

Throughout the 20th century, key projects emanating from the seemingly insular world of the Military Industrial Complex were galvanized through public support. Both Presidents Eisenhower and Kennedy proposed larger defense budgets than the military required due in large part to public pressure to close the so-called missile gap — the idea that the Soviet Union was developing ICBMs more rapidly than the U.S. (Licklider 1970; Wenger 1997). The idea that the U.S. was falling behind in its ICBMs was so salient that Kennedy spoke of it as a Senatorial candidate (Preble 2003). In the mid-1930s, while Britain faced uncertainty and concern that the Nazis would eventually bomb London, British foreign policymakers were constrained against stockpiling defense technologies by a public wary of economic costs (Bialer 1980) and skeptical of the need for collective security (Holman 2011). Although these technologies were distant from people's lives, and members of the public presumably understood little about the technical underpinnings of the technologies, they still influenced the trajectory of national security decisions counterfactually, for better and for worse. The U.S. may never have landed a man on the moon, and London might have built up better deterrence against the Nazis, if not for public pressure. There are important historical lessons to learn for the emerging technology and national security nexus today: public opinion is inevitably going to play some role in the next generation of emerging technologies. The more interesting question is how these technologies — and their broader technical and societal context – – may shape public opinion in different ways than previously.

1.3 How Micro-Processes Inform the Public-National Security Relationship

The micro-processes within emerging technology contexts that shape elite-public interactions are critical, since mass opinion alters the incentive calculus of the politicians they elect. In so doing, they form part of a broader theory of change that connects public attitudes to concrete policy decisions in the national security arena.

While single micro-issues rarely determine outcomes, public reactions shape agenda-setting and the feasible policy set**.** This is certainly true of elected officials — at least a meaningful subset who directly take public opinion into account (Foyle 1999), or when public opinion is activated by other actors like the media (Powlick and Katz 1998). Empirical survey evidence validates that policymakers update their preferences in response to public opinion (Peez and Bethke 2025). In this most direct theory of change, policymakers respond directly to aggregate public attitudes. This may matter uniquely in electoral contexts, especially when publics see differences in candidates' foreign policy platforms (Aldrich, Sullivan, and Borgida 1989) through selection mechanisms (Tomz, Weeks, and Yarhi-Milo 2020).

Moreover, non-elected national security officials may have strong structural incentives to consider public opinion pressures. Their positions as political appointees depend on the expectation that they pursue policies in line with an elected principal. In making foreign policy-related political appointments, there is an inherent tension between what is electorally and strategically beneficial (Malis 2024); this confluence inevitably means national security is constrained by domestic attitudes. In this theory of change, public opinion constrains both who is appointed, and how appointees build policy.

Beyond elections, aggregated attitudes shape outcomes through markets and organized interests. Public attitudes in the form of consumer preferences may shape company behavior, while public attitudes in the form of workers aggregated into unions can serve as a key constituency to which elected policymakers must respond (e.g. Jacobs and Page 2005). These patterns are plausible precisely because aggregate opinion is often stable, structured, and event-responsive (Page and Shapiro 1992), shaped by bottom-up mechanisms like social context (Kertzer and Zeitzoff 2017), and informed by general abstract notions on appropriate government strategies (Hurwitz and Peffley 1987). This implies that broader economic, social, and political variables may genuinely shape public opinion from the ground up. The findings of the dissertation are most concretely applied within a broader policy theory of change, as the variables tested in the papers generally capture broadly applicable economic, social, and political considerations. Thus public attitudes similar to those studied in this dissertation can aggregate through different

selectorates of varying scope to shape decisionmaker preferences, including in the national security realm.

Finally public opinion may have ramifications beyond elections, as the presence of audience costs in democracies may shape international crisis bargaining (Fearon 1994), including those that touch on emerging technology use in national security domains. Public opinion shapes national security outcomes in this case through the expected accountability mechanisms they provide.

These longstanding foundational mechanisms — electoral accountability, appointee constraints, market forces, and audience costs — take on distinctive characteristics in the context of 21st emerging technologies. As the next sub-section argues, today's technologies bring these mechanisms closer to individual citizens through direct personal engagement with the technologies themselves, creating new pathways through which public opinion can influence national security outcomes.

1.4 How 21st Century Technologies Bring National Security to Your Doorstep

Although emerging technologies have always been important within the public opinion-national security nexus, they are likely more important now than they have ever been. Many of today's technologies bring faraway security issues into local, and even personal contexts, making publics direct stakeholders in national security governance. 18-year-olds on TikTok now have the capacity to go to the ballot box and vote out the elected policymakers who sought to ban their favorite app, but this trend is not just about TikTok. It reflects broader trends in emerging technology with which international politics must reckon. Three areas of emerging technology — consumption, production, and experience — provide critical backdrops through which emerging technology micro processes shape broader elite-public political dynamics.

In the brave new world of 21st century emerging technology, publics are now much greater personal *consumers* of emerging technologies: the same goods that they enjoy for individual use are often deeply intertwined with national security (Vaynman and Volpe 2023). While dual-use technologies have always presented unique challenges for national security, they have proliferated in their importance for national security as individual data has become the new oil (to use an oft-deployed analogy), a critical input into frontier AI and other emerging technology applications. The most intuitive reason this consumption matters is that if you consume a product from a firm that collects data about you, this data can revert to a firm and provide the state in which the firm is located with power either directly (the state can access

the firm's data or leverage models the firm builds for national security use-cases) or indirectly (having strong firms strengthens the state — see, for example, Microsoft or Apple). But there are other key reasons consumption matters too. The more publics consume technologies from firms from a particular state, states may be able to leverage dependence on their product through economic coercion, set standards in key areas of global emerging tech governances, and entrench values in other states embedded within the technology. For this reason, where technologies come from, and how publics weigh other practical considerations like cost, is therefore important to see which states are most likely to benefit from technological consumption.

Publics not only directly consume these products, but they can also constrain the state's decisions about which technologies to incorporate into their infrastructure through public procurement: states act as consumers on behalf of the public for technologies to be incorporated into the communal sphere. While the direct role of the public is smaller in these cases than direct consumption, the stakes are potentially much higher: how the public considers economic and national security trade-offs has much wider implications for the global distribution of power. We might imagine a portfolio of national security risks tied to procurement decisions, such as driving economic dependence on an adversary state, creating large flows of data to an adversary state, or enhancing risks of foreign espionage, to name a few. While public attitudes toward international trade have long been an important area of inquiry for international relations, it is the *national security* risks connected to an individual's consumption of technology that creates unique trade-offs at both the public and policymaker level.

21st century emerging technologies have not just influenced the demand side; they have also influenced the *production* of emerging technologies with national security implications — most notably in countries trying to maintain or challenge chokepoints on irreplaceable end-use technologies or globally important intermediate products like semiconductors or critical minerals. Countries around the globe engaging in de-risking and de-coupling have brought with them publicly salient debates on industrial policy, where attempts to control and produce critical technologies are increasingly connected to great power competition, as well as debates on economic statecraft tools like export control which may protect strategic industries but induce economic harm. While countries have long produced and exported emerging technologies, both single and dual-use, global focus on the production and political geography of specific, strategically critical technologies has grown as policymakers have realized the value of dependence on global networks and weaponizing interdependence (Farrell and Newman 2019), with much of the power derived from these networks connected to the civilian private sector (Farrell and Newman 2023). These production hubs, however, have domestic foundations, and local interests can

play a critical role in shaping policies. In the UK, for example, Newport MP Ruth Jones argued against a forced reversal of a sale of a British semiconductor fab to a Chinese firm on the basis that it would threaten 600 people living in her constituency despite national security concerns in government (Deans 2022). While economic concerns around employment, taxes, and immigration policy have long been part of domestic politics and individual voter preferences, the increasingly salient national security implications of industrial policy bring security into the local and individual purview. Not only do these industrial policy issues bridge economic and security considerations, but they often have high public salience — in countries like Taiwan, semiconductors are part of the fabric of society, a point of national pride, and understood as a vital strategic resource to be protected even by non-experts. Whether to accept the financial burden to maintain technological advantages or pursue self-sufficiency is ultimately an individual decision that in aggregate can shape policy outcomes, especially when these topics are subject to partisan division or demographic divides.

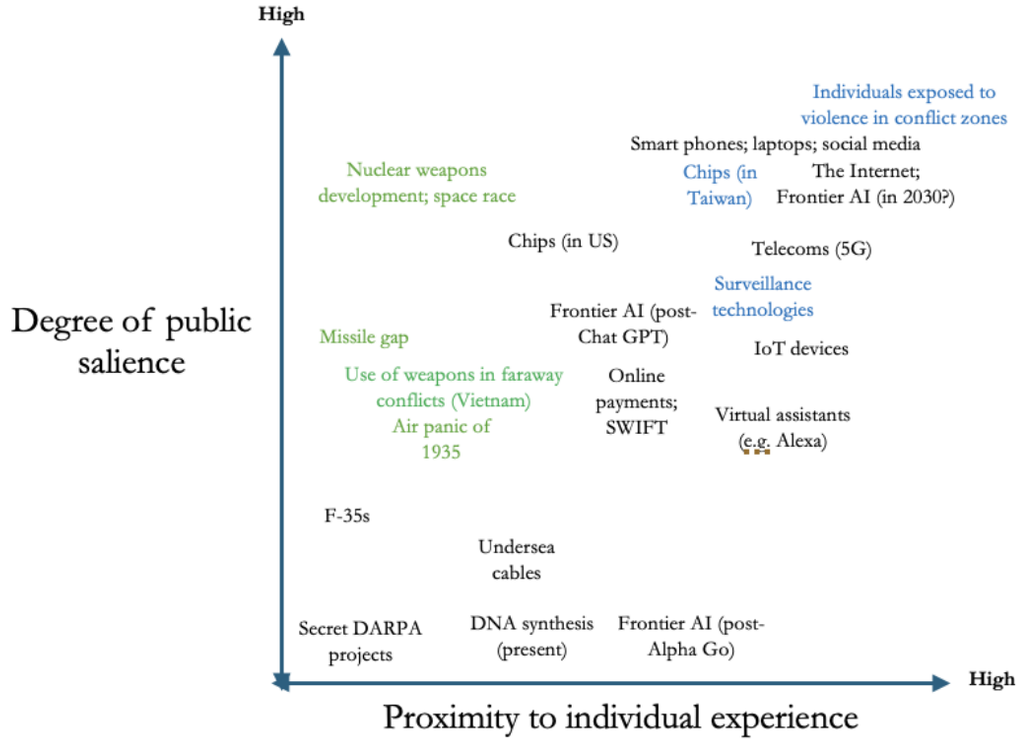
Finally, these technologies do not merely bring security from the national and international level to the individual level through dual-use concerns and the merging of national security and individual concerns, they can also transform the way individuals *experience* security. While some technologies like drones may bring publics further away from feeling the consequences of national security, other technologies may make conventional security feel more present or change the way they experience security. Improvements in offensive lethal autonomous weapons could bring more civilians into harm's way, while improvements in defensive technologies could substantially reduce or transform civilian exposure to violent conflict. Of course, new technologies can influence civilian experience of conflict beyond changes in the offense-defense balance, but these examples illustrate the potential for technologies to ultimately transform an individual's experience of conflict and, as a result, their policy preferences. In these cases, we must study *how* international security moves into the realm of individual experience, and how this relationship in turn influences policy.

Figure 1.1 maps approximately the degree to which various emerging technologies and cases — both historical and contemporary — are publicly salient and central to an individual's lived experience, with the historical 20th century cases outlined above colored green and the cases studied in the dissertation colored blue. In this case, public salience refers to the degree to which technology issues are present in public discourse, whereas proximity to lived experience captures the degree to which individuals themselves use or interact with a particular technology. These categories are naturally correlated, but they cover distinctive elements: for example, everyday citizens would have talked about nuclear weapons to a

large degree, but they would have never themselves have interacted with one in the way they do a social media platform.

While the exact location of each technology might be disputed, a clear trend emerges of differences between the past and the present. Historically, technologies were substantially less connected to individuals' lived experience than they are today because they are consumed, produced, and experienced regularly by everyday people. Across both time periods, there is also a range of cases that are sufficiently publicly salient in today's discourse that public attitudes around them could plausibly influence policy outcomes. And for individuals experiencing violent conflict, technology used to enable violence in today's world need not be dual-use to be acutely felt: it is inherently highly publicly salient and intimately tied to an individual's lived experience.

Figure 1.1: How Technologies with National Security Implications Enter the Individual Decision Calculus



These historical developments and contemporary observations motivate my research question: how do publics respond to key national security challenges defined by their emerging technology context?

In short, emerging technology brings national security closer to the individual, rendering them increasingly important national security stakeholders capable of influencing policy outcomes. Extant literature and the historical record outlined previously already highlights how publics constrain policymakers in the national security space; the purpose of this dissertation is to dig deeper and theorize and empirically analyze how emerging technology shapes the micro processes shaping elite-public dynamics in key national security domains.

1.5 Main Argument: The Micro Processes that Shape Individual Consumption, Production, and Experience of National Security

These dynamics motivate three interrelated arguments that drive this dissertation's three papers:

1. *Consumption of National Security: Publics Prefer to Friendshore Dual-Use Technologies (Friendshoring Paper)*

Unlike conventional modern strategic technologies like stealth air fighters, nuclear submarines, and aircraft carriers, many dual-use technologies — like 5G, smart phones, and navigation technologies — are simultaneously sensitive from a security perspective and contain a wide range of suppliers that create a competitive pricing dynamic. That individuals can buy these technologies for personal use brings security to the level of the individual and often requires them to make trade-offs between their security and their pocketbooks. The way publics make these trade-offs, I argue, follows a logic of *alliance-based price elasticity*: publics are much more sensitive to price changes when considering trade with an ally but are relatively inelastic in their preference for purchasing domestic technology when the alternative is an adversary, reflecting a friendshoring logic toward their preferences for dual-use technologies. Using a novel survey experiment exploring British attitudes toward incorporating American and Chinese video cameras into public spaces, I show that whereas offering a 50 percent discount on Chinese dual-use technology resulted in a 7 percent decrease in the probability the respondent preferred buying British technology, offering American technology as the foreign technology alternative resulted in a 21 percent decrease in the probability the respondent preferred buying British. Thus, ally-adversary dynamics induce publics to securitize dual-use technologies from adversarial countries but resort to market logics for technologies from friendly ones.

2. *Production of National Security: Publics Are Willing to Pay More to Protect Critical Technology When Challenged by Adversaries (Chips Paper)*

States have realized that producing emerging technologies can create networked dependencies that provide them with power in the international system. However, maintaining these emerging technology chokepoints is costly, economically or otherwise, raising the question of whether publics are willing to bear the costs. Willingness to pay is shaped by both external and internal threats: externally by countries competing to develop superior technology and internally by the possibility of partisan division and generational differences in preferences. This is especially true of states possessing strategically critical technologies and precarious geopolitical realities, as Taiwan does with semiconductors amidst heightened cross-Strait tensions. Using a novel survey experiment that exposes Taiwan-based respondents to varying semiconductor arms racing scenarios, I illustrate that Taiwan's public is willing to endure substantial increases in the cost of living to impose export controls in the face of PRC semiconductor development efforts, with exposure to PRC tech competition increasing the probability a respondent is willing to endure a 10-percent price increase by 7 percent. However, this willingness to pay faces internal fractures, with KMT voters 27 percent less likely to be willing to endure the price increase than DPP voters, and

younger voters (aged 20-29) 11 percent less likely to endure the costs than older ones (70+). From a public opinion perspective, therefore, the greatest threats to Taiwan's so-called Silicon Shield may come from the inside, not the outside.

3. *Experience of National Security: Anti-Missile Defense Technologies Have Transformed the Civilian Experience of Violence, But Violence Exposure Still Drives Hawkishness*

Lastly, emerging technologies transform the experience of security, specifically transforming individual lived experiences of violent conflict. Improvements in anti-missile defense technologies reveal that exposure to violence — arguably the most important way IR scholars have traditionally conceptualized security affecting the individual level — has been overly focused on material measurements of violence exposure. Instead, these defensive technologies may be shifting the individual experience of violence from a predominantly material experience to one defined by the expanded role of psychological factors: uncertainty and trauma. The evolution of the Israeli experience of violence between 2008 and 2014 reflects this transformation: the widespread proliferation of and improvement in the capabilities of the Iron Dome anti-missile defense technology created an environment in which deaths, injuries, and property damage were greatly reduced compared to previous conflicts. The Israeli civilian experience in the Iron Dome era, I argue, challenges the exclusive centrality of material violence, and instead reveals three distinctive mechanisms through which civilians experience violence: material violence, uncertainty, and traumatic triggering — each of which brings a different security threat on the individual level and demands a different counter-terrorism policy on the national level. I leverage geospatial data and as-if-random variation in the distribution of sirens during the 2014 Israel-Gaza War to test the implications of my theory. I illustrate siren exposure was associated with statistically significant localized increases in hawkish policy support across a range of measures. Thus, even when violence does not cause material damage, it could cause psychological damage through fear and disruption. These non-material mechanisms are likely to become more salient with further technological improvement in defense systems, suggesting that the role of uncertainty and traumatic triggering may expand further in conflict.

1.6 Methodology and Case Selection

Methodologically, each paper in the dissertation marries rich quantitative survey data with finer-grained observations and interviews from the countries I studied. I rely primarily on quantitative survey data to study public opinion, using a combination of quasi-experimental and experimental methods. However, the analysis of the results and their implications, as well as the quantitative research designs, were built

on deep engagement with the policy ecosystem in each of the countries I studied. During my DPhil, I spent three years in the UK holding regular conversations with China-facing policymakers, one year in Taipei engaging with policy stakeholders and members of civil society, and multiple previous years engaging with Israeli policy and interviewing Israeli national security stakeholders.[3] In all three countries, I utilized language skills, including professional fluency in the UK and Taiwan cases, to complete my research. This in-depth engagement allowed me to design survey experiments that were sensitive to local dynamics, understand the policy implications of my work, and better articulate the scope conditions for my theories.

The specific topics of each article were motivated by theoretical, methodological, and empirical considerations designed to cover key theoretical dimensions of interest and build a robust understanding of important emerging technologies, AI development hubs, and policy ecosystems. Theoretically, each case served as a ripe environment to build generalizing, appropriately scoped theories likely to apply to other geopolitical and technological contexts. Methodologically, potential cases had to meet three conditions: high availability of survey data, high availability of and access to elite interviews, and at least basic (and ideally fluent) knowledge of the primary language used in the environment of study. Israel, the UK, and Taiwan all have highly reputable survey providers and have relatively transparent and open access to policymakers, and I had at least basic language skills in all three contexts in which I operated.[4] Third, potential cases were screened for having at least medium levels of public salience of a national security risk, an important ongoing conflict (violent or non-violent), and a technological and policy ecosystem important for AI development. The fulfillment of these factors suggests my cases were ripe environments for theory testing.

Surveys and survey experiments are imperfect but useful tools for understanding how the public might ultimately constrain national security policies. The data captured in public opinion surveys is unlikely to tell us in absolute terms how much Americans would be willing to pay to stay ahead of China for frontier AI, for example, nor will it tell us whether Dutch leaders considered public opinion when they levied multilateral export controls on the PRC. There are also case-specific elements in each of the three papers that are unlikely to generalize. Israel is arguably uniquely frequently exposed to repeated incoming rocket fire and possesses uniquely strong defensive capabilities, indicating that many context-specific variables

[3] While it was not possible to travel to Israel for fieldwork first due to the Coronavirus pandemic and then due to the ongoing Israel-Hamas conflict, I relied on Zoom interviews with both local and national level policymakers, in conjunction with multiple previous experiences in Israel, to contextualize my results.

[4] In two of the environments I performed research, the UK (English) and Taiwan (Mandarin Chinese), I possessed native or high level of linguistic fluency. In the Israeli case, where my language skills were significantly more basic, I conducted relevant background interviews in English, which is commonly used in policy circles.

may not generalize. In the Taiwan case, TSMC plays a unique role as a company with a monopoly over a critical emerging technology in a geopolitically volatile region.

The utility of these surveys, however, comes from observing general trends that inform how publics think through trade-offs and leveraging unique case context to understand generalizable phenomena. Survey data can reveal divisions within a state on important policies, leading to the possibility of issue polarization; they can reveal general support or opposition toward conflicting policy options, such as whether to go to war; and they capture attitudes toward a range of international actors, including critical questions connected to economic dependence. Meanwhile, the specific contexts of cases limits generalizability in specific areas: for example, the Israeli population may be uniquely predisposed to hawkish attitudes. Nonetheless case-specific variables offer useful pathways to generalizing in other domains. It is precisely because Israel was uniquely frequently exposed to violence but without material harm that a theory of non-material mechanisms could be isolated and built out and applied to cases where the material/non-material harm binary is less divided. Thus, while the data elected leaders access can vary significantly in granularity and context, these survey experiments offer a useful method to build and test theories around factors that could ultimately constrain policymakers.

1.7 Contributions

Taken together, this dissertation highlights how emerging technology contexts shape the ways in which publics respond to national and international security issues, focusing on the micro processes through which technology mediates political dynamics. In terms of consumption, I provide a novel typology highlighting the overlap between everyday goods and traditional critically sensitive technologies in dual-use cases, underscoring the need to study public preferences toward the economic-security trade-offs in this distinctive domain of technologies. I highlight the unique role dual-use technologies play in bridging personal incentives and national security considerations, showing that the public engages in a friendshoring logic when making critical public-facing trade-offs between national security and individual priorities like pocketbook voting, findings that are likely to travel to a range of technological and geopolitical contexts. From a production perspective, I illustrate how the production of strategically critical technologies and associated theories like weaponized interdependence, which has heretofore been studied only structurally, has critical domestic foundations, positing three potential mechanisms in the form of tech competition, polarization, and age-based demographic change that could shape public opinion on chokepoint maintenance and public willingness to accept cost of living increases. Finally, in the case of experiencing national security, I highlight that when individual experience and security are

intimately linked — through the lived experience of violent conflict — emerging technology can transform the way violence is personally experienced, with the proliferation of non-material mechanisms demanding a reconsideration of best practices in counter-terrorism strategy.

This work seeks to contribute not just to concepts and theory, but also to methods and empirics. Exclusively from an academic purview, the two survey instruments I develop to study consumption and provide a blueprint for further study in these areas. The datasets collected through this process offer clear pathways for further quantitative analysis. Specifically, my survey on Taiwanese attitudes in the face of global semiconductor competition offers important empirical data that could be used beyond the narrow scope of the papers in this dissertation, potentially forming the foundation of a broader stream of work that explores the how public attitudes toward tech firms facilitate micro processes that inform macro geopolitical dynamics.

The dissertation's empirical cases were chosen not just for their theoretical appropriateness, but because they are areas of urgent policy focus. Governments, including the UK and others like the U.S., are reckoning with whether and how to regulate procurement and foreign ownership over critical technologies in scenarios similar to the one I model — such as through the UK's Procurement Act or the U.S.' Protecting Americans from Foreign Adversary Controlled Applications Act. My survey provides a key barometer of what and how the public thinks — through a friendshoring logic motivated by protectionism as opposed to acute understanding of technical risk — at a time of important legislative action. In Taiwan, publics are considering how much to support its domestic semiconductor industry as both allies and adversaries are seeking to onshore capabilities and faces the threat of an invasion by the PRC. In Israel, as war with Hamas rages on — the analysis provided in the sirens paper illustrates the domestic public pressures to engage in war that get triggered when in Israel when sirens ring anew, as they have thousands of times following October 7. My analysis of the pressures shaping these important events offers useful insights that might allow for prediction of future responses to threats.

Based on this dissertation's findings, it is easier to imagine a world in which public opinion in the emerging technology space causes policymakers to create less favorable national security policies — after all, public beliefs may ultimately influence the direction of emerging technology development and regulation (Frewer, Howard, and Shepherd 2011; Otway and Von Winterfeldt 1982), with key implications for national security. If the friendshoring paper — which finds that public understanding of risks from emerging technology is grounded more in economic protectionism toward adversaries as opposed to specific technical risk pathways — is any indication, friendshoring logics could be taken to

an extreme, driving economic decoupling in areas spanning far beyond the small yard in which technologies are currently restricted. The chips paper suggests that partisanship could threaten to undermine the key backbone for Taiwan's economic deterrence. And the potential power of non-material mechanisms as an alternative source of hawkish attitudes could suggest that politicians have strong incentives to prolong wars even in the absence of rockets falling, creating cycles of violence and calls to continue military activity as we have observed in the most recent Israel-Gaza conflict. Together, they suggest that the realists who thought national security policy should be developed far away from the public eye might have understood the risks with incorporating public input into critical national security decisions.

Equally, however, this dissertation also points to a world in which the public operates as a source of domestic strength, resilience, and accountability in the technical field of emerging technology governance. It also suggests that individual lives can be improved by understanding how publics think about trade-offs in the national security domain and respond to technology-induced changes in their experience of security. The chips paper, for example, highlights the resolve of Taiwan's public to fight to maintain strategic technological advantages amidst the threat of adversarial tech competition and, in the background, the prospect of invasion. The siren paper points to the opportunity to strengthen counter-terrorism by highlighting that incentives to engage in violence could be decreased by attacking the source of non-material mechanisms, reducing the burden of Iron Dome and other anti-missile technologies and focusing on identifying the sources of missile stockpiles in supply chains. And of course, in countries that seek public input as a core input into their governance processes, public opinion on the most pressing problems of our time *should* matter as one important input into governance.

Policymakers around the world — especially elected legislators and executives — should carefully consider both these perils and promises and use this understanding to inform how to traverse the technologically induced individualization of security, especially as frontier AI threatens to amplify these findings and raise the stakes of development, deployment, and regulation of emerging technology. The frontier of AI, of course, will be consumed by global users in a range of dual-use contexts, presenting a range of risks, including from those who use alliance heuristics to make policy prescriptions around supply chain dependencies. AI will be produced by countries seeking to carve out their own networks of dependencies along with changing geopolitical dynamics and the prospects of local and global war, with the public potentially enabling or constraining efforts to build industrial capabilities. Our theories of political violence will need to reflect AI's transformations to the offense-defense balance. Finaly moving the study of emerging technology and national security to the micro processes at the individual level,

creates critical avenues for further research, such as studying where the public thinks red lines on AI actions should be drawn to avoid catastrophic risks, understanding the implicit threat models that shape their geopolitical concerns and subsequent willingness to coordinate on AI monitoring regimes, how geopolitical risks shape preferences for open or closed models and model weights, and the extent to which the desire to achieve general intelligence drives an arms race that spills across geopolitics. Each of these pathways of inquiry requires individuals to consider whether the benefits they themselves could reap are worth potential national security harms and vice versa.

1.8 Structure of the Dissertation

This dissertation is structured into six chapters. Chapter two reviews the current literature and develops a new research agenda that considers the role of emerging technology within the public opinion-national security nexus. It specifically highlights public opinion has shaped historically shaped critical outcomes in emerging technology and national security, contemporary factors that make the area fruitful for study, and locates extant building blocks for future further research, with implications for research on public opinion on AI in the national security domain. Chapters 3 through 5 feature the three papers encompassing the body of this dissertation. Each paper is designed to be read on its own and is optimized for internal logic and flow. Nonetheless, each speaks to the dissertation's holistic central focus on how emerging technology changes the relationship between national security and public opinion, and each shines light on potential future directions for structured research at the national security-emerging technology intersection. This research's broader implications and most promising avenues for further research are discussed in Chapter 6, which brings the project to a conclusion.

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Chapter 2

How Emerging Technology Changes the Relationship Between Public Opinion and National Security

Abstract

This review article underscores the need to develop a new research agenda that considers the role of emerging technology within the public opinion-national security nexus. While extant literature makes clear that public opinion can and should influence national security outcomes under certain conditions, emerging technologies have been problematically omitted from the discussion despite their historical and contemporary relevance. While public opinion has always shaped emerging technology national security policy, security issues have been brought closer to the public eye as individuals have become intimately connected to the consumption, production, and experience of 21st century emerging technology. I conclude by proposing a research agenda for further research on public opinion, national security, and emerging technology that addresses the novel national security and foreign policy challenges posed by the development, deployment, and regulation of artificial intelligence.

How Emerging Technology Changes the Relationship Between Public Opinion and National Security[1]

"When the Soviet Union comes to the point of being able to reach the United States with modern weapons of destruction, the period of short-run American security will have run out. The psychological mechanisms will have produced a certain overt complacency in a world hardly suited to this mood will no longer control. Public opinion unprepared for the power game with such prohibitive stakes may either force premature decisions or delay timely ones."

– GABRIEL ALMOND, *THE AMERICAN PEOPLE AND FOREIGN POLICY,* 1960

2.1 Introduction

Gabriel Almond's seminal work, *The American People and Foreign Policy*, is canonical within political science and IR for its foundational role in theorizing on the role of public opinion within foreign policy. Almond's work, in conjunction with prior work from Walter Lippman, formed a nearly half-century-long consensus within political science and international relations (IR) literature on the role of public opinion in foreign policy. The three core tenets of the so-called Almond-Lippmann consensus, as articulated by Holsti (1992: 439), suggested that public opinion 1) is volatile and thus a poor foundation for "effective foreign policies," 2) lacks "coherence or structure," and 3) has little influence on foreign policy outcomes. Many canonical realists, including Hans Morgenthau (father of classical realism) and George Kennan (father of containment) articulated visions of public opinion that echoed the core tenets of the Almond-Lippmann hypothesis (Holsti 1992: 443), with the Almond-Lippmann hypothesis becoming deeply entrenched in IR, despite slow-mounting challenges.

[1] I am grateful to Julia Carver, Dominic Johnson, Sam Seitz, and discussants at the Oxford International Relations DPhil seminar for their feedback on this paper. Some content from the introduction chapter is repeated verbatim here for the purposes of developing an independent literature review chapter.

While many IR scholars are familiar with the beginning of Almond's work — the most important in public opinion at the time it was written (Holsti 2004: 26) — far fewer are familiar with how it ends: a call to carefully consider the role that public opinion could play in responding to emerging technology-induced national security risks. Writing from the backdrop of the usage of nuclear weapons and the possibility that these technologies could be used against the United States, Almond wrote:

> "When the Soviet Union comes to the point of being able to reach the United States with modern weapons of destruction, the period of short-run American security will have run out. The psychological mechanisms will have produced a certain overt complacency in a world hardly suited to this mood will no longer control. *Public opinion unprepared for the power game with such prohibitive stakes may either force premature decisions or delay timely ones*" (Almond 1960: 243, my emphasis).

This review article explores the implications of Almond's under-discussed and under-explored insight: public opinion can be a critical variable that shapes national security, especially in emerging technology.[2] While IR has made significant strides in developing theories that speak to the important role public opinion plays in foreign policy and national security, its connection to emerging technology-related risks is largely neglected. This is especially problematic because emerging technology issues challenge some of the foundational assumptions we make about public opinion and foreign policy, especially for 21st century technologies: the consumption, production, and experience of emerging technology brings security issues from the national and international level to the individual level.

Public opinion is not just theoretically important for emerging technology national security policy, it is also increasingly accessible for scholarly inquiry thanks to rapid methodological advancements. The proliferation of widely accessible customizable, diverse survey provision (Berinsky, Huber, and Lenz 2012 in Kertzer 2023: 448) which have dramatically reduced the costs of survey provision outside of the United States position IR well to leverage more advanced survey instruments have been deployed to improve public opinion theories on national security across a range of geographic contexts.

While emerging technologies have long been important variables linking public opinion to national security and foreign policy outcomes, the rapid development and diffusion of increasingly powerful

[2] In this dissertation, emerging technology national security risks refer both to risks that are directly induced by the development and diffusion of emerging technologies, as well as fundamental shifts in the nature of existing national security risks as a result of emerging technology. For a discussion on important conceptual factors in defining security, see Baldwin (1997). For a discussion of the importance of considering non-military security, see, for example, Ullman (1983).

foundation models and broader AI capabilities may bring this triangle to especially time-sensitive relevance and importance. Learning the right lessons from previous technological engagements with the public opinion-national security nexus — both in terms generalizable implications from previous examples and research design techniques to study — will be critical to study AI at a uniquely important juncture in its development.

This public input has the potential to be positive in some areas of emerging technology national security governance and is normatively important. Powlick (1991: 634) writes in the U.S. context that "there is a surprisingly widespread view among foreign policy officials that public input into, and even to some extent influence on, the foreign policy process is both necessary and desirable." Moreover, The White House Emerging Technologies Interagency Policy Coordination Committee (ETIPC) has argued that public participation in emerging technology governance "is important for promoting accountability, for improving decisions, for increasing trust, and for ensuring that officials have access to widely dispersed information" (Holdren, Sunstein, and Siddiqui 2011).

There are critical stakes and lessons to be learned for the next generation of emerging technologies, including frontier AI and the future possibility of artificial general intelligence (AGI). As policymakers navigate possible domestic constraints on AI national security regulation, the possibilities of global arms races, the diffusion of AI into a range of powerful technologies, including with military applications, academic IR should lend its insights to policy to ensure AI is developed and regulated in the national security space in a safe, democratic, and transparent manner, reflecting both the opportunities and risks posed by AI.

This paper proceeds in four sub-sections, building the overarching argument that public opinion has been — and will continue to be — critical for foreign policy and national security issues, especially so for those that intersect with emerging technologies. **Section 2.2** makes the general argument that, in contrast to the field's early thinkers, public opinion has long been important for national security outcomes in the emerging technology space, shaping both policymaker selection and responsiveness (Tomz, Weeks, Yarhi-Milo 2020). **Section 2.3** extends the argument from the previous section to argue that public opinion is likely to be especially important for 21st century technologies, which bring national security considerations to the individual level through consumption, production, and experience. Extant literature in international security, international political economy, and public opinion has begun to engage with these themes, but structured study is needed. As **Section 2.4** contends, building this structured research will be especially important as frontier artificial intelligence increasingly diffuses into

public life. While research has begun to address the public opinion-national security-AI nexus, the consumption, production, and experience framework provides a structured way to advance further study. Finally, **Section 2.5** briefly summarizes the key arguments and concludes.

2.2 Why Public Opinion Matters for National Security Outcomes

It has been a long road for a field whose preliminary thinkers — predominantly classical realists — insisted that international politics "is a professional activity that is not—or should not—be responsive to the ill-informed whims of the voting public" (Payne 2023: 3). They instilled a nearly half-century long consensus — the Almond-Lippmann consensus — that public opinion does not and should not matter for foreign policy, resulting in the popularization of the saying "voting ends at the water's edge" (Aldrich et al. 2006). The Almond-Lippman consensus was espoused and promoted by some of international relations' most influential thinkers in theory and practice. Here is a small sampling. Hans Morgenthau, whose thinking would shape contemporary international security studies (Crawford 1991: 293), wrote in his iconic *Politics Among Nations* that, "The harmony between foreign policy and public opinion may well have been achieved at the price of surrendering the principles of good foreign policy to the unsound preferences of public opinion" (Morgenthau 1978: 159). George Kennan, the father of the theory of containment, saw publics as easily susceptible to extreme ideas and a breeding ground for special interests (Kennan 1951: 61-2). Thomas Bailey described "the dangers of flying in the face of public opinion," arguing that US presidents, including Theodore Roosevelt, James Polk, and Franklin Delano Roosevelt, had strong incentives to resort to deception to curb public opinion (Bailey 1948: 8). Lippmann himself, who by the 1950s was the United States' most influential political columnist (Holsti 2004: 32), warned of "excess of democracy", "misrule by the people", and "a dangerous master of decision when the stakes are life and death" (Lippmann 1955 in Holsti 2004: 32-3). Their influence was so lasting that in their 1989 review of public opinion literature, Aldrich, Sullivan, and Bordiga (1989) write, "most research on the 1984 election treats foreign policy lightly or ignores it altogether" (123-4) and that the election was clearly a reflection of economic voting (Light and Lake 1985: 94, cited in Aldrich, Sullivan, and Bordiga 1989: 124). Intuitively, the emerging technology sub-field of national security — often defined by its technicality, opaqueness, and inaccessibility — is among the areas some might expect to have been and should continue to be kept distant from the public purview.

IR has made substantial theoretical and methodological strides in establishing that public opinion matters for national security, maturing rapidly thanks to both theoretical and methodological advances in the

field (Kertzer 2023).[3] We know now that national security stakeholders are theoretically responsive to domestic audiences and international events (Putnam 1988), and scholars debate whether public opinion is formed predominantly through "top-down" (e.g. Zaller 1992; Guisinger and Saunders 2017) or "bottom-up" mechanisms (e.g. Kertzer and Zeitzoff 2017). Regardless of the public opinion model, to ignore foreign policy as a key factor for voters, and thus national security decisions, as many scholars once did (Aldrich, Sullivan, and Bordiga 1989: 123-4), is clearly a theoretical oversight, challenging "the long-dominant, made-in-the-USA paradigm in IR, neorealism" (Baum and Potter 2015: 4).

The constraining role of the public on key foreign policy and national security outcomes is increasingly documented within the literature. Liberals have long observed that democracies do not fight each other (but do fight non-democracies), motivating democratic peace theory (e.g. Doyle 1986; Oneal and Russett 1997). Importantly, democratic peace has public accountability foundations; for example, expanding voting to women, who generally are less supportive of using force in conflict, may impose greater costs on leaders seeking to engage in conflict and thus partially explain why democracies do not fight each other (Barnhart et al. 2020).

The electoral accountability provided by democratic publics significantly shapes national security outcomes. For example, because democratic leaders are theoretically more responsive to their audiences, democratic leaders can make stronger commitments in crisis scenarios than non-democratic ones (Fearon 1994).[4] These audience costs may vary according to the electoral calendar (Chiozza 2017), further highlighting the constraining role of the public. These questions around credible commitments are reflective of the broader role public opinion plays in shaping resolve (Kertzer 2016). In other cases, leaders' reputations and public accountability provide novel opportunities to implement policies that oppose their established political reputation, such as a foreign policy hawk — in contrast to their expected behavior based on reputation — pursuing a peace deal with a foreign policy rival. This class of mechanisms, known as against-type models, is perhaps best encapsulated by the title of Cukierman and Tommasi (1998)'s foundational work on the topic: "When Does It Take a Nixon to Go to China?"[5] In each of these models, public opinion considerations shape how national security policy is carried out; what remains uncertain, however, is whether these theories also apply to the uniquely opaque world of emerging technology national security policy.

[3] For a full and comprehensive overview that has directly inspired the survey of literature for this section, see Kertzer (2023). For a review of the literature linking mass preferences to policy, see Canes-Wrone (2015).
[4] For a key public opinion test of audience tests, see, e.g., Tomz (2007) and Trager and Vavreck (2011).
[5] See also: Briscoe and Safford (2008) for an application to firms; Mattes and Weeks (2019).

2.2.1 Selection and Responsiveness in Emerging Technology Policy

Extant literature makes clear that public opinion shapes national security outcomes because it constrains leaders' decisions; whether these constraints touch emerging tech policy remains unexplored. To understand the nature of these constraints and whether they apply for emerging technology, I argue two core public opinion mechanisms — responsiveness and selection — clearly connect the public to key elements of the national security establishment (Tomz, Weeks, and Yarhi-Milo 2020).[6] In the case of responsiveness, elected heads of government and other key national security stakeholders consider public preferences and make electoral calculations when making national security decisions. For selection, publics select candidates, at least in part, based on their national security platforms. The historical record suggests that emerging technology national security policy has been shaped by both mechanisms.

Responsiveness: Elected heads of government face a dual mandate: to formulate national security policy and to win over enough voters to win elections (Payne 2023). While the worlds of elections and national security policy were initially theorized to be distinctive — most famously by Wiladvsky in his so-called two presidencies thesis — (Widavsky 1966), the empirical reality across nearly a century of elected leaders suggests electoral politics often infiltrates the national security space. The lines certainly blurred in 1939 for U.S. President Franklin Delano Roosevelt, who received access to polling data on attitudes toward potential U.S. intervention (Berinsky 2009: 34). In Graham Allison's analysis of the Cuban Missile Crisis, he attributes John F. Kennedy's decision to pursue a blockade of Cuba as partially a domestic political calculation. He cites then-U.S. Secretary of Defense Robert McNamara remarking on the crisis, "It's not a military problem we're facing. It's a political problem" and Robert Kennedy reflecting on the blockade choice, "Well there isn't any choice. I mean, you would have been, you would have been impeached" (Allison and Zelikow 1999: 113). And amidst ongoing war in Vietnam, U.S. President Richard Nixon requested polling data on specific foreign policy issues, as opposed to broader survey results (Druckman and Jacobs 2006). President Nixon famously went to great lengths to secure re-election — just ask Watergate-breaking reporters Carl Bernstein and Bob Woodward — but his efforts spilled into the realm of international conflict. When formulating his South Vietnam policy in 1972, following the Democratic nomination of George McGovern, Nixon famously remarked to his Secretary of State Henry Kissinger that, "we also have to realize, Henry, that winning an election is terribly important" (Schwartz 2009: 174; Payne 2023: 1). The cases of FDR, JFK, and Nixon collectively

[6] Public opinion specifically matters both qualitatively — insofar as critical foreign policy stakeholders consider public attitudes when they make decisions — and quantitatively, with stakeholders receiving briefings on public opinion data and elections potentially being decided at the margin on foreign policy.

highlight strong direct consideration of public opinion pressures — including those in which public tides pushed against foreign policy stakeholder impulses — with more contemporary work illustrating public opinion pressure shaping U.S. policy in contemporary conflicts like Iraq (Payne 2019, 2021, 2023). Instead of debating whether public opinion matters, the field has moved to more challenging questions surrounding *when* and *why* public opinion matters.

Emerging technology issues in the national security sphere have long observed these selection effects, with public opinion historically operating as a critical variable shaping technology policy and international politics (Dafoe 2018: 39). In the years before German appeasement, British foreign policymakers — who wanted to build up their defense against German aerial threats — were constrained by a public weary of economic costs (Bialer 1980) and the need for collective security (Holman 2011).Following the Soviet launch of Sputnik, U.S. policymakers were pushed toward creating the Defense Advanced Research Projects Agency (DARPA) and racing to land a man on the moon (Launius 2007). The public pressure was so strong that JFK using Sputnik as part of his campaign strategy (Davis Cross 2019: 1403). Elsewhere, both Presidents Eisenhower and Kennedy, proposed larger defense budgets than the military required due in large part to public pressure to close the so-called missile gap (Licklider 1970; Wenger 1997). A younger Senator JFK even campaigned on it in Congress (Preble 2003). In these cases, emerging technology policy was not isolated by public opinion, but deeply shaped by it.

Selection: While economic factors may play a disproportionate role in influencing voting behavior,[7] they do not have a monopoly — or even necessarily the largest pull — on everyday people's voting decisions, especially when considered in a global context. As Levin and Trager (2019: 353) highlight, the idea that publics are ill-informed on foreign policy is US-centric, whereas publics in Western Europe, Eastern Europe, the Middle East, North America (excluding the U.S.), and sub-Saharan Africa were all substantially more informed on international governance issues than Americans. In many polities like Israel and Taiwan, national security issues have traditionally been the most important and serve as critical divisions among parties. Even in the United States, where foreign policy and national security decisions are thought to be more distant, foreign policy and international security issues can be especially salient: Vietnam was the most pressing policy issue during the Nixon administration (Mueller 1973), while democratic constraints shaped U.S. involvement in Vietnam, Nicaragua, the Gulf War, and Bosnia

[7] For example, Kramer (1971) — the seminal work linking macroeconomic outcomes to voting behavior (Mueller 2003: 429) — argued that most variation in incumbent success could be attributed to measures of economic performance (Kramer 1971). Other authors have pointed to variables like partisanship, an individual's socioeconomic condition, and macroeconomic currents (Friedman 2023: 3).

(Sobel 2001). Activities short of voting, such as protesting foreign policies or even posting on social media, can inform discourses that ultimately contribute to foreign policy decisions.

Even if the importance of foreign policy on elections pales in comparison to that of domestic factors — and it is not clear that it always does — small swings in public opinion on foreign policy issues can be enough to shape the outcomes of elections. Foreign policy issues do not need to be the most salient to be important; for example, the 2006 U.S. midterm elections revealed that the effects of faraway conflicts are felt locally, influencing national Congressional elections (Gartner and Segura 2006). Moreover, as Friedman (2023) notes, foreign policy may only shift electoral outcomes by a couple of points, but this can be sufficient to change elections. In the 2020 U.S. election, for example, Joe Biden won Arizona, Georgia, Pennsylvania, and Wisconsin by fewer than 1.5 percent each, while Donald Trump won North Carolina by 1.3 percent (New York Times 2020). 1-to-2-percent swings are sufficient to completely change electoral outcomes for the United States' most important national security decisionmaker.

Critical emerging technology issues with national security applications have been critical for voters. For example, *98 percent* of Americans had heard of an atomic bomb in 1946 — an extraordinarily high rate of familiarity compared to other events of global importance (Almond 1960: 69). While fewer respondents believed atomic bombs were the most important issue facing the country at that time, the salience of emerging technology in the case of atomic bombs sets an important precedent for thinking about future emerging technology-related risks. This does not necessarily imply causality, but issue salience correlates strongly with the likelihood that individual issues will matter for foreign policy. Issue-specific voting is more likely to be prevalent as issues become more salient (Druckman and Jacobs 2006). How the public thinks about and votes based on issues around emerging technology in the national security space, at the very least, warrants far more academic inquiry than it currently receives. Taken together, the historical record provides compelling evidence that emerging public opinion shapes national security decisions, including in the field of emerging technology.

2.3 How 21st Century Emerging Tech Changes the Public Opinion-National Security Status Quo

Among national security issues, those touching emerging technology might seem to be the least publicly accessible, probably invoking an image of a secret MI6 James Bond hideout more than an image of your neighborhood hardware store or your neighbor's patio. What is unique about emerging technology in the 21st century is that *both types of technologies matter:* emerging technologies bring national security issues to

the individual level, specifically through the consumption, production, and experience of emerging technologies with security implications.

2.3.1 Consumption

Emerging technologies blur the lines between private and public interests, with technologies consumed for personal enjoyment also critical for national security. International relations initially discounted the salience of national security issues for voters precisely because they were perceived as distant from private life. For example, Almond argued that most Americans had little incentive to learn about foreign policy because it was irrelevant to their career prospects (Almond 1960: 54). Campbell et al. (1960) argued voters become interested in policy when they "intrude upon private life — when they become 'doorstep issues'" (Kinder and Kiewiet 1981: 131).

However, many of the technologies that present challenges for governance today are, to use Kinder and Kiewiet's phrase, doorstep issues. Unlike technologies like nuclear or chemical weapons that felt distant from people's lives, many of the most critical technologies today are used commercially — including by private individuals — and have secondary uses that threaten national security (Vaynman and Volpe 2023).[8] These *dual-use technologies* — those with an intended or primary use but with potential additional applications that could induce harm (Forge 2010) — put individual's private lives in direct contact with the government national security apparatus, specifically for technologies with political, security, military, and intelligence applications (Mahfoud et al. 2018).[9] The TikTok case represents a key case-in-point: its primary mission is to "inspire creativity and bring joy" (TikTok 2023). But concerns around its potential to influence political debates and for the Chinese government to access American data prompted the bipartisan passage and signing of H.R.7521 — The Protecting Americans from Foreign Adversary Controlled Applications Act — could result in the future in the government banning a technology used by over 170 million Americans (Maheshwari, McCabe, and Karni 2024). In other global contexts, those in third countries face choices between buying Apple and Huawei cell phones, Fitbit or Xiaomi fitness watches, and Tesla and NIO electric vehicles, shaping the demand side for each of these technologies. In short, dual-use technology renders classic "guns and butter" trade-offs (Poast 2019; Powell 1993) individually significant decisions, further blurring the already gray lines between international security

[8] Dual-use technologies have long been important for national security, but the growing importance of civilian IT firms for national security has raised further debate on whether the technological private sector should be regulated (Carrozza, Marsh, and Reichberg 2022: 7). For a robust discussion on the US tech private sector, see Nizza (2024).
[9] Many contemporary definitions define dual-use as a technology with both civilian and (exclusively) military applications; I opt for this definition to capture the broader range of state actors that could leverage civilian technology to induce harm.

and international political economy (Nye and Lynn-Jones 1988: 25) and the long-standing trend of economic issues proliferating into the security sphere (Sigelman 1979: 1197) relevant for public opinion.

The consumption choice makes the oft-asked question on the relationship between alliance dynamics and trade (e.g. Gowa 1989, 1995; Gowa and Mansfield 1993, 2004; Mansfield and Bronson 1997; Mansfield and Pollins 2003) not just a question pertinent to national policy but also individual preferences for trading between allies and adversaries. Individuals must navigate concerns about the negative security externalities or positive economic benefits associated with trade (Carnegie and Gaikwad 2022), as well as potential economic and privacy trade-offs, creating a bundle of risks tied to emerging technologies which are often multi-faceted (e.g. Luo et al. 2010). How different groups understand disruptive emerging technologies has widespread implications that need to be studied (Bao et al. 2022).

This consumption can occur on both the individual and government level to be significant. In the case of government consumption, individual attitudes toward procurement decisions can be a critical input into the decision on which bid to accept. In this government consumption case, the role of each individual's preference is less, but their collective impact could be greater. In each case, individuals navigate challenging trade-offs and a range of technological risks and make challenging decisions among them — what remains less clear is how individuals weigh these trade-offs in practice.

2.3.2 Production

Individuals do not just consume strategically critical technologies; they are also critical stakeholders in their production. States have long gained power having others economically dependent on them (Keohane and Nye 1987, 2001). While many scholars responding to post-Cold War globalization challenged that states were critical actors in a market-centric world (e.g. Büthe and Mattli 2011; Rodrik 1998; Schmidt 1995; Strange 1994, 1996), more recent scholarship has argued that the networks created by globalization may not only be reversed (e.g. Stiglitz 2017; Walter 2021) but also leveraged strategically (Farrell and Newman 2019), especially after the COVID-19 pandemic (McNamara and Newman 2020). The economic interconnectedness globalization had created could be harnessed for state power, creating strong incentives for states to pursue technological advantages or securitize production of especially valuable strategic resources, paving the way for "decoupling" and "derisking" discourses and policies.

IR has made substantial theoretical strides developing the strategic logic of leveraging economic dependence, especially following the diffusion of weaponized interdependence theory (Farrell and Newman 2019) across academic and policy ecosystems (Byman 2024). These development have

included: analyzing additional empirical cases (Drezner, Farrell, and Newman 2021), exploring variation in the relationship between states and firms (Gjesvik 2023), studying how control over multiple networks enhances state power (Beaumier and Cartwright 2024), explaining how countries can counter adversarial efforts to leverage weaponized interdependence (Cha 2023), making broader arguments around leveraging networks for global domination (Farrell and Newman 2023), and developing related concepts like infrastructural geopolitics (de Goede and Westermeier 2022). However, just as national security leaders consider both strategic and electoral factors when deciding how to execute violent conflict, so too must they consider the strategic and electoral factors connected with industrial policies and the production of strategically critical technologies. For example, individual concerns around cost-of-living increases and the potential for job losses can influence national security considerations. In short, technological advantages and technological chokepoints thus have domestic — and specifically public opinion — foundations which have been neglected by extant literature. These attitudes toward production have especially important implications for companies, who often play an outsized role in shaping how technology affects broader geopolitical currents.

These economic production issues are salient in contemporary politics and have demonstrably influenced elected policymakers. In the UK, for example, Newport MP Ruth Jones argued against a forced reversal of a sale of a British semiconductor fab to a Chinese firm on the basis that it would threaten 600 people living in her constituency (Deans 2022). In a March 2024 U.S. congressional hearing on the Chinese Communist Party's threats to U.S. biosecurity, discussions on national security concerns were grounded in local concerns on both sides of the aisle, such as Congresswoman Shontel M. Brown (OH-11) then touting the emerging technology expertise of the Cleveland Clinic Foundation and Case Western Reserve University; and Dan Newhouse (WA-04) mentioning his role representing the Hanford Nuclear Site and the Pacific Northwest National Laboratory (NTD 2024) — rhetorical demonstrations frequently displayed in Congressional settings. These cases reveal that the production of strategic technologies is subjected to local pressures, such as from employees in key firms.

Like individual consumption of emerging technologies, individuals can influence production both through their individual actions and by acting with others. Individuals can invest in stocks for firms producing critical technologies, and skilled workers at strategically important firms can immigrate to other countries. In aggregate, individual preferences for industrial policies, or for measures that seek to protect technological advantages like export controls, can shape policy preferences. International relations scholarship has explored the variables that shape support for defense spending, an adjacent one to the question of emerging technology. For example, how wars are financed may influence their levels

of support (Flores-Macías and Kreps 2017), lower income individuals may be more likely to support higher defense spending (Caverley 2014), and the concentration of distribution of gains from globalization into the hands of the top 1 percent drives protectionism (Flaherty and Rogowski 2021). But research has so far neglected the question of what individuals are willing to do to protect strategic resources, including how much they are willing to pay personally for nationally strategic advantages.

2.3.3 Experience

Finally, emerging technology can transform how individuals *experience* (in)security, influencing both individual exposure to insecurity and how others perceive their experience from afar. The former is important because individual-level attitude changes can drive subsequent shifts in responses to violence. Extant literature has explored how exposure to violence affects attitudes toward the use of force across a range of contexts, including by terrorists[10] (e.g. Berrebi and Klor 2006, 2008; Falcó-Gimeno, Muñoz, and Pannico 2023; Getmansky and Zeitzoff 2014; Montalvo 2011), guerilla groups (Gallego 2018); insurgent groups (Weintraub, Vargas, and Flores 2015); right-wing extremists (Krause and Matsunga 2023; Pickard, Efthyvoulou, and Bove 2023), and the violence-attitude relationship inter-generationally (Rozenas, Schutte, and Zhukov 2017). These theories build important microfoundations[11] for understanding political attitudes after individuals experience violence, and they contribute to our understanding of broader public opinion-international security phenomena like rally-around-the-flag effects (e.g. Baum 2002; Lee 1977; Mueller 1973; Oneal and Bryan 1995; Seo and Horiuchi 2024) and diversionary wars.[12]

However, all these studies rely on assumptions about the essence of violence and how individuals experience it — assumptions that emerging technology puts into question. For example, the definition of terrorism is hotly debated, even in the public domain (Huff and Kertzer 2018). Terrorism exposure is often conceptualized and measured[13] using death counts, reflecting in part the historical importance of the role of casualties in the public opinion literature (e.g. Gartner 2008; Gelpi, Feaver, and Reifler 2006, 2009). However, emerging technologies have the capability to transform how violence is experienced, either by dramatically increasing their lethality and scope, or by dramatically reducing casualties by increasing defensive capabilities. Each of these phenomena can be seen in the current Israel-Gaza conflict initiated by Hamas' October 7, 2023 attack. In Gaza, the diffusion of AI capabilities has reportedly rapidly accelerated target identification and increased the frequency of targeted strikes in

[10] Categorizations of actors here based on author description of texts; these terms may be overlapping in some contexts based on definitions.
[11] For a discussion of microfoundations in international politics, see Kertzer (2017).
[12] For an overview of the foundations of the diversionary war literature, see Levy (1989).
[13] For a discussion on concepts and measurements in terrorism, see Young (2019).

private spaces (Abraham 2024). In contrast, in Israel, anti-missile defense technologies intercepted 99 percent of the more than 300 long-range missiles sent from Iran in April 2024 (Lendon 2024). Although property damage was limited on the targeted Nevatim air force base and no casualties were endured (Spender 2024), many Israelis still called for retaliation against Iran (Landale 2024). Emerging technology can thus fundamentally change how security, or lack thereof, is experienced in conflict. Thus, while IR scholarship has undertaken substantial work connecting violence to attitudes, it has heretofore neglected the question of how attitudes change with emerging technology.

These technology-induced transformations in the lived experience of violence matter not just for those experiencing violence, but from those observing violence from afar. The ongoing 2023/2024 Israel-Gaza conflict provides an illustrative case-in-point: emerging technology matters not simply because it has changed how Israelis and Gazans experience conflict, but because it has transformed how the outside world thinks about broader questions around whether certain emerging technology use cases are justified, both strategically and ethically. This particular question converges with extant literature on attitudes toward the deployment of emerging technology in conflict settings (Horowitz 2020: 387; Kertzer 2023: 467).

For example, the literature on public opinion and drones suggests external publics' concern about civilian experience of violence shapes their attitudes, reflected in concerns over casualties (Walsh and Schulzke 2018). Other factors, such as accordance with international humanitarian law agreement (Kreps 2014) and international support mechanisms (Lushenko, Raman, and Kreps 2022) may affect drone deployment attitudes. Experience-based concerns also reflect in attitudes toward the export of drone technology, wherein support for exporting drones varies based on potential use-case (Lushenko 2024).

Casualty considerations are also part of a bundle of factors — including lower attributional certainty, unclear territorial bounds, and ambiguous applications of international law — that shape attitudes toward public opinion on cyber weapons, further underscoring how perceptions of others' experience of conflict shapes attitudes. Extant literature shows that understanding the potential lethality of a cyberattack reduces public support (Shandler et al. 2021), while a cross-national study shows that only lethal cyber terrorism triggers strong support for retaliation (Shandler et al. 2022). Further studies have addressed the question of support for retaliation amidst high casualties, showing that publics are in fact willing to escalate and retaliate against cyberattacks when casualties endured are high (Leal and Musgrave 2023). Public support for retaliation against cyberattacks is especially strong when there is higher attributional certainty (Hedgecock and Sukin 2023; Jardine, Porter, and Shandler 2024) and the attack

occurred relatively recently (Hedgecock and Sukin 2023). Extant literature also points to geographical experience as a critical variable shaping public trust; public trust following cyberattacks is, on average, greatest in the areas closest to the attacks (Gomez and Shandler 2024).

Despite the clear role civilian experience plays in shaping attitudes toward the use of drones and cyber technologies, its role appears more limited in other contexts, such as nuclear weapons. Substantial literature has tried to understand the origins and limits of the nuclear taboo (Tannewald 1999), but extant public opinion literature on the nuclear taboo suggests concerns around civilian experience of violence have played a less critical role in shaping nuclear non-use norms, which may instead be driven by military utility calculations (Press, Sagan, and Valentino 2013). Other research shows that Americans have limited concern for just war doctrine (Sagan and Valentino 2017), and that this applies beyond the U.S. context (Dill, Sagan, and Valentino 2022). Moreover, nuclear weapon deployment attitudes are shaped by assumptions about the user of the technology (Smetana, Vranka, and Rosendorf 2023) and may have different ethical underpinnings than other-regarding considerations (Rathbun and Stein 2020). Amidst invasion by Russia, Ukraine's publics concerns about both fatalities and the possibility of nuclear war pale in comparison to concerns around losing territories, such as in Ukraine (Dill, Howlett, and Müller-Crepon 2023). This relative lack of emphasis on experience-based concerns within the public opinion on nuclear weapons literature, especially when compared to drones and cyber-attacks, suggests the need for further research that explores how technological change shapes public attitudes toward security but also the need to deepen our understanding of the factors that shape attitudes toward technological use-cases.

2.4 Studying Public Opinion on AI in National Security

Studying public opinion at the emerging technology-national security intersection is important in its own right; however, research on all these technologies will be especially important as frontier artificial intelligence develops.[14] Although AI's technical complexity creates challenges for governance (O'Shaughnessy et al. 2023), AI has cross-sectoral applications that will shape the nature and power of existing emerging technology, the structure of security risks, and how publics — including non-experts (Sartori and Bocca 2023) — relate to both technology and risk. Understanding public opinion is also normatively important because citizens are key stakeholders that can shape the future of AI and should inform policy decisions (Zhang 2023). AI, including at the public opinion level, is characterized by a "trust paradox" whereby publics do not want to lose out on its benefits despite its potential risk (Kreps

[14] AI has been subject to substantial definitional debates. See, for example, O'Shaughnessy (2022).

et al. 2023). Understanding how public opinion will shape the broader AI landscape, including for elected officials, non-elected national security policymakers, companies, and civil society, will be critical to understand how AI mediates the public opinion-national security relationship.

2.4.1 What We Know About Public Opinion on AI National Security Issues

Research on public opinion on AI is currently embryonic and has not yet been substantially engaged with by academic political scientists despite its rapidly growing policy centrality and transformative potential.[15] These studies highlight promising foundations for directions for academic political science and IR research, but they do not themselves carve out a clear direction for academic research connecting public opinion, national security, and AI. AI also has the potential to alter political behavior (Gallego and Kurer 2022) as well as shape the relationship between publics and policymakers, with critical implications for democratic representation, including in the field of national security. Moreover, Kreps and Kriner (2023) conducted a field experiment in which they measured the difference in response rates to letters written by humans compared to AI, with little substantive difference in response rate. There is also a question of trust in the creators of AI and other emerging technologies: despite general concerns about AI and automation, both science and scientists tend to be well-regarded (Funk et al. 2020), while about half of global respondents trust companies that use artificial intelligence as much as they trust other countries (Maslej et al. 2024: 439). Finally, attitudes toward AI development and deployment may have substantial cross-national variation. For example, a 2020 study found Singaporeans generally held positives views toward AI development, while the French public thought AI development was more bad than good (Johnson and Tyson 2020). Stanford's 2024 Human-Centered Artificial Intelligence Report found that people in Indonesia were most likely to agree that "products and services using AI have more benefits than drawbacks," followed by Thailand and Mexico, while France, the U.S., and Canada were most likely to disagree (Maslej et al. 2024: 441). Stronger connections to national security exist in the think tank space; for example, think tank research published in 2019 shows that the U.S. public underestimated both U.S. and PRC AI research and development (Zhang and Dafoe 2019). The report also showed that the U.S. public supported cooperation with the PRC on some key AI issues (Zhang and Dafoe 2019). Thinking about cross-national variation, implications for democratic accountability, trust in scientists, and industrial policy all provide useful foundations for public opinion research on AI in the national security domain. But creative strategies, such as studying lessons from existing technologies,

[15] Because the AI field is so rapidly transforming, this article represents a best-faith effort to capture the state of the field at the time of writing, though changes could occur even between submission times and ultimate publication.

may still provide the clearest pathways to making predictions about the future of AI in these domains (e.g. Ding 2024a, 2024b; Leung 2019).

As a potentially transformative general-purpose technology, AI could be especially important over the course of decades based on its diffusion into the economy (Ding 2024a, 2024b); however, extant research strongly prioritizes short-term risks. The public has already expressed concern for the use of algorithms in criminal risk assessments for parole, automated resume screening, automated video analysis for job interviews, and personal finance scores (Smith 2018), but generally believes AI will help in areas like making safer cars and trucks and helping doctors improve care to their patients (Maslej et al. 2024: 452). Many of these use-cases also have clear connections to international security. For example, the future of autonomous weapons — discussed in the previous sub-section — is dependent on advances in AI, including the longer-term possibilities of artificial general intelligence or superintelligence (Kleczkowska 2023: 26). In the context of surveillance technologies, explored in this dissertation's friendshoring paper, a majority in a sample of the British public wanted restrictions on the use of facial recognition technology (Ada Lovelace Institute 2019). However, facial recognition technologies pose a challenging trade-off between safety and privacy, with 49 percent of respondents stating they believed facial recognition technology in public spaces constituted an invasion of privacy, but 61 percent believed there could be public safety benefits for adoption (Andrejevic et al. 2020). Other surveys on facial recognition technologies point to the public perceiving relatively high benefits in terms of convenience and improved security (Kostka, Steinacker, and Meckel 2021). Despite the clear national security risks tied to certain use-cases, extant political science research has not yet made the jump from domestic use-case risks to national security and foreign policy concerns.

There are also lessons to be learned from literature studying automation before AI. This will certainly be true of lethal autonomous weapons (LAWs) — also known as killer robots (Horowitz 2016). Here, public opinion highlights factors shaping attitudes toward technological development and use-cases worth tracking as LAWs become enhanced through AI. For example, public support for autonomous weapons development increases when fears of competition from other countries and non-state actors are raised (Horowitz 2016). Support for their use may depend on the level of weapon autonomy (Rosendorf, Smetana, and Vranka 2022) and exposure to popular cultural references connected to the technology (Young and Carpenter 2018). Contextualized within other automating technologies, experts are less likely to support automating weapons compared to other automation use-cases (Horowitz et al. 2023). On the question of attribution of responsibility, initial research suggests leaders and designers of autonomous weapons systems will not be able to avoid responsibility for building systems (Walsh 2015).

These questions on use-cases and responsibility will become increasingly complicated as AI systems become increasingly autonomous.

Automation has not only posed important questions for international security in the context of political violence use-cases, but it has also introduced an important political economy literature linking automation to political preferences, with important implications for national security policy creation globally. For example, exposure to automation increases support for populists (Gingrich 2019), especially right-wing populists (Milner 2021). Whether a respondent considers personal risk or collective risk from automation can shape whether they support left- or right-wing populist parties, respectively (Borwein et al. 2024). AI may thus emerging technology national security policy directly, but also indirectly as job displacement influences candidate selection.

Taken together, extant literature provides a useful theoretical and empirical foundation upon which future research should build. Using this foundation, the next sub-section proposes both principles for expanding this triangle into a more concrete research agenda and explores particularly fruitful avenues for further research.

2.4.2 Developing a Research Agenda at the Public Opinion-AI-National Security Intersection

Systematic academic research exploring the role of emerging technology within the public opinion-foreign policy nexus has long been neglected despite its importance. While this triangle has long been important within international relations, now may be a uniquely pressing time for engaging in systemic study given the potential enormous impact AI may have on international relations. As a general-purpose technology with applications across international relations — a driver of great power competition, source of new national security risks, enabler of new military technologies, transformer of information transmission, modifier of the distribution of global power — international relations as a field must urgently prepare itself to think about the various ways AI may concurrently become more public-facing and securitized. This section proposes important principles for further research to study public opinion, national security, and emerging technologies, with particular emphasis on how this literature can prepare for AI.

As this literature develops, it should do so following three key principles: 1) take a global, multiplex perspective on knowledge formulation, 2) embrace policy as a key input and driver for research, and 3) leverage the opportunity to study previous technologies to potentially draw lessons for future technologies. This agenda celebrates the diversity of perspectives publics may have around emerging

technologies globally and the opportunity to learn from different contexts, prioritizes real-world impact through engagement with policy communities, and establishes a two-pronged approach to studying previous emerging technologies along with frontier AI to conduct future research.

First, international relations must take a **global, multiplex approach** toward knowledge formation on public opinion, national security, and emerging technology, recognizing the empirical importance of many different countries for AI development and regulation. Much like international relations itself, AI development and deployment is a multiplex theatre (Acharya 2014), where changes in AI are occurring simultaneously across multiple geopolitical contexts and facing publics with different experiences, identities, and values. IR should embrace the opportunity to develop new theories, including at the mid-range level that acknowledges the unique empirical opportunities to study different cases, learn lessons that apply to multiple contexts, and clarify implicit assumptions built into previous theories. This global approach has normative foundations too: as states, firms, and institutions begin to set norms in AI governance, understanding the full range of ideas, trade-offs, and values faced by global publics will be critical to ensure AI is developed in ways that do not simply reify the values of a select geographically concentrated few.

Second, academic research on emerging technologies, including at its intersection with national security and public opinion, should **embrace its historically close connection to policy communities**. As was true at the end of the Cold War, security studies must evolve and adapt to the changing security environment to create policy-relevant theory (Crawford 1991: 309), and this is especially true of emerging technologies. As Kello (2013: 14) writes, "The theory-policy nexus is especially close in a period of rapid technological change, in which threats and opportunities arising from a new class of weapon produce pressures to act before the laborious process of strategic adaptation is concluded." Scholars focused on the tech-security-public opinion nexus should be aware of policy concerns and seek to engage in meaningful bridgebuilding — researchers should use policy input as one consideration for developing their own research as well as highlighting potential policy blind spots that academic research could help correct. This principle has two clear present implications. First, given that policymakers in many global contexts are primarily taking an expansive view of security, research agendas should address a wide range of potential security settings. This more expansive understanding of security involves both military and non-military settings, as well as studying the effects of technology on previously understood national security risks as well as the study of new risks. Second, and more specifically, academic IR must reckon with the future of AI, where policy attention has uniquely ballooned, with the founding of think tanks like the Center for Security and Emerging Technology and intra-government programs like the UK

AI Safety Institute within the Department for Science, Innovation, and Technology, that are proactively shaping research agendas at the forefront of AI policy and governance. The volume of academic research in IR on public opinion and AI should at least partially address these stakeholder's concerns, as well as those of stakeholders outside of the United States and other Western countries. Practically, researchers should ground their research in deep understanding of policy communities globally and work to translate their results into key takeaways policymakers can grasp.

Finally, IR should take a hybrid approach that blends the study of previous emerging technologies along with attempts to study the frontier of AI. This dual approach will enable researchers and practitioners to leverage knowledge and lessons learned from previous technologies to AI — including foundational components like compute, algorithms, data, and other automation applications — as well as begin to develop creative ways to study AI as it becomes more public facing. Given that AI is still in its early stages of entering the public domain, international relations should begin by prioritizing lessons from previous technologies, including those that may continue to transform with AI development, before moving increasingly toward study of frontier AI itself.

Given these principles, there are many fruitful ways that IR can begin to tackle the emerging tech-national security-public opinion nexus in the age of AI, building on the pillars of consumption, production, and experience. Within the consumption pillar, future research should explore public understanding of emerging technology-related trade-offs and elite-public gaps. Within the production pillar, research should focus on the microfoundations for technology arms racing and domestic sources of global competitiveness in emerging technology, as well as threats to those production advantages. Finally, within the experience pillar, research should focus on the changing character of conflict and the normative questions raised by new AI use cases.

Consumption: Focusing on Trade-Offs and Elite-Public Gaps

First, research should study how *publics understand emerging technology-related trade-offs, and differences in understanding between technical experts and the general publics***.** Many of the most important technologies today, including and beyond AI, require difficult trade-offs between security and other concerns, such as economic opportunity, privacy, and other ethical considerations. Other technologies that raise these trade-offs include facial recognition, collection of substantial amounts of individual-level data (especially biological data), and other forms of surveillance that may or may not be empowered by large language models. In some cases, these trade-offs do not require substantial technical understanding, such as

economic-privacy trade-offs. Understanding public attitudes toward these trade-offs, including variation across different demographics, can ensure frontier AI is built in accordance with appropriate values.[16] These values, including levels of risk tolerances for frontier models, could be important in AI evaluations, which lack the clear red lines the risks nuclear or biological weapons possess.[17] These trade-offs should be studied in the context of both present risks, as well as potential future risks evaluated in the presence under uncertainty. Variation in public attitudes due to characteristics of dual-use technologies that are public-facing — including their technical nature, their geopolitical importance, role in supply chains, and current regulatory status — could deepen understanding of how consumers shape markets for important emerging technology.

Production: Arms Racing, The Domestic Foundations of Emerging Tech Competitiveness, and the Tech Private Sector

Arms Racing

In addition to the study of trade-offs, researchers should seek to better understand *how domestic incentives may drive arms racing and technological deployment*. Structural theories like the security dilemma (Jervis 1978; Glaser 1997), which have been used to explain arms racing and point to technology as a key input, may have domestic logics (Buzan and Herring 1998: 101-18; Glaser 2000: 256-9) and even public opinion-specific microfoundations (Kertzer, Brutger, and Quek 2024). Scholars should seek to better understand whether states face domestic pressure from public actors to engage in arms racing for particular technologies, as was the case with Sputnik, or whether public opinion constrains further development. Once states have accumulated technologies, scholars should study whether publics pressure leaders to deploy them, whether they understand the risks of doing so, and whether leaders have ways of circumventing public pressure (e.g. Quek and Johnston 2017/18). These motives may connect technological deployment to theories of public opinion, such as rally-around-the-flag effects or diversionary wars, explaining why some technologies are deployed in conflict but not others. Scholars should also consider potential economic motivations for pursuing leading edge new technologies, such as the desire to have self-sufficiency over key resources. Regardless of whether states follow military or economic logic to arms racing, scholars should study the conditions under which publics accelerate or challenge these arms racing processes.

[16] For a discussion of the alignment problem, see Christian (2020).
[17] I am grateful to Jade Leung for this suggestion.

The Domestic Foundations of Global Competitiveness in Emerging Technology and Their Threats: Polarization, Industrial Policy, and Immigration

Further research should study domestic sources of global competitiveness in emerging technology: both industrial policy and immigration. State-driven efforts to develop cutting-edge emerging technologies require substantial investment and sacrifice by taxpayers. On the other hand, arms manufacturers and shipbuilders — and constituencies in which these industries drive the economy — may benefit from conflicts. Research exploring the drivers and constraints on state-level initiatives, as well as research digging into local politics with international policy implications, will provide a better understanding of the potential success of industrial policies in frontier AI and other emerging technologies.

In addition to studying the domestic sources of industrial policy, a similar approach should be taken to both individual immigration decisions and attitudes toward immigration policy writ large. STEM talent is an intersectional input that will increase all inputs in AI and other critical emerging technologies, therefore influencing the distribution of power within the system (Zwetsloot 2021). Given the importance of immigration for AI and other emerging technologies, future research should study whether, and under what conditions, skilled workers want to relocate and to which countries. Moreover, research should study whether public opinion supports immigration to compete on the global scale, as well as geographic variation both within and across states.

More broadly, industrial policy and immigration are also key areas of emerging technology development and governance that are intersectional to highly politicized areas of politics, especially in countries like the U.S. Further research should study when and how AI is being politicized and connected to existing polarized areas of politics and how these interconnections shape individual beliefs about present and future opportunities and risks connected to AI.

Domestic Constraints on Industry-Government Dynamics and the Evidence Environment on AI Capabilities

The tech private sector — and particularly a small number of companies within the frontier AI supply chain — will play a disproportionate role in shaping the technology's technical and geopolitical trajectory. Companies' level of regulatory influence is intimately connected to their market power (Vipra and Korinek 2023). Yet as AI becomes increasingly public facing, the regulatory environment around AI companies may become increasingly shaped by public attitudes. For many companies, their centrality for national security currently dictates a favorable regulatory environment and they engage in agenda-setting

that socializes this role with the public (Wei et al 2025). Whether those conditions remain will be shaped by public attitudes on emerging technology policy. On the other hand, these companies will also play a growing role in shaping public information that shapes attitudes and beliefs. How companies shape the public-facing evidence environment (Bommasani et al. 2025; Bommasani, Singer, et al. 2025) for voters could fundamentally alter the emerging technology contexts in which voters understand national security risks, as well as the AI policies of candidates they may be electing.

Experience: Changing Character of Conflict and Associated Normative Questions

Emerging technologies may not only structure future conflicts, they may also shape current conflicts across a wide-range of political violence settings, many of which were documented in the previous sections.[18] These technologies may have specific use-cases in conflicts on both offense, like drones, and defense, like anti-missile defense systems, that shape or alter previous international security theories which have domestic foundations, such as effective counterterrorism (Bueno de Mesquita 2007). Scholars studying the changing character of conflict should therefore explore how technology influences those exposed to violence, how external actors shape perceptions of those exposed to violence, public attitudes toward and acceptance of logics to using different technologies during conflict. These attitudes may also vary across time, space, technologies, and contexts. Given the literature's extant substantial emphasis on the role of casualties as a mechanism shaping public opinion (Gartner and Segura 1998; Gartner 2008; Gelpi, Feaver, and Reifler 2009), research should explore how emerging technologies and AI may alter or reify existing casualty-related findings. Indeed, since FDR's time, senior foreign policymakers have advocated for using technology strategically to minimize casualties (Casey 2014). For example, Casey (2014: 235) describes how "Nixon's low-casualty obsession had morphed into Rumsfeld's attempt to focus on technology and speed, rather than mass armies." Beginning from particularly important use-cases may reveal further critical lines of inquiry in terms of public attitudes toward the changing nature of conflict.

In addition to studying how technology changes how individuals respond to conflict, future research should build on extant literature exploring normative microfoundations for various emerging technology use-cases. This literature should build on the attitudes toward nuclear use literature described in the previous sub-section and understand when publics think AI use in conflict is justified, as well as variation across countries and situation characteristics.

[18] For an overview of the various types of conflict settings, see Kalyvas (2019).

2.5 Conclusion

Emerging technology national security policy is not simply cooked up by unconstrained elites; history reveals that publics have long played a critical role in shaping the trajectory of emerging technology development and regulation. Moreover, 21st century emerging technology issues are likely to generate even greater public attention compared to previous eras due to the technology's direct consumption, production, and experience by large sectors of the public. While extant literature has provided fruitful foundations for further research within the consumption, production, and experience pillars, further research is needed to develop a more robust and coherent research agenda. This will be especially critical as AI systems become increasingly sophisticated, consequential, and diffused into public life. While research on the public opinion-national security-AI triangle is emerging, more systemic research is needed. The consumption, production, and experience pillars of previous emerging technologies provides a useful roadmap to deepening this research agenda.

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Chapter 3

Why the Public Supports Friendshoring Dual-Use Technology: Evidence from the United Kingdom

Abstract

Dependence on dual-use technologies like 5G, semiconductors, and undersea cables has inspired fierce debate within economically developed democracies, with debates on which countries to rely on for critical technologies increasingly playing out in public discourse. Yet dual-use tech is theoretically distinct from other critical technologies and everyday goods: they combine the strategic centrality of critical technologies like F-35s with the robust markets of everyday goods. Dual-use technologies thus present a novel security-pocketbook trade-off in procurement decisions. How, then, do price and security considerations influence public attitudes toward trade in dual-use technology? I argue that from the public's perspective, security conditions the relative importance that price plays. Specifically, whereas publics are price insensitive in situations where trade produces negative security externalities, publics become increasingly responsive to relative price changes when the country of the alternative technology provider is within their alliance network, substituting toward cheaper, foreign alternatives as price decreases, a phenomenon I term *alliance-based price elasticity*. To illustrate this effect, I conducted a novel survey experiment asking British respondents whether they preferred their government purchase either British or foreign CCTV cameras, varying the price and country of origin of foreign technology bids. Whereas offering a 50 percent discount on Chinese dual-use technology resulted in a 7 percent decrease in the probability the respondent preferred buying British technology, offering American technology as the foreign technology alternative resulted in a 21 percent decrease in the probability the respondent preferred buying British. This research offers a new framework for theorizing on the unique attributes of dual-use technology in trade, contributes microfoundations for theories on alliance-trade dynamics, and provides insights to policymakers on the drivers of public preferences toward procuring dual-use technologies.

Why the Public Support Friendshoring Dual-Use Technology: Evidence from the United Kingdom[1]

"There has been a lot in the news in recent days about how concerned we should be about Chinese spy balloons 60,000 feet up in the sky. I do not understand why we are not at least as concerned about the Chinese cameras 6 feet above our head in the street and elsewhere."

– PROFESSOR FRASER SAMPSON, UK BIOMETRICS & SURVEILLANCE CAMERA COMMISSIONER, FEBRUARY 2023

3.1 Introduction

As news of an alleged spy balloon flying over Montana caught the attention of the United States' public in February 2023, different tech geopolitical news was making its rounds on front pages across the Pond. Newspapers like the *Times* (Spirit 2023), *Guardian* (Stacey 2023), and *Telegraph* (Hymas 2023) reported that foreign firms could face severe restrictions by the UK government in the procurement process of critical technologies, with the story pegged specifically to concerns about Chinese CCTV firms Hikvision and Dahua. The UK's turn toward regulating procurement of foreign technology was not simply a pre-emptive regulatory move. Rather, it was a reaction to the fact that critical technology was already deeply embedded in Britain's security architecture, following extensive debates in the country around regulating technologies like Huawei and TikTok. As *Beijing to Britain* reported (Hogg 2023a), a survey of all 43 police force areas in England and Wales conducted by the Office of the Biometrics and Surveillance Camera Commissioner, Professor Fraser Sampson, revealed that over half relied on "cameras or equipment manufactured or supplied by surveillance companies outside of the UK about which there have been any security or ethical concerns," almost all of which came from the United States or People's Republic of China (PRC) (OBSCC 2023). Sampson wrote further, "There has been a lot in the news in recent days about how concerned we should be about Chinese spy balloons 60,000 feet up in the sky. I

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do not understand why we are not at least as concerned about the Chinese cameras 6 feet above our head in the street and elsewhere." The news also made its way to the public, with protestors from Free Tibet and Big Brother Watch yielding balloon-shaped anti-Hikvision signs in Parliament Square (Hogg 2023b).

Cameras used for police surveillance were the latest in a series of cases in which dependence on foreign commercial entities for strategically critical dual-use technology — defined in this paper as those with an intended or primary civilian use but with potential harmful additional political, security, military, and intelligence applications (Forge 2010, Mahfoud et al. 2018)[2] — entered into the public eye in developed economies in North America and Europe. Questions around incorporating Huawei 5G were the most widely reported, but policymakers have also navigated difficult questions on where to buy undersea cables, navigation systems, and encryption technologies. As dependence on strategically critical technologies has becomes increasingly publicly salient, public attitudes — which can influence and constrain policymakers (Tomz, Weeks, and Yarhi-Milo 2020) — will theoretically become an increasingly important input into international trade and investment regulatory decisions. As such, this paper asks: how do price and security considerations influence public attitudes toward trade in dual-use technology?

The relationship between security and trade preferences has long been an important area of international relations inquiry, particularly in the context of alliance politics (Gowa 1995; Gowa and Mansfield 1993). The alliance-trade intersection has been the subject of a new wave of research that explores the critical role public attitudes often play in explaining preferences around trade and international security questions (Carnegie and Gaikwad 2022; Steinberg and Tan 2023). This is particularly important because the security-trade nexus has been central for voters in elections across a range of geographic and temporal contexts.[3] Most scholarship in this area explores attitudes toward the trade of goods in general — such as by measuring attitudes toward free trade agreements — and does not discriminate based on the specific type of goods being traded. This is a critical omission. Because of the novel ways that dual-use technologies impact a state's security, this specific class of goods creates theoretically unique trade-offs for the public to consider. Public decisions also carry particularly important weight in the context of U.S.-China great power competition. These dual-use technologies, which can be used directly or become critical inputs to exfiltrate data, spy on rivals, and enhance world-leading military technology, are

[2] Definitions of dual-use are contested (Vaynman and Volpe 2023) and often focus more specifically on use in civilian and military domains (. My definition combines that provided by Forge (2010) and Mahfoud et al. (2018), though they individually vary.

[3] Examples outside of the United States include the centrality of the U.S.-Canadian Free Trade Agreement in the 1988 Canadian election (Mauser and Fitzsimmons 1991), to Russian sanctions moving affected Ukrainian voters toward more pro-Western engagement stances (Seitz and Zazzaro 2020), to more contemporary debates around dependence China, such as in the 2019 Australian election (Johnson 2020: 43-5). For examples inside the United States, such as the United States' elections post-World War II and debates around the Trans-Pacific Partnership, see Carnegie and Gaikwad (2022: 167).

generally produced by commercial firms (Raska et al. 2021). They can be traded or procured, sometimes without regulation. Thus, the regulation of dual-use technology — and public attitudes in this area — has become a key battleground across a range of third countries stuck in the middle of great power competition and has become subject to increasing public scrutiny.

I argue dual-use technologies represent a unique area of trade and procurement in that they have clear security importance and military applications and are simultaneously consumed and influenced by public consumption patterns and attitudes. Compared to the purchase of other critically sensitive technologies, dual-use technologies are more likely to be competitively priced due to a more competitive supply-side market that introduces price as a key variable for critical technologies. As such, they are more likely to be influenced by both consumer behavior and voter preferences, creating a distinctive *security-pocketbook trade-off* for dual-use technologies. Consistent with recent empirical work on public opinion toward alliance-trade dynamics, I show that public preferences for trade in dual-use technologies follow a friendshoring logic: publics support trade within, but not across, alliances. However, moving beyond extant *structural* level explanations for friendshoring (e.g. Gowa 1995), this paper argues that public opinion follows a similar, *microeconomic* logic: whereas publics are price insensitive in situations where trade produces negative security externalities, publics become increasingly responsive to relative price changes when the country of the alternative technology provider is within their alliance network, substituting toward cheaper, foreign alternatives as price decreases. Thus, even for individuals, national security concerns condition the role that pocketbook considerations play in economic and technological interdependence, a phenomenon I call *alliance-based price elasticity*.

To test my argument, I focus on British attitudes toward incorporating foreign dual-use technology. I conducted a 1,793-person representative survey experiment of British respondents in August 2022, in which I exploited cross-sample variation in the price and country of origin of surveillance technology to study their effect on public preferences. Stuck in the middle between strong security ties to the U.S. and economic connections to China, the UK is in many theoretically critical ways a representative case upon which to study attitudes toward incorporating foreign technology. The vignette's topic — reliance on foreign video cameras in public spaces — a fringe issue in the public sphere at the time of the survey, has since received significant media coverage, rendering the survey a novel measurement of attitudes toward incorporating foreign technology pre-media exposure. In addition to this survey, I interfaced with PRC-focused Parliamentary staffers, journalists, and civil society leaders — including several on a regular basis — from March 2022 through February 2023 through in-person meetings, calls, and texts, to understand the most pressing areas in the UK-PRC policy world and to contextualize my results.

I show that both the country of origin and relative price of foreign dual-use technology are statistically significant predictors of the technology preferences of the survey's British respondents. More importantly, I show that alliance dynamics condition the relative importance of price in the respondent's decision, providing strong evidence of alliance-based price elasticity. Whereas offering a 50 percent discount on Chinese dual-use technology resulted in a 7 percent decrease in the probability the respondent preferred buying British technology, offering American technology as the foreign technology alternative resulted in a 21 percent decrease in the probability the respondent preferred buying British, results which held up across a range of specifications and robustness checks, suggesting that publics indeed follow friendshoring patterns in their preferences toward dual-use technology.

Given that publics are theoretically less likely to be aware of the presence of security risks procuring foreign technologies than policymakers and are generally more likely to defer to pocketbook logics, they represent a harder case to illustrate the presence of securitization logics of dual-use technologies. Nonetheless, the high degree of alliance-based price elasticity suggests that publics are broadly aware of the presence of risk in relying on foreign actors for procuring dual-use technology, prioritizing security concerns over price concerns when choosing between their own country's technology and that of an adversary. While some politicians may hesitate to pursue expensive supply chain restructuring due to public backlash over increased prices, I show publics are likely to provide foundational support for policies regulating critically sensitive technologies from adversaries.

Beyond alliance-based price elasticity, I show that a plurality of respondents preferred to buy British, suggesting that marginal flexibility around trading with allies may be less dominant than overarching protectionist attitudes held by the British public. Moreover, some respondents expressed a preference for not incorporating the technology at all, revealing that for many respondent perceptions of risk were closely connected to concerns around the use of technology for malicious use and particularly potential violations of privacy.

These attitudes may well shape how policymakers in democratic countries with deeply established alliance networks regulate foreign technologies like CCTV cameras. Elected leaders — from FDR (Berinsky 2009: 34) through Nixon (Druckman and Jacobs 2006) to the present — have relied on polling data on specific topics to inform their policy stances. Moreover, as topics become increasingly salient to the public, politicians are more likely to be responsive to more granular positions held by the public (Druckman and Jacobs 2006). Elected policymakers in the UK reckoning with similar economic-security concerns have already explicitly reflected their constituents' concerns — as the UK government attempt to force a reversal of the sale of the Newport Wafer Fab to the Chinese firm Nexperia because of

national security concerns, Newport's MP Ruth Jones opposed it on the basis that it would threaten 600 people living in her constituency (Deans 2022).

This paper makes theoretical, empirical, and policy contributions. First, I reframe the debate around dual-use technology by providing a novel typology that shows the conceptual overlap between everyday goods and traditional critically sensitive technologies. In so doing, I illustrate how trading and procuring dual-use technologies reflects a novel combination of sensitive application with the presence of market dynamics in the process — conceptualized as the security-pocketbook trade-off — highlighting how public opinion is uniquely theoretically important in the case of dual-use technologies. Second, I provide microfoundations for a key finding in the alliance-trade literature typically evaluated on the macro-level: that allies are more likely to trade with allies than adversaries, showing how price and security considerations both influence individual attitudes. Specifically, I show respondents were more sensitive toward changes in price when publics were faced with a bundle of their own country and an ally as opposed to their own country and an adversary, explained through the novel concept of alliance-based elasticity. Finally, the frameworks provided in this paper, as well as the results of this survey, will be useful to policymakers who are seeking to understand their public's attitudes toward critical questions on sensitive technologies amidst U.S.-China great power competition, applicable to questions including but extending far beyond procurement, 5G, and spy balloons. While most of the literature from public opinion suggests foreign policy or security concerns are rarely more important than pocketbook logics, I show that publics implicitly securitize their preferences for government procurement. As governments like the UK grapple with whether and how to regulate procurement and foreign ownership over critical technologies in scenarios similar to the one I model — such as through the UK's Procurement Act or the U.S.' Protecting Americans from Foreign Adversary Controlled Applications Act — my survey provides a key barometer of what and how the public thinks.

The rest of the paper proceeds as follows. After situating this paper within the relevant literature, I provide a series of hypotheses about how public attitudes might be conditioned by both security and pocketbook considerations. I then describe the research design, share results, and conclude.

3.2 Alliances and Trade Preferences in Emerging Technology: An Underexplored Research Area

The relationship between alliance dynamics and trade has long been a central area of inquiry of IR scholarship (e.g. Gowa 1989a, 1995; Gowa and Mansfield 1993, 2004; Mansfield and Bronson 1997; Mansfield and Pollins 2003) and the political economy of security more broadly (Poast 2019). While distinctive lines of research explore the effect of international politics on trade dynamics (e.g. Berger et

al. 2013; Davis and Pratt 2021; Fuchs and Klann 2013) and the relationship between public opinion and trade preferences (Brutger and Rathbun 2021; Guisinger 2017; Lü, Scheve, and Slaughter 2012; Hainmueller and Hiscox 2006; Mansfield and Mutz 2009; Mayda and Rodrik 2005; Rho and Tomz 2017; Scheve and Slaughter 2001), a growing strand of research touches on the explicit alliance-trade-public opinion intersection.

Two distinctive theories produce different predictions about how international security relationships could influence patterns of trade, as Carnegie and Gaikwad (2022) point out. The security externalities literature would predict that because surpluses from trade with adversaries will allow adversaries to enhance their military power (Gowa 1989b), suggesting that publics would be less likely to support trade with adversaries than allies (Gowa 1995). Trade with allies, meanwhile, generates economic surpluses that could be used to enhance military production, thereby creating positive externalities. Liberal trade theory, however, provides an alternative prediction. If trade is a vehicle for peace, then individuals hoping to promote global peace might hope to see increased trade with adversaries (Oneal et al. 1996; Oneal and Russett 1997), a phenomenon observed in US public opinion surveying following the U.S.-China trade war (Bulman 2022). From a theoretical perspective, how alliance dynamics might affect international trade of dual-use technology is thus multi-faceted, though the extant empirical record provides evidence that security externalities logic tends to dominate previous trade patterns (Gowa 2015). Public opinion, meanwhile, has long been theorized as a key input to influence foreign policy outcomes (e.g. Baum and Potter 2015), such as through selection and responsiveness (Tomz, Weeks, and Yarhi-Milo 2020).

However, thinking about security-pocketbook trade-offs in the context of sensitive technology requires thinking about not only structural trade preferences but also budgetary constraints governments face when making procurement decisions. IR scholars have long theorized about "guns and butter" trade-offs (Powell 1993), but they have failed to consider how these trade-offs might change for the case of dual-use technologies, especially those which are low in distinguishability between civilian and military uses and high in integration between military and civilian economic development (Vaynman and Volpe 2023). While a small portion of IR literature has explored the political economy of these dual-use technologies, such as in the context of weapons of mass destruction (Fuhrmann 2008), dual-use technology has grown in importance especially with the proliferation of technology that applies artificial intelligence (AI), demanding that scholars explore security-economic trade-offs outside of the traditional defense sphere. In the second case, third countries choosing to adopt these technologies can accentuate the influence of the technology-providing states, creating forms of asymmetric dependence or access to greater data that

distinguish it from non-networked dependence (Farrell and Newman 2019) or induce security dilemma dynamics (Lupovici 2021).

Whether states adopt or reject foreign dual-use technology into their critical infrastructures has important implications in the age where technologies can be weaponized. As Farrell and Newman (2019) argue, control of networks provides states with access to information (panopticon effects) and the ability to deny access to users (chokepoint effects). Given that states can expand their networks — increasing their access to information and their potential ability to "choke" those that depend on their networks — understanding the microfoundations toward public attitudes around these networks is critical. This is especially true in the case of telecommunications, where internet platforms (Tusikov 2021) and 5G (Segal 2021) dual-use networks are among a growing range of networks that could be weaponized. Critically, while weaponized interdependence focuses on the actions that network-controlling states take to exert influence, these infrastructures can be "stumbling blocks and sites where hegemonic power is shaped, blocked, and routed in specific ways" (de Goede and Westermeier 2022). Thus, economic interdependence has not only been a tool to facilitate cooperation and provide absolute gains, but can be used a vehicle of coercion, or as Mulder (2022) describes, "economic war."

Questions around whether to build domestic industry, trade with allies, or pursue deals with adversaries are critical to understand especially given the foregrounding of intensifying U.S.-China great power competition in the tech sphere. Many Western countries, and particularly the United States, have created policy instruments that seek to target to reduce economic dependence on the PRC in particular (Pearson, Rithmere, and Tsai 2022). For example, Italy's FDI screening mechanism — called "Golden Power" — has now been used thrice to prevent China from acquiring Italian technology firms (Arcesati and Ghiretti 2022), while the UK's National Security and Investment Act identifies 17 strategically sensitive areas of the British economy in which it can prevent ownership transfers (National Security and Investment Act 2022). Other third countries have taken more expansive approaches to regulating the incorporation of foreign technology, with Japan and the Netherlands following the United States' lead in imposing widespread export controls aimed to stagnate the PRC's domestic semiconductor industry (Alper and Shepardson 2023). Together, many of these policy instruments form the policy foundation of policies that aim to "decouple" Western states from the PRC. Whether countries actually do restrict foreign technology is closely tied to how they evaluate security-pocketbook tradeoffs — and how public opinion sways attitudes toward those tradeoffs, reflecting key battlegrounds of US-PRC great power competition in areas ranging from information and communications technology (Calzati 2021), maritime ports (Kardon and Leutert 2022), to cybersecurity broadly understood (Lindsay 2014). Here the public may also play a key role, such as through contributing to US-PRC security dilemma dynamics (Kertzer,

Brutger, and Quek 2024) or pushing for further protectionism amidst great power conflict (Steinberg and Tan 2023), making understanding their thoughts around the trade of dual-use technology critical.

3.3 Friendshoring Dual-Use Technology: Theorizing How and Why Public Opinion Matters

From a public opinion perspective, I argue dual-use technologies represent a novel — and arguably most important — case for exploring friendshoring logics and micro-dynamics: they combine the security importance of critically sensitive technologies with potential greater exposure to both market and public opinion dynamics.

Dual-use technologies possess important heterogeneity in various ways that shape their political economy. These differences have important implications for national security. Just as supply-side dynamics for various dual-use technologies vary, so too do levels of consumer exposure to the technology. For example, whereas encryption technologies are most often purchased by governments, open-weight AI models are clearly much more consumer interfacing, with public preferences shaping market structures. Different dual-use technologies may vary meaningfully in their technical architecture features. For example, while 5G technology directly captures substantial amounts of user data on usage and location, critical minerals do not. Data exposure is not necessarily a binary: AI systems may capture user information in model weights. Some dual-use technologies, like navigation systems, are finished goods; others like semiconductors are intermediate goods; and some like AI systems may serve as both either. Different dual-use technologies may vary in their supply chain vulnerabilities — ASML's lithography machines create weaponizable dependencies that other technologies like surveillance camera do not. And dual-use technologies may vary in terms of how they are regulated. For example, technologies that subjected to export controls or CFIUS reviews may capture the security sensitive nature of dual-use technologies, while AI systems are generally subject to light-touch consumer-facing regulation. Nonetheless, I argue that dual-use technologies all share three core characteristics that unite them for the purposes of theory-building: strategic centrality, commercial production, and connection to public attitudes.

1. STRATEGIC CENTRALITY. From a technical perspective, dual-use technologies are strategically more critical than everyday goods, creating novel forms of risk when relying on foreign partners, such as new opportunities to engage in espionage, accumulate large amounts of data from other countries, or steal intellectual property. The novel risks associated with relying on foreign partners for critical technology was well-publicized, for example, in the case of the PRC using the IT network it built to spy

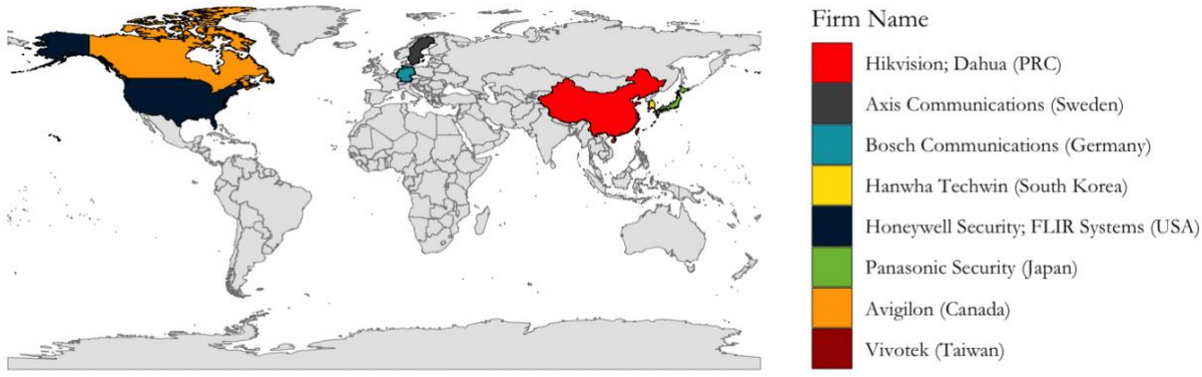
on the headquarters of the African Union (Fidler 2018). Undersea cables, used for civilian purposes such as transmitting data for telecommunications, are also have national security use-cases such as secure communication between military bases or monitoring underseas activity. Debates around 5G technologies — and associated national security risks from relying on foreign entities — motivated wide-ranging regulatory measures on Huawei's technologies in middle-power states ranging such as the UK, Germany, and Japan (Krolikowski and Hall 2023). Policy discussions, particularly in the U.S., have surrounded the integration of civilian and military technological development in the PRC through its Military-Civil Fusion, bringing heightened focus on dual-use technologies into the regulatory space (Kania and Laskai 2021). Thus, risks associated with trade and procurement of dual-use technologies do not simply reflect a desire to trade more (e.g. through free trade agreements) or less (e.g. through protectionist measures or trade war logics) with a particular partner, but heightened risks that are closely tied to security risk and military activity.[4]

2. COMMERCIAL PRODUCTION. Traditional strategically critical technologies are generally produced directly by the military or procured from one firm that specifically produces the technology: for example, the U.S. military procures F-35s from Lockheed Martin in what might be considered a monopolistic market. In such cases, the supplying firm does not face price competition in the provision of the technology itself; they are priced out only when the procuring government decides that purchasing the technology is not worth the price. Thus, the only price that matters in the market for the most critically sensitive technologies is a government's reservation price: the point at which they would not purchase the technology at all. Government choices are thus not subject to changes in supply-side competition. Moreover, these goods are rarely sold to or consumed by publics.

In contrast, the supply-side market for dual-use technologies may have many firms that compete, based in a number of countries, providing technology at a wide range of price points and are often consumed by governments and publics alike.[5] For example, as Figure 3.1 shows, CCTV video cameras could be sourced from globally competitive firms in the PRC, Sweden, Germany, South Korea, the U.S., Japan, Canada, and Taiwan,[6] with variation in price largely a function of the specific technical capabilities of the cameras.

[4] Levels of strategic centrality are also a function of a country's exogenous security context, influenced by the procuring country's level of security and their levels of domestic production of key technology. For most Western and Central European states, which are net-importers of critical technology and face similar levels of security threat, this level of strategic centrality is unlikely to vary significantly empirically but an important theoretical underpinning of the theory.
[5] Lists of supplying firms and their country of origin were initially generated using the assistance of Chat GPT-3 and subsequently edited and verified by the author.
[6] Incomplete list for illustrative purposes.

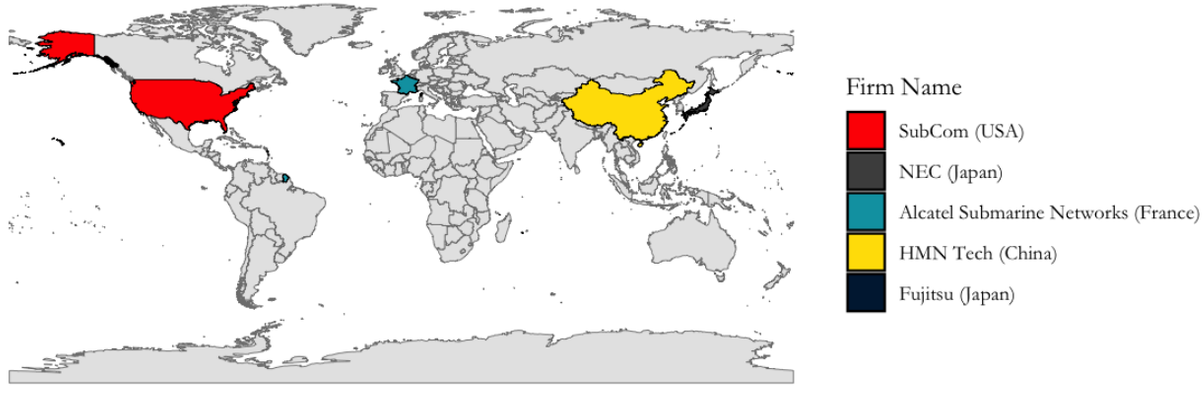
Figure 3.1: Global Firms Providing CCTV



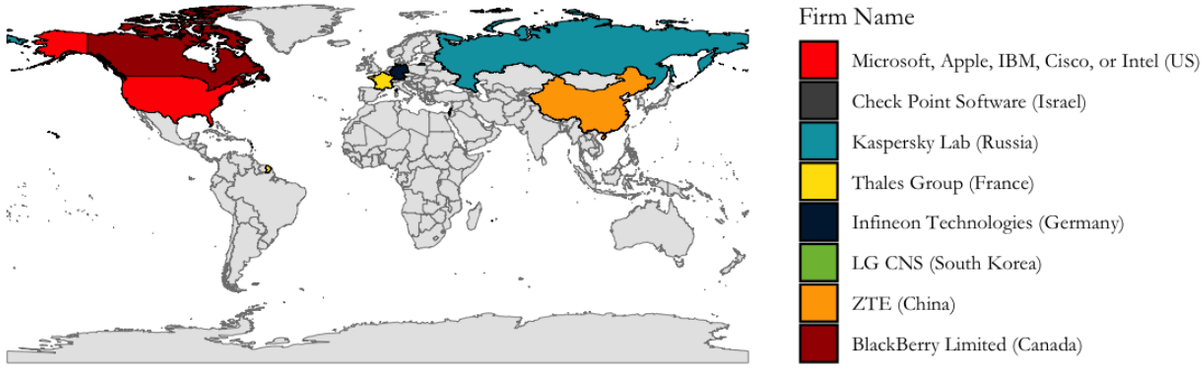
The same is true of a wide range of dual-use technologies, with empirical variation in the country producing these critical goods. Figure 3.2 illustrate the global reach and competitive nature of a range of strategically critical technologies, such as undersea cables, encryption technologies, and navigation systems.

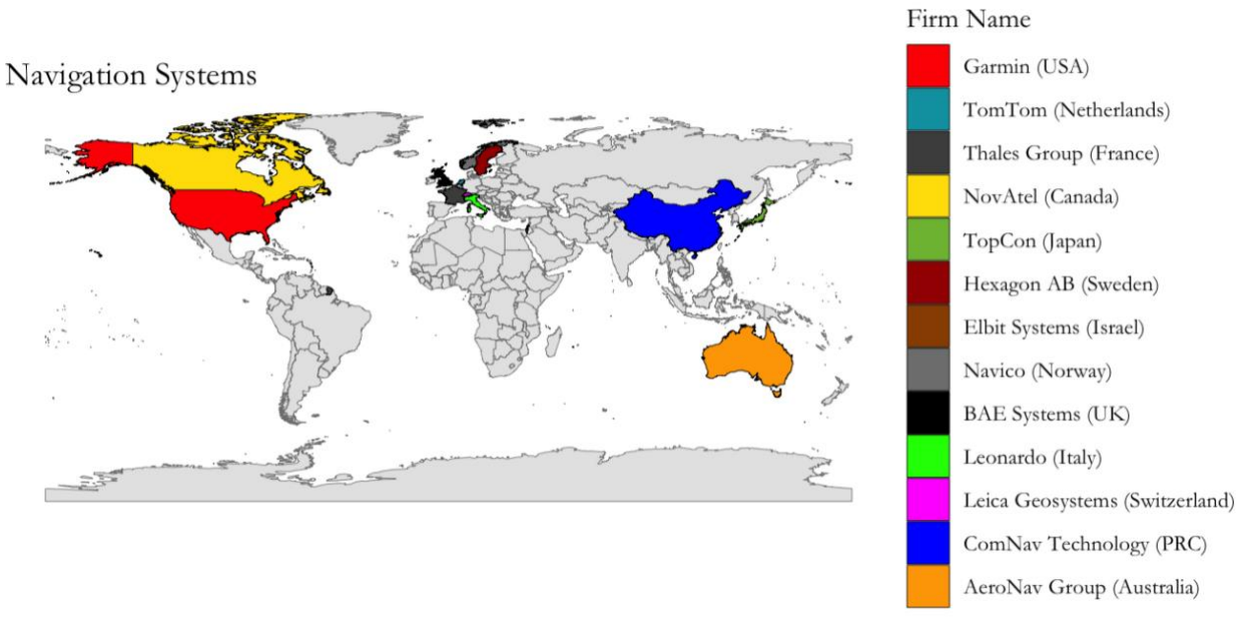
Figure 3.2: Sample of Global Firms Producing Key Dual-Use Technologies

Undersea Cables



Encryption Products





There are certainly dual-use technologies that are produced by commercial actors that have a monopoly on the market, with the most critical exception being various actors in the semiconductor industry. Taiwan Semiconductor Manufacturing Corporation (TSMC)'s 3 nanometer chips, for example, enjoy a monopoly over the most advanced fabrication of semiconductors, or Advanced Semiconductor Materials Lithography (ASML)'s lithography machines. Critical minerals represent another scarce input for dual-use technologies, the subject of increased policy scrutiny (UK's Critical Minerals Strategy 2022). The market dynamics for these goods should not detract from the general observation that for many dual-use technologies, there may be dozens of suppliers based across a wide range of economically advanced states. As such, price is a critical input for many dual-use technologies, thereby creating novel security-pocketbook trade-offs for policymakers and publics alike.

3. THE ROLE OF PUBLIC BEHAVIOUR, PREFERENCES, AND ATTITUDES. Public behavior, preferences, and attitudes can play a more important role in influencing business success, as well as trade and procurement patterns, from dual-use technologies compared to other strategically critical technologies. While public attitudes toward incorporating foreign technology are the most relevant mechanism studied in this paper, public behavior toward directly consuming technology and preferences for technology types and brands are related, critical variables that can influence decisions on trading and regulating critical technology.

First, publics may directly consume dual-use technologies, providing firms — and potentially the states in which the firms are based — with large amounts of data. The individual decision to download TikTok, for example, influences the amount of data ByteDance collects, which former ByteDance

employees have alleged PRC government officials can access and collect (Rodriguez 2021), and has been reviewed by the U.S. Committee on Foreign Investment (Reinsch et al. 2020), Irish Data Protection Commission (Data Protection Commission 2021), and Canada's Office of the Privacy Commissioner (McCallum 2023), among other legislative scrutiny. Second, from an economic perspective, consumers can influence the price and popularity of dual-use technologies from the demand side — if consumers do not like or purchase a given product, it may reduce their ability to compete in the market. Finally, and most importantly for the purposes of this theory, as publics become increasingly aware of the potential advantages and disadvantages of purchasing different technologies, they may act as an important consideration for policymakers who may decide whether they will regulate critical technologies. The public salience of debates on Huawei, Hikvision, and TikTok, among others, illustrates the increasingly important role the public might play in influencing foreign policy debates around dual use technologies.

Table 3.1 summarizes these critical overlaps between everyday goods and critically sensitive technologies. The first two rows, the presence of military applications and high levels of security sensitivity, reflect differences in strategic centrality. The following two rows — commerciality and number of suppliers — reflect supply-side dynamics that distinguish dual-use tech from critically sensitive technology. These distinctive security risks and supply-side markets result in varied reasons and logics for regulation (row 5), and consequently different types of security-pocketbook trade-offs thar both consumers and policymakers face (row 6). Examples of each type of good are included in the final row of the table.

Table 3.1: Dual-Use Technologies Exist at the Intersection of Everyday Goods and Critically Sensitive Technology

	Everyday Goods	Dual-Use Technology	Critically Sensitive Technologies
Military Applications	No	Yes	Yes
Security Sensitivity	Low	High	High
Commerciality and Public Consumption	Commercial and Consumed by Publics	Generally Commercial Consumed by Publics	Generally Non-Commercial and Not Consumed by Publics
Number of Suppliers	High	High	Low
Reason for Regulation	Volume of trade of goods; protect industries	Could be tied to volume of trade or desire to protect sensitive technologies (mix of everyday goods and critically sensitive tech)	Protect sensitive technologies; e.g. through export controls, entity lists, or inbound investment regulation
Presence of Security Pocketbook Trade-Off	Yes (By Virtue of Large Volume of Trade)	Yes (Influenced by Large Volume of Trade or Technical Concerns)	No
Examples	Agricultural and other food goods; textiles; household appliances; furniture; personal care products	Integrated circuits; surveillance equipment; navigation systems; encryption technologies; undersea cables; sensors; chemicals; critical minerals (e.g. silicon)	Stealth technology (e.g. F-35s); ballistic missiles; hypersonic weapons; high-energy lasers; nuclear weapons; directed-energy weapons

3.3.1 Theorizing About Public Attitudes Toward Friendshoring Dual-Use Technology

Having established the unique features of dual-use technology compared to everyday goods and other critically sensitive technologies, this section theorizes how variation in the 1) price of and 2) country producing dual-use technology influences public attitudes and preferences. This sub-section builds on foundational hypotheses about the importance of relative price and alliance dynamics to theorize about their intersection: alliance-based price elasticity.

Individuals would prefer dual-use technologies produced at home for a relatively cheap price, but in a globalized economy, foreign technologies are often cheaper than domestically produced ones, introducing a range of trade-offs that form the foundation of the security-pocketbook dilemma. The theory's building blocks are simple: lower prices are likely to win public favor, and the more closely aligned a bidding firm's foreign country is with the country they hope to supply the technology to, the more likely they are to win the bid. Imagine a simple choice between a domestic firm and a foreign firm. If priced equally, the domestic firm is likely to be preferred over the foreign firm. Firms located in allied countries are more likely to enjoy public support than firms in non-allied countries.

Thus, when countries decide to invest in critical technology and weigh bids from different firms that hope to serve as the supplier, in addition to the quality of the technology, two key factors are central to technological procurement: the *price* of the technology, and the *country* in which the firm producing the dual-use technology originates. The foundational roles of price and country of production for public attitudes toward dual-use technology leads to the following two hypotheses:

Relative Price Hypothesis: As the relative price of dual-use technology increases, relative preference for the dual-use technology will decrease.
Allies Over Adversaries Hypothesis: Publics will prefer dual-use technology produced by allied countries over dual-use technology produced by non-allied countries.

While the price of technology and country of production may be independently important variables in the security-pocketbook dilemma, it is possible that alliance dynamics directly influence the relative importance of price: depending on how close the security relationship is between the technology producing and purchasing countries, publics may be more or less sensitive to changes in price. For example, publics may be more sensitive to differences in price when the technology is produced by an allied power, reflecting that financial considerations may be relatively more important when there is little potential negative impact in the realm of national security, while security considerations are relatively more important when the supplying firm is based in a non-allied country. The differential effects of

country of origin on the effect of price leads to the following third hypothesis, which I refer to as alliance-based price elasticity:

Alliance-Based Elasticity Hypothesis: As the relative price of foreign dual-use technology decreases, publics will be more willing to substitute toward foreign-originated dual-use technology produced in an allied country compared to a non-allied country.

3.3.2 Scope Conditions

Three main areas of scope conditions are likely to apply to the theory outlined above: the country trading for or procuring the technology, the type and securitization of dual-use technology, and the effect of security risks accumulated elsewhere in the supply chain.

This theory applies to countries that meet two conditions. First, the country must have sufficient advanced productive capability. Second, these public constraints are more likely to influence policy outcomes in countries with strong accountability mechanisms like voting or protests, making my theory more applicable in democracies than autocracies.[7] Empirically, the states meeting these conditions are overlapping: currently most member states of the OECD in addition to Taiwan. Otherwise, states will lack an option to produce domestic technology comparable to foreign alternatives. Moreover, because China lacks allies that currently have the capability to produce these critically sensitive technologies at a high quality in mass, the empirical scope of this theory is likely constrained to the Western bloc.

Second, the empirical focus of this theory is constrained to finished goods as opposed to critical components in critical technologies, with the assumption that publics are broadly aware of heightened security risk in these cases. Dual-use technology is itself an expansive term. The negative application of these technologies could be in their direct use — such as is the case with CCTV cameras — or using a given technology as a critical input into another strategically critical technology, such as oil. While my empirical scope is limited to the former, security-pocketbook tradeoffs are also present in the latter, suggesting that alliance-based elasticity may travel to the contexts of many different dual-use technologies. As a critical extension of this, my theory assumes that some proportion of the public is broadly aware of the potential heightened risk from a dual-use technology and sees it as a more sensitive technology. As I show in my results, this assumption is supported empirically throughout my survey experiment, with many responses to many open-ended questions alluding to technical risks and drawing

[7] This condition is not strict, as public opinion can influence policy outcomes in authoritarian states. However, the effect will likely be stronger in democracies.

on real-life examples of sensitive technologies. However, for technologies with less obvious military applications, respondents may simply respond to them as if they were everyday goods.

Finally, the theory assumes that all security risks are accumulated at the level of finished goods and does not consider security risks potentially accumulated in supply chains. For example, my theory does not disaggregate between finished dual-use goods produced in one country, but with key components in the supply chain located elsewhere. While no respondents indicated concerns about added security risks through supply chains, suggesting it plays a highly limited role in public opinion, the security of goods within the supply chain is a critical question for policymakers to grapple with.

3.4 Methodology

To assess public attitudes toward incorporating foreign technology, I conducted a survey experiment of 1,793 participants living in the United Kingdom. Respondents read a vignette about a hypothetical procurement bidding process for surveillance cameras in public spaces, in which they were randomly assigned the supplying firm's originating country and the relative price of the procurement bid. I then exploit this variation to determine their effect on preferences for accepting a procurement bid through Ordinary Least Squares (OLS) regression analysis. Respondents were asked which offer they would choose.[89] The procurement setting was used instead of general trade for both theoretical and empirical reasons. Theoretically, the vignette was designed to induce a security-pocketbook trade-off, which is difficult to measure quantitatively in scenarios that focus on binary support/opposition to trade in general. The scenario while also designed to present a range of plausible technical security risks — such as surveillance and data exfiltration — that would have come from the very implementation of the cameras. Perhaps most importantly, empirically, UK policymakers were debating a new Procurement Bill at the time of the survey, which would overhaul pre-Brexit procurement regulations, making the scenario not just theoretically useful, but empirically representative of the real cases policymakers were dealing with at the time.

Beyond this procurement regulation specific context, the UK is an ideal country in which to study attitudes toward technical interdependence, both because it is in many ways a representative case for third countries navigating the middle of great power tech competition and confronting challenges with technical interdependence, and because it maintains methodological benefits for conducting such a survey. First, the UK is in many ways a *representative case* for many of the debates regarding technological

[8] Excluding Northern Ireland.
[9] Through the University of Oxford's University Omnibus scheme.

interdependence in economically advanced democracies. Beyond the Huawei debate; Parliament's scrutiny of a Chinese firm Nexperia's takeover of the British-owned Newport Wafer Fab (Pamilih 2022); the use of Hikvision and Dahua technologies; TikTok data collection methods; and dependence on critical minerals and subsequent opening of the UK's first Critical Minerals Intelligence Centre. These examples represent a marked change from the UK's previously open attitude toward Chinese foreign direct investment (FDI) in strategically critical sectors (Irwin Crookes and Farnell 2019), which was followed by the current era of fierce public debate on which foreign technologies should be traded for an incorporated in critical infrastructure. Beyond its theoretical utility, there are strong *methodological reasons* to prefer performing public opinion surveys in the UK. YouGov UK samples are high quality, with bias concerns minimized. The high quality of the survey provider therefore contributes to the survey's internal validity, making the UK a collectively ideal empirical case.

The UK, and London in particular, are presently home to many CCTV cameras, with the British Security Industry Authority (BISA) estimating in 2013 that there were 5.9 million cameras in the country (Barrett 2013). While the high volume and density of CCTV in the UK is unlikely to impact how respondents view trade-offs between domestic and various foreign providers, it does reflect that the UK may be more tolerant of surveillance than, for example, Germany, or other EU privacy-focused member states.

3.4.1 The Scenario: Video Cameras in Public Spaces

To assess attitudes toward technical risk, respondents were given a hypothetical scenario about a procurement decision for cameras for surveillance of public spaces. Respondents were initially told:

"Imagine the British government decides to purchase video cameras to engage in surveillance of public spaces throughout the country. They are considering buying cameras from a British firm, at a cost of [price] per unit. Before selecting the cameras, the government conducted a formal process to choose the supplier offering the best combination of quality and price."

Video cameras for public surveillance are likely a representative case for dual-use technology that 1) are commercially produced and partially publicly consumed, 2) have many possible suppliers, 3) contain a multitude of technical risks that create a security-pocketbook trade-off. While technical risks may vary across scenarios, video cameras provide a representative instance of respondents making trade-offs between security risks and cost-saving measures, the primary trade-offs this study focuses on. From the perspective of understanding technical risks, video cameras are also a relatively accessible instance for evaluating technical risks — respondents unconcerned about technical risks associated with video

cameras are unlikely to technical risks associated with smart cities or certain dual-use information and communication technologies.

This vignette also emphasizes that a formal process was conducted, and that the government is optimizing for price and quality. These concerns were mentioned to reduce concerns about corruption and associations with products produced in certain countries with higher or lower levels of quality. As a further robustness check, respondents were asked to evaluate the likely quality of the video cameras before responding to the vignette.

3.4.2 Explanatory Variables: Technology's Country of Origin and the Relative Price of Technology

In the previous section, I argued that decisions regarding incorporating foreign dual-use technologies are largely guided by three key considerations: relative price, country of origin, and quality. Because quality may be relatively subjective and difficult to weigh, I focus instead on variation in the country in which the firm providing technology is based and the price of the technology, controlling for quality by informing the respondent that the technology has passed the associated quality control checks. Variation in the key explanatory variables is as follows:

> *The Technology's Country of Origin*: In each scenario, the respondent must decide between the dual-use technology produced within the respondent's home country and a foreign country, with the foreign country varying between the United States and the PRC. A decision between the technology from home markets or great powers reflects a trade-off that middle powers often face as part of great power competition, thereby unearthing a critical dynamic within a great power competition framework. Moreover, from an empirical perspective, almost every middle or small power must decide whether to incorporate their technology confront, making these cases universal in the realness of the scenario. Finally, to get a more comprehensive overview of whether respondents prefer interactions with the U.S., PRC, or alternative states, I ask respondents at the end of the survey to rank their preferred country of purchase among the UK, US, China, Germany, and Russia. Technology's country of origin is thus a binary variable that takes on a value of 1 if the foreign technology is Chinese and 0 if the foreign technology is American.
>
> There are trade-offs associated with generalizability by including concrete actors — the U.S. and China — in the vignette (see, for example, Brutger et al. 2022). These design choices were made

for two reasons. Given that the goal of this experiment is partly to contribute to the literature's understanding of key dynamics of U.S.-China great power competition, evaluating how respondents react to concrete, real-life security-alliance dynamics is preferred to more abstract descriptions of alternatives.

Relative Price of the Dual-Use Technology: The relative price of the foreign technology varies across treatment groups, with the foreign-produced and home-produced technology equally priced for half of the respondents, and with foreign-produced 50 percent of the price of home-produced technology for the other half. Equally-priced technologies operate as a control, while the discount on the price of technology reflects the empirical reality that many states must choose between cheaper technologies produced abroad versus more expensive technologies produced at home. The relative price of technology is thus a binary variable that takes on a value of 1 if the discount is applied and 0 if it is not.

In practice, individuals carry little weight on procurement bids, and the inclusion of price in the vignette should not be interpreted in the narrow context of individuals making procurement decisions. Rather, price in this experiment serves as a proxy for the relative importance of pocketbook considerations for publics compared to other concerns, such as national security. Substantial variation in the degree to which price differences reflect preferences are sufficient to illustrate the general theory that market dynamics are more important when comparing technologies produced by allies than adversaries.

Table 3.3 shows the four treatment groups, which are divided as follows:

Table 3.3: Distribution of Respondents Across Treatment Groups

	US	**China**
Same Price	US and UK-produced cameras equally priced, n = 457	China and UK-produced cameras equally priced, n = 447
50% Discount	US-produced cameras cost half the price of UK-produced cameras, n = 426	China-produced cameras cost half the price of UK-produced cameras, n = 463

3.4.3 The Dependent Variable: Preferences for Purchasing and Incorporating Dual-Use Technology

The dependent variable of interest is preferences for purchasing and incorporating foreign dual-use technology. To determine this variable, respondents were asked, "*Now imagine the British government considers purchasing video cameras produced by a [foreign country] firm, at a cost of [price] per unit. They are the same quality as the British video cameras. Which of the following comes closest to your view*?*"* Respondents choose among five options: the British firm, the foreign firm, indifferent between the offers, the government should not buy the cameras at all, and do not know. This variable is initially coded as a binary variable, with 1 representing a desire to buy British, 0 representing a preference for buying foreign, and all other responses excluded. As a key robustness check, I code this variable in different ways to ensure results were not driven by these coding decisions. The full survey is available in Appendix B.

3.4.4 Regression Specification

To measure the effect of country on preferences, I run OLS regressions measuring the effect on country and relative price on preference for buying British. The regression for the conditional effect is given as:[10]

$Y_i = \beta_0 + \beta_1 Country_i + \beta_2 RelativePrice_i + \beta_3 Country_i * RelativePrice_i + X + \boldsymbol{\varepsilon}$, where Y is the stated preferred bid for incorporating dual-use technology, Country reflects random treatment assignment to either the U.S. or China, $\beta_3 Country_i * RelativePrice_i$ is the interaction effect between country and relative price, X is a vector of controls, and $\boldsymbol{\varepsilon}$ is the error term. In each case, I provide regressions both with and without controls to show the robustness of my results.

Where pre-treatment controls were included, they were included in the regression on the basis they could theoretically impact the outcome variable of interest. Because YouGov's participants were chosen to be balanced across these covariates they are not strictly necessary; however, from a methodological perspective, including them here minimizes standard errors. These variables are age, gender, region, social grade, education, gross household income, ethnicity, marital status, work status, whether the respondent voted in the 2019 general election, their stated vote in the 2019 general election, their vote in the UK's EU referendum, and the relative urbaneness of their constituency.

As a further pre-treatment consideration, I vary the *absolute price* of the video cameras in the vignette, with cameras produced domestically costing either £200 or £100. By controlling for absolute price, I ensure that respondents did not make decisions based on absolute price, as opposed to relative price or country considerations.

[10] Bivariate regressions subject to same treatment variables, controls, and other regression specifications.

3.4.5 Getting to the Mechanism: Descriptive Statistics and Subsets

While the regression analysis is useful to establish the statistical significance of country and price for preferences toward incorporating dual-use technology, including subsets and performing textual analysis, can allow for moving beyond establishing the relationship but get closer to establishing the mechanism. First, I include descriptive statistics showing the breakdown of responses to preferences to incorporating dual-use technology divided according to assignment to treatment group. This allows for the primary domestic/foreign technology statistical analysis to be contextualized with responses for preferring no technology or indifference toward incorporating technology. In addition to the descriptive analysis, I also subset the price regression according to country, illustrating the differential effects that prices have on dual-use technology preferences when the foreign alternative originates from the U.S. as opposed to the PRC. I consider the generalizability of the results by showing respondent ranked preferences for British, American, and Chinese dual-use technology along with German and Russian technology, while also showing respondent reported reference points from the vignette.

3.5.1 Robustness Checks and Experiment Pre-Registration

Robustness checks were performed to ensure the validity of results. For internal validity, three factors may threaten the validity of my results: 1) the possibility that respondents made decisions based on their associations with the quality of products produced in a given country, 2) that the vignette made respondents think about real-life cases and made decisions about details that are unaccounted for by the vignette, and 3) that respondents preferred not to incorporate the cameras at all, or 4) that respondents made decisions based on the absolute cost of video cameras. The possibility of point one occurring is minimized by emphasizing that the government conducted a formal process to choose bids based on quality and price considerations, and by performing a manipulation check to estimate respondent perceptions of the likely quality of the technology. Second, to account for the possibility that real-life cases influenced respondents' answers, respondents were asked, "*Did the situation described previously make you think of any real-life examples you have heard about in the news? If yes, please specify the examples it made you think of.*" Asking this question allows for an analysis of whether respondents who thought about particular cases systematically preferred incorporating home or foreign ICT at a rate different compared to those who simply made decisions based on the details in the vignette alone. To minimize the possibility that respondents preferred no technology to either home or foreign-produced technology, respondents were able to select that they would prefer neither procurement bid. While preference for neither bid is unlikely to be affected by either the relative price of technology or the foreign firm's country, including this option allows for the descriptive measurement of technological aversion. Finally, to ensure respondents

are not making decisions based on absolute costs as opposed to relative costs, I include the cost of the cameras as a control variable.

Finally, survey-measurement factors could influence my results, specifically resulting from measurement error, the order of responses, attrition, or lack of statistical power. *Measurement error* concerns the possibility results are impacted by the regression specification, coding of dependent variable, or specification of standard errors. To address these threats to inference, I include a series of robustness checks, including re-specifying the regressions as binary logit when OLS is used and incorporating heteroskedastic standard errors. Respondents might also have been influenced by the order of responses, preferring to choose the firm option shown; to minimize this risk, the order of response options was randomized. Another possible problem in the survey is *non-response attrition* — individuals systematically do not respond to a question or series of questions, which distorts measurement of the outcome. To mitigate this possibility, I include a "do not know" option for each survey question. A final concern comes from the possibility the survey might be *underpowered*. To mitigate this possibility, a power analysis was conducted as part of the survey's pre-analysis plan, which is included in Appendix A.

The primary hypotheses, heterogeneous treatment effects, and subsets were pre-registered and analyzed in accordance with a pre-analysis plan. The full pre-analysis plan is included in the Appendix.

3.5 Results

In this section I present the results of my regression analysis. In both bivariate and multivariate analyses, the country in which technology is produced, the cost of foreign dual-use technology, and the interaction between the two are statistically significant predictors of respondent preferences for incorporating foreign dual-use technology at the 95 percent confidence level, providing strong evidence that perception of security risk affects demand-side price elasticity. This relationship is further illustrated by comparing the effect of price of foreign technology on respondent preferences for buying British when the datasets are subsetted by the country producing foreign technology: in the multivariate case, offering a 50% discount on American technology led to an average 21 percent decrease in the probability that the respondent would prefer buying British, while the same scenario with an technology produced in the PRC led to on average an only 7 percent decrease in the probability that the respondent would prefer buying British.

Figure 3.3 shows descriptively the distribution in the dependent variable of interest — preferred bid — based on assignment to treatment group. While this chart does not show causal relationships, it is useful

to get a sense of the distribution in responses across treatments. Across all treatment groups, buying British technology received a plurality of respondent votes, though the magnitude of the plurality varied across treatment groups. Interestingly, the second greatest number of responses was for purchasing neither technology, with more than 26 percent of respondents selecting this option in each of the four treatment groups, illustrating a significant portion of the UK-population opposes the incorporation of technology regardless of its provider.

Figure 3.3: Distribution of Preferred Procurement Bid According to Treatment Group

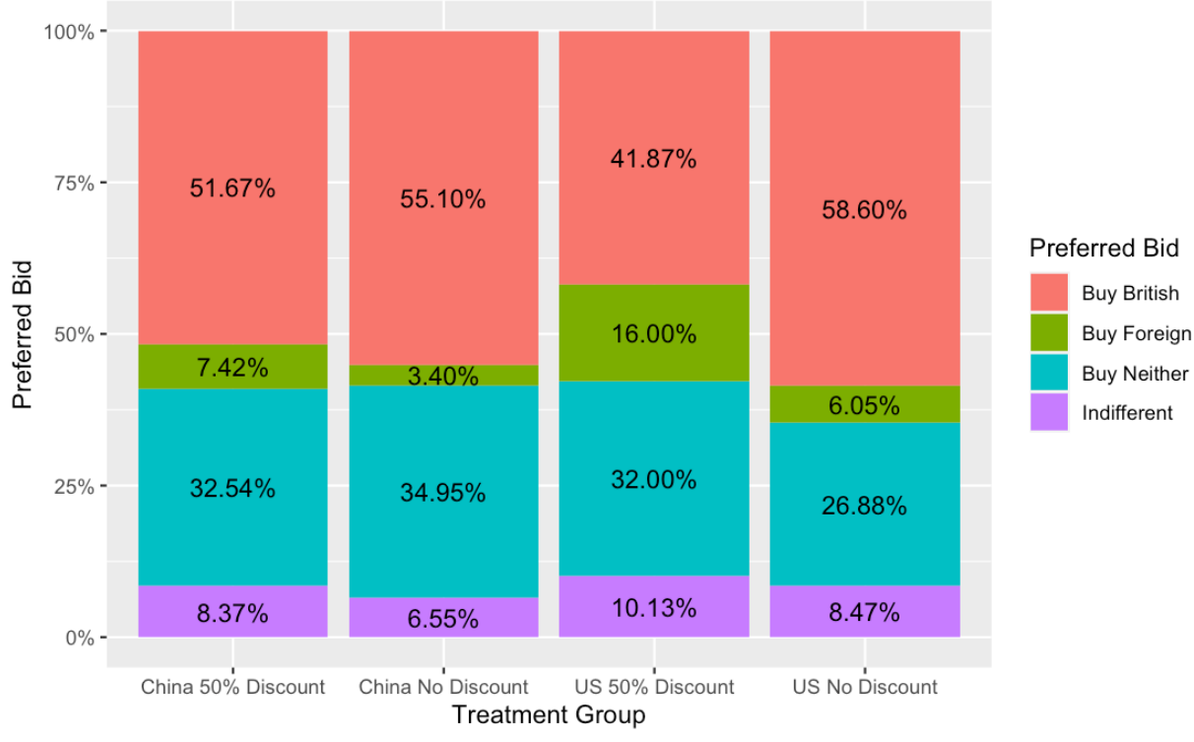


Table 3.4 illustrates how variation in the country in which the video cameras were produced and variation in the price of the foreign technology — as well as the interaction of the two — affected preferences for the British procurement bid. In the bivariate regression, assignment to the U.S. vignette as opposed to the PRC vignette in the bivariate regression (model 1) led to an average .083 unit decrease in the probability that the respondent preferred the British to foreign technology, statistically significant at the 99 percent confidence level. The multivariate regression (model 4) produced similarly significant results, with an estimated .080 unit decrease in the probability that the respondent preferred the British to foreign technology. While British respondents are more willing to substitute away from British technology when the alternative is American compared to when it is Chinese, in either case, respondents' baseline preference for buying British is high, indicated by the constant in the regression table — nearly 91% in China vignette and 83% in US vignette. Price was a similarly statistically significant predictor of

preference, with assignment to a vignette with a no discount on foreign technology, as opposed to a 50% discount on foreign technology relative to the British technology, led to an average .119 unit increase in the probability that the respondent preferred the foreign technology in the bivariate case (model 2), with similar results for the multivariate model (model 5, coefficient of .133).

The most theoretically interesting results came in in the model exploring the interaction between country and price, with the interaction term of country and price a statistically significant predictor of preference for a British bid (models 3 and 6). These models show that respondent responsiveness to changes in prices in foreign ICT are conditioned by the country providing the alternative technology. Thus, respondents are relatively more price elastic when deciding between dual-use technology produced by an allied country compared to technology produced by a non-allied country.

Table 3.4: Determinants of Preferences for Incorporating Dual-Use Technology

	Preference for British Bid					
	buy_british					
	Bivariate	Bivariate	Bivariate	Multivariate	Multivariate	Multivariate
	(1)	(2)	(3)	(4)	(5)	(6)
US Bid	−0.083***		−0.151***	−0.080***		−0.143***
	(0.022)		(0.031)	(0.029)		(0.040)
No Discount		0.119***	0.067**		0.133***	0.083**
		(0.022)	(0.030)		(0.029)	(0.040)
US Bid*No Disc.			0.115***			0.110*
			(0.043)			(0.056)
Constant	0.908***	0.804***	0.874***	0.879***	0.605**	0.671**
	(0.015)	(0.016)	(0.021)	(0.296)	(0.296)	(0.293)
Observations	972	972	972	588	588	588
R^2	0.015	0.031	0.055	0.082	0.104	0.126
Adjusted R^2	0.014	0.030	0.053	0.007	0.031	0.052
Note:						*p<0.1; **p<0.05; ***p<0.01

This key result can be further seen when the dataset was subsetted based on whether the respondent was assigned to the U.S. or China vignette and measuring the effect of variation in price on preference for dual-use technology, shown in Table 3.5. The foreign discount was statistically significant at the 95 percent confidence level in both cases, but it matters far more in the U.S. vignette (.183 in bivariate model 1 and .214 in multivariate model 3) than the PRC vignette (.067 in bivariate model 2 and .069 in multivariate model 4) [11]. Interpreting the multivariate model, when respondents were choosing between

[11] The multivariate model for China is only significant at the 90 percent confidence level.

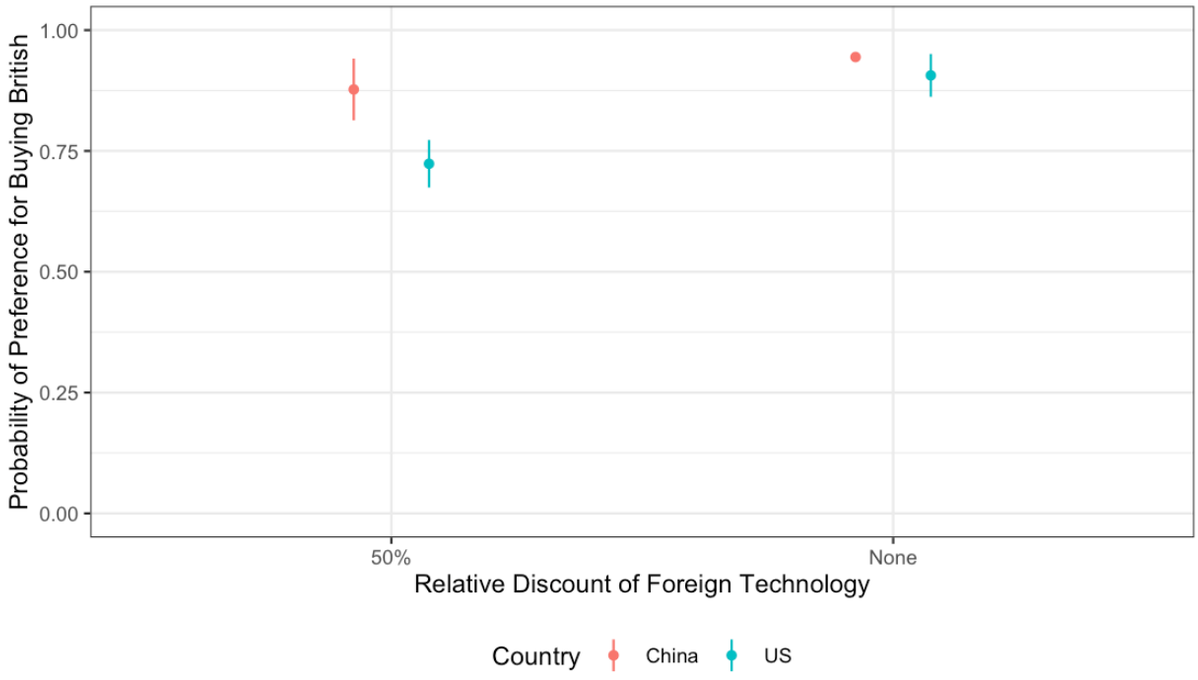
British or American technology, the effect of price is large: offering a 50 percent discount resulted in a 21.4 percent decrease in the probability that the respondent would choose the British technology. Offering the same discount but from a firm based in the PRC held far less sway on British publics, with only 6.9 percent substituting away from the British bid when offered a 50 percent discount on Chinese technology. Collectively, these results show that preferences are more price elastic when deciding respondents must choose between technology produced in a home and allied country, and providing preliminary support that national security concerns may condition responsiveness to price considerations.

Table 3.5: Determinants of Preferences for Incorporating Dual-Use Technology: Subsets by Foreign Bid Country

	Preference for British Bid			
	buy_british			
	Bivariate US	Bivariate China Subset	Multivariate US Subset	Multivariate China Subset
	(1)	(2)	(3)	(4)
No Discount	0.183***	0.067**	0.214***	0.069*
	(0.034)	(0.026)	(0.045)	(0.037)
Constant	0.724***	0.874***	0.460	0.625
	(0.025)	(0.018)	(0.469)	(0.455)
Observations	484	488	300	288
R^2	0.057	0.014	0.221	0.171
Adjusted R^2	0.055	0.012	0.087	0.021
Note:				*p<0.1; **p<0.05; ***p<0.01

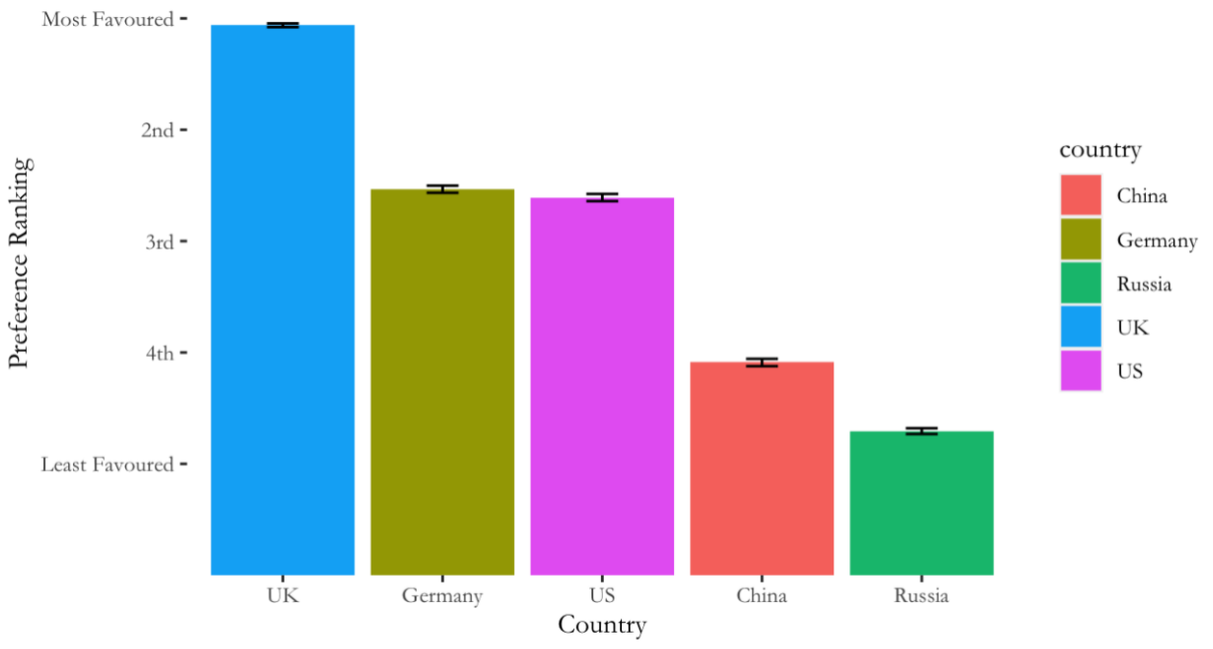
The difference in the magnitude of these effects can be seen through the predicted probability chart highlighted in Figure 3.4. Respondents receiving the PRC vignette are shown in red, those receiving the U.S. vignette in blue. 95 percent confidence intervals are indicated by the vertical lines on the chart. American dual-use technology is systematically preferred to PRC technology, demonstrated by the PRC technology routinely higher than the American technology (though when there is no discount on foreign technology US and PRC technology are within the same margin of error). The key effect, however, is reflected in the difference of the slope between the red dots and blue dots — the blue dots show a much more vertical slope compared to the red dots, reflecting the relatively greater price elasticity when respondents were presented with a US as opposed to a PRC alternative.

Figure 3.4: Effect of Relative Cost of Foreign ICT on Preferences



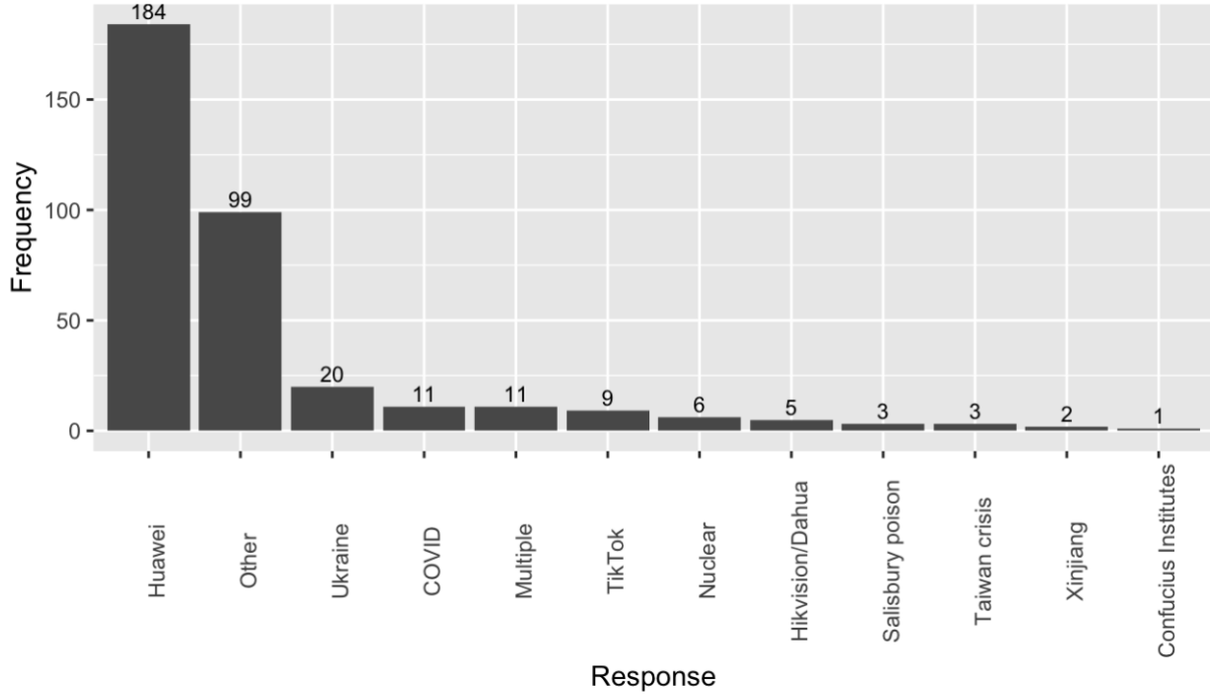
A key question that follows is whether respondents are particularly amenable to procuring goods from the U.S. or particularly averse to procuring goods from China. To better understand the order of their preferences, respondents were asked to rank the countries from which they would like to procure goods from a list that also included Germany and Russia. A clear hierarchy emerged from the list, shown in Figure 3.5, with near universal preference for British goods. German goods were slightly preferred but on par with US, consistently ranked either second or third. The least preferred tier had Chinese goods — generally ranked fourth overall — and Russian goods, ranked last. As such, had the vignette included either Germany or Russia in it — countries with significant economic and political power — the magnitude of the effect would likely have been even larger.

Figure 3.5: Respondent Ranked Preferences for Country



One potential threat to the ability to infer the effect of country and price on responses for British goods is if respondents were systematically influenced by real-life examples. Figure 3.6 shows the distribution of responses to real-life examples respondents thought of when they saw the hypothetical, with 1,439 not responding or responding "no" (80.3 percent) and 354 responding "yes" (19.7 percent). The greatest reference point by far was debates in the UK around Huawei, indicated by either an explicit mention to the firm or to 5G technologies, with 117 respondents mentioning related topics when treated with the China vignette and 67 respondents doing the same in the U.S. vignette. Other China-specific mentions included China's COVID response (11), TikTok (9), investment in the UK's nuclear industry (6), CCTV cameras or firms like Hikvision or Dahua (5), a potential Taiwan crisis (3), concerns around minority rights in Xinjiang (2), and Confucius Institutes (1). Additional responses mentioned Russia issues, such as the invasion of Ukraine, or in some cases, multiple of the above, with a roughly even distribution across all topics.

Figure 3.6: Distribution of Real-Life Examples



As table 3.6 shows, those who did think of a real-life example may have been more likely to prefer British dual-use technology, but this does not seem to be driven by relating the vignette to real-life China cases, or the most frequent China-related case of Huawei/5G. In fact, the statistically significant relationship appears only in the U.S. subset but not the China subset, and no statistical relationship between mentions of Huawei and preference for buying British in any of the subsets. Thus, recalling a real-life example may have had a small effect on preferences for the small number of individuals who mentioned them, but this seems unrelated to China-specific cases like Huawei.

Given the range of real-life cases respondents drew on, the survey results also suggest that the presence of micro-level friendshoring and alliance-based price elasticity should not be taken as evidence that publics have a deep understanding of variation in the levels and type of security risk based on the actor providing the technology, that publics understand the economic consequences of protectionism (which extant research suggests they do not) (Rho and Tomz 2017), nor should it be used to suggest that publics are highly attuned to specific debates around regulating procurement or investment of dual-use technology at the policymaker level. However, the results do suggest that publics make sense of complicated international events using publicly salient news issues.

Table 3.6: Effect of Thinking of Real-Life Example on Preference for Buying British

	Preference for British Bid					
	buy_british					
	All	US Subset	China Subset	All	US Subset	China Subset
	(1)	(2)	(3)	(4)	(5)	(6)
Any Real-Life Example	0.065**	0.095**	0.035			
	(0.027)	(0.043)	(0.033)			
Huawei				0.047	0.036	0.038
				(0.035)	(0.062)	(0.038)
Constant	0.839***	0.786***	0.893***	0.861***	0.821***	0.903***
	(0.014)	(0.022)	(0.017)	(0.012)	(0.018)	(0.014)
Observations	860	431	429	972	484	488
R^2	0.007	0.011	0.003	0.002	0.001	0.002
Adjusted R^2	0.005	0.009	0.0003	0.001	−0.001	−0.00004
Note:						*p<0.1; **p<0.05; ***p<0.01

My main results hold when subjected to a series of robustness checks. To ensure that the results were not affected by the OLS regression specification, regressions were re-run using a binary logit model, with odds ratios displayed in Table 3.7. All results were statistically significant at the 99 percent confidence level, providing support of this section's main findings.

Table 3.7: Robustness Check: Binary Logit (Main Analysis)

	Preference for British Bid			
	buy_british			
	Bivariate	Multivariate	Bivariate	Multivariate
	(1)	(2)	(3)	(4)
US Bid	−0.741***	−0.789***		
	(0.197)	(0.274)		
No Discount			1.076***	1.378***
			(0.204)	(0.300)
Constant	2.287***	17.715	1.411***	15.394
	(0.156)	(1,389.685)	(0.117)	(1,344.959)
Observations	972	588	972	588
Log Likelihood	−375.031	−202.805	−367.242	−195.257
Akaike Inf. Crit.	754.062	495.609	738.485	480.515
Note:				*p<0.1; **p<0.05; ***p<0.01

Because binary logit regressions cannot take interaction terms, I test whether respondents respond differently to changes in price using subsets by country, displayed in Table 3.8. The key finding — that

respondents in the U.S. vignette are more responsive to changes in price than those in the PRC vignette — holds as well, illustrated by the significantly larger coefficient in the U.S. subset compared to the PRC subset. Price was statistically significant in the U.S. subset at the 99 percent confidence level, while price was statistically significant in the PRC subset in both the bivariate (95 percent confidence level) and multivariate (90 percent confidence level) models.

Table 3.8: Robustness Check: Binary Logit (Subsets)

	Preference for British Bid			
	buy_british			
	Bivariate US	Bivariate China	Multivariate US	Multivariate China
	(1)	(2)	(3)	(4)
No Discount	1.308***	0.845**	2.131***	1.078*
	(0.259)	(0.336)	(0.471)	(0.567)
Constant	0.962***	1.941***	15.060	49.780
	(0.152)	(0.192)	(3,735.359)	(13,701.830)
Observations	484	488	300	288
Log Likelihood	−210.947	−146.731	−95.323	−62.236
Akaike Inf. Crit.	425.894	297.462	280.646	214.472
Note:				*p<0.1; **p<0.05; ***p<0.01

Another possible threat to inference is that respondents did not accept that the quality was constant in the treatment. To account for this possibility, I coded open-ended responses asking respondents why they responded the way they did for any mention of quality differences. Only 12 respondents (0.7 percent) indicated any difference in quality influencing their decision — including varying perceptions on the relative quality of technology produced in China, US, and UK.[12] Pew surveys corroborate the probability these findings will hold, with over 70 percent of British respondents stating they saw both U.S. and Chinese technologies as above average or best compared to other wealthy nations, and a majority of respondents in 10 of 12 countries surveyed stating they believed Chinese technology was well made (Silver et al. 2023). Similarly, respondents may have responded due to concerns about the environmental impact of transporting goods over long distances. 31 respondents (1.7 percent) made any reference to climate or environmental concerns such as carbon emissions, the effect of transportation on the environment, and general statements about environmental friendliness.

3.5.1 External Validity

[12] In contrast, 68 respondents *explicitly* noted that quality was the same or similar across cameras.

For external validity, two further factors may threaten my results. The first is timing: as the survey was conducted in August 2022 during the UK's prime minister leadership race between Liz Truss and Rishi Sunak, both candidates pushed for policies that were widely seen as more hawkish compared to the Golden Era under Boris Johnson (Singer and Hogg 2022). While definitely a temporal peak of hawkishness at the time, the UK's relationship toward China has grown increasingly hawkish in the time after the survey was conducted, epitomized by Liz Truss' declaration that China represents a threat (Grylls 2022), an attack on a Hong Kong protestor outside of the Chinese consulate (Kuo and Chiang 2022), and the arrest of a British journalist covering the A4 protests in Beijing (Deaton 2022). Thus, it is likely that a similar survey conducted in the months and years following would yield even stronger effects on the country variable. Second, there may be characteristics specific to the UK population that make generalizing preferences — and rationales for those preferences — more difficult. For example, it is theoretically possible that respondents in the UK might be relatively more hostile to China compared to other Western European countries. However, policies aimed at decreasing dependence on China have occurred simultaneously and occurred across Europe. As such, the British public likely provides a reasonable starting point for conducting comparative analysis with other Western European countries and beyond.

3.6 Conclusion

Third countries wedged in the middle of U.S.-China great power competition face a key choice when deciding what dual-use technology to incorporate into their critical infrastructures: prioritize national security or narrowly optimize for price considerations. How policymakers decide with which countries to trade dual-use technology may structure alliance dynamics, expand technological networks and hierarchies, and shape great power competition in critical battleground third countries. And unlike other strategically critical technologies, this battle is taking place not just in defense ministries but across newspapers op-eds, primetime news shows, outdoor protests, and coffee shop conversations in cities like London, Sydney, and Tokyo. What the public thinks could therefore significantly shape the trade patterns and regulation of these critical technologies. And unlike other strategically critical technologies, countries really do have a choice about where to buy technologies from.

I show that the security considerations condition the relative influence of price considerations on preferences for dual-use technology: consumer preference for domestic-produced technology is more price elastic when the alternative foreign dual-use technology is produced by an allied country as opposed to a non-allied one, illustrating the presence of alliance-based price elasticity. This willingness to securitize these sensitive technologies at a significant economic cost — a 50 percent discount across all

cameras — shows the public is theoretically ready to endure significant economic cost to optimize for security.

After consulting with several China-facing Parliamentary staffers and civil society members in the UK on a regular basis to better understand the most pressing issues in the UK's policy pipeline, I designed a novel survey experiment to analyze both how publics weighed country of origin and relative price considerations. Through this survey, I show that the interaction of country and price is a statistically significant predictor of preference for buying home-produced dual-use technology at the 95 percent confidence level, suggesting that the relative impact of price changes depends on the foreign country supplying the bid. When subsetted by country, the stark difference in the effect of price on bid preferences becomes clear: offering a 50 percent discount on US-produced technology resulted in a 21.4 percent decrease in the probability the respondent would prefer British technology, with only a 6.9 percent decrease when the respondent was choosing between British and Chinese technology.

This paper makes important theoretical, empirical, and policy contributions. First, this paper is a first mover in theorizing on the theoretical relationship between country and price for thinking through the unique ways unique security, commercial, and public opinion dynamics shape the market for dual-use goods. I then provide a theory to explain the relationship at the micro-level — alliance-based price elasticity — showing that the role of security considerations conditions the importance of price — adding key microfoundations to our understanding of friendshoring and providing an empirical test of the theory. Finally, this paper makes a critical policy contribution by measuring the public pulse on these issues at a critical juncture.

This paper also provides several avenues for further research. First, research should test whether these findings hold outside of a Western European context, as well as outside of a video camera-specific vignette. In the UK context, the country's "special relationship" with the U.S. and "systemic competition" with China clearly define levels of country friendliness, but how do countries truly stuck in the middle, or more aligned with the PRC, evaluate this security-pocketbook tradeoff? And while these results should hold across a range of dual-use technologies, empirical tests illustrating this would support the external validity of the key findings. Further research could also relax the assumption of public applications for dual-use goods, comparing how public preferences for public goods, as in this hypothetical, versus foreign-produced private technology. Third, research should explore not just how publics adjudicate between security and pocketbook considerations, but also compare this to elite preferences, as well as seeking to understanding how public preferences influence those of elites. Along

these lines, further research should also seek to establish variation in public and elite preferences for different policy instruments regulating economic interdependence. Lastly, further research could explore how public attitudes vary with respect to different dual-use technology characteristics, including their technical architecture, connection to economic chokepoints, location in the production supply chain, and the nature of their regulation.

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Appendix A: Pre-Analysis Plan

"Technically It's Risky: Public Risk Perception of Technological Interdependence"

Pre-Analysis Plan
7 August 2022

Introduction

What factors influence perceptions of risk in incorporating technology developed by foreign actors? Given the interconnected nature of global information and communication technology (ICT) systems, all states — but most acutely small and middle powers — rely on technologies produced by other countries to enhance critical infrastructures, presenting a range of tradeoffs in both the national security and economic spheres. Yet we know little about how publics outside of the great powers weigh these tradeoffs and which forms of risk are the most salient drivers of their preferences. This is a big omission, since publics can play an important constraining role on elected policymakers (Tomz et al. 2020), including those tasked with regulating the procurement of critical technologies.

Foreign dependencies in the technological sphere have become publicly salient debates within economically advanced democracies, specifically in the context of whether to ban Huawei's 5G networks (Segal 2021). Debates on whether, and under what conditions, to allow foreign entities involved in critical supply chains or providing critical infrastructures still unsettled in Germany, Japan, and the United Kingdom. A wide range of potential risks — some economic, some based on value incompatibility, and some conditioned by the nature of technology itself — may play disproportionate roles in driving attitudes toward national security risk.

Disaggregating among different source of risks associated with incorporating foreign technology is critical for two reasons. First, a failure to precisely conceptualize sources of risk in incorporating foreign technology makes it difficult to create policies that effectively counter and mitigate them. Those who advocate for banning a technology on the basis of human rights concerns need to create policy mechanisms that not only define human rights, but also explain the range of ways in which they might be threatened. Human rights concerns could include, for example, the use of forced labor to produce the technology, the use of the technology to engage in a range of forms of repression, or that purchasing technology from a state committing human rights abuses will contribute to the regime's economic viability. Addressing each of these risks would require a distinctive policy instrument. Second, risk levels may vary along two key dimensions: the structure of the technology and the country providing the technology. Understanding how these two dimensions create variation in risk levels is central to both creating targeted, effective policies and avoiding heightened risks associated with over-securitization.

Studying public attitudes toward integrating foreign technologies is critical for two further reasons. First, because voters influence the policymaking process, they also become a key source of inefficiency in policymaking — e.g. voter perception that risks are more salient than they actually are may lead to over-regulation to appease voter demand. Second, in some cases, everyday people have agency to decide

whether to incorporate a foreign technology in their daily lives. Individuals concerned that TikTok was sending data back to the Chinese government could choose not to install and use the app.

Further Motivation

While concerns about incorporating foreign technologies may have been initially prompted by debates on Huawei, they have begun to take place across a range of countries and debates. The EU has begun to pursue a policy of "digital sovereignty," a path which began largely due to fears of increasing isolationism during the Trump era in the United States. The perception that Europe needs to be autonomous in critical supply chains, such as through the EU's proposed European Chips Act, which reflected on the vulnerabilities Europe faced as a result of "extreme global dependency of the semiconductor value chain on a very limited number of actors in a complex geopolitical context" (European Commission 2022). These fears have been exacerbated by the Russian invasion of Ukraine, with Europeans feeling the economic effects of Western sanctions imposed on Russia. European states have also been increasing technological regulation on the national level. For example, Italy's FDI screening mechanism — called "Golden Power" — has now been used thrice to prevent China from acquiring Italian technology firms (Arcesati and Ghiretti 2022).

The UK, a representative case for many of these debates regarding technological interdependence in economically advanced democracies, has witnessed an increase in concerns regarding Britain's technological interdependence. This can be seen through Parliament's scrutiny of a Chinese firm Nexperia's takeover of the British-owned Newport Wafer Fab (Pamilih 2022), use of Hikvision and Dahua technologies, and dependence on critical minerals (Pamilih and Cash 2021) and subsequent opening of the UK's first Critical Minerals Intelligence Centre all demonstrate the growing public salience of technological interdependence in the UK.

Deciding whether to incorporate and how to best regulate these technologies is far from black and white. These technologies can promote sustainability measures, create new jobs in capital intensive industries, and enhance and improve existing technologies. But incorporating technology also carries significant risk, ranging from the potential of technological lock-in effects to data transfers to malicious actors. Thus, this survey seeks to figure out how people weigh trade-offs associated with incorporating foreign technology, and their willingness to purchase technology from foreign countries, even if they have security concerns.

Theoretical Underpinnings

I plan to evaluate within the context of three logics:[13]

1) **Baseline risks:** concerns about incorporating technology within a domestic context (e.g. whether incorporating the technology is worth the cost, concerns about privacy in a domestic context, concerns about data transfer back to the government).

[13] Terminology of these logics subject to change in final paper based on conference and reviewer feedback.

2) **Dependence risks:** those which come from lack of self-sufficiency and are inspired by the desire to have full control over critical technology. These risks could include fear of general economic dependence or weaponized interdependence (Farrell and Newman 2019), the possibility of foreign governments engaging in espionage, or data flowing to a country's government.
3) **Country-specific risks**: risks which fluctuate based on which country the technology is purchased from. For example, concerns about values might depend on whether a regime is democratic or authoritarian. Other risks, such as data exfiltration, might be influenced by how closely firms work with the government.

These risks can be further disaggregated into three additional categories:

1) **Technical risks**: those related to themes like hacking, data exfiltration, and privacy
2) **Economic risks**: related to impact of dependence on domestic industry,
3) **Value risks:** related to issues such as human rights abuses in supply chains, dealing with comprehensive

While my survey does not evaluate all potential versions of these concerns explicitly, it includes questions capturing all of these dimensions. Moreover, this framework provides a foundation upon which to evaluate the open-ended question I include in my survey.

Hypotheses

I separate my hypotheses into specific hypotheses, heterogeneous treatment effects, and "general things to look for." The purpose of these hypotheses is to provide a framework for what I'm thinking for and provide a foundation for my analysis. However, as Olken (2015) notes, analyzing data is also an exploratory process and important discoveries can happen after working with the data. I list a few (but not all) of the things I'll be interested in looking at in the "general things to investigate" to reflect potentially interesting further avenues to investigate.

The primary hypotheses are:

- **H1**: Respondents will see greater national security risk in incorporating Chinese technology compared to American technology. *The other tests are designed to get at the mechanism driving these concerns.*
    - **H1a**: Respondents who receive the China vignette will be less likely to prefer to buy foreign cameras compared to those in the US vignette.
- **H4**: As the cost of foreign technology decreases, preference for foreign technology will increase.

Several additional hypotheses are designed to get at various mechanisms of interest:

Specific Hypotheses

Country-Specific Hypothesis

- **H1**: Respondents will see greater national security risk in incorporating Chinese technology compared to American technology.
    - **H1a**: Respondents who receive the China vignette will be less likely to prefer to buy foreign cameras compared to those in the US vignette.[14]
- **H2**: Risks associated with incorporating foreign technology will vary based on the firm country.
    - **H2a**: Respondents in the China vignette will be more likely to express concerns related to data flows, dependence, while those receiving the US vignette will be more likely to vocalize broad concerns about the technology.

Domestic Preference Hypothesis

- **H3**: When cost of domestic and foreign-produced technology is the same, respondents will prefer buying domestic over buying foreign.[15]
    - **H3a**: When cost of domestic and foreign-produced technology is the same, respondents will prefer buying domestic over buying foreign.

- **H4**: As the cost of foreign technology decreases, preference for foreign technology will increase.
    - **H4a**: This will be especially true for the subset that perceives national security risk to be low.
    - **H4b**: But could still hold for the group that perceives national security risk to be high. If it did, it would suggest they're ultimately pocketbook voters.

Disaggregating National Security, Economics, and Local Crime

- **H5**: As perceived benefit to national security decreases, so will probability that respondent either prefers buying British or not buying the technology at all (check separately and together).
    - **H5a**: As perceived benefit to the UK's tech industry decreases, so will probability that respondent either prefers buying British or not buying the technology at all (check separately and together).
    - **H5b:** As perceived benefit to ability to combat crime decreases, so will probability that respondent either prefers buying British or not buying the technology at all (check separately and together).

Country Preferences

- **H6:** Generally expect preference for UK, US, or Germany over China and Russia
    - **H6a**: Those who see national security risk in US vignette will be more likely to prefer 1) UK and 2) Germany to US
    - **H6b**: Those who see national security risk in China vignette will be more likely to prefer Russia to China

Heterogeneous Treatment Effects

Privacy Concerns

[14] This variable is given as the dummy variable: 1 if foreign, 0 otherwise.
[15] Same as in H1a and all other hypotheses involving question 4 outcome variable. Re-specification is robustness check.

- **H7:** As a respondent's concern for privacy in general increases, they will be more likely to see national security risk in both contexts.
    - **H7a:** Increased concern for privacy, interacted with the Chinese vignette, will be more likely to see national security risk.
    - **H7b**: As concern for privacy increases, a given respondent's stated preference for European (German) technology will also increase.

Xenophobia, Race, and Ethnicity

- **H8**: As a respondent's reported level of xenophobia increases, they will be more likely to prefer buying British; see national security risk in Chinese treatment see national security risk in Chinese treatment.
    - **H8a:** If a respondent is white, they be will more likely to prefer buying British; see national security risk in Chinese treatment.

Perceived Firm-Government Closeness

- **H9:** As levels of perceived firm-government closeness increases, perceptions of national security risk will be heightened in the Chinese vignette.

Political Attention

- **H10**: As reported political attention of respondents increases, so too will the probability that they will prefer to buy British; see national security risk when they receive the Chinese treatment.

Party Affiliation

- **H11**: Conservative voters will more likely to prefer buying British; see national security risk in incorporating Chinese tech compared to American tech.
    - **H11a**: Lib Dem voters will be least likely to prefer buying British; see national security risk in incorporating Chinese tech compared to American tech.

EU Referendum Vote

- **H12**: Leavers will be more likely to prefer buying British; see national security risk in Chinese vignette. $buy\_british \sim EU\_ref*chinese\_vign + EU\_ref + chinese\_vign + X$

Analyzing Open-Ended Response

- **H14**: I expect those in the 50% cost for foreign technology group to emphasize economic logics more than than those in the 100% cost group, who I think will be more likely to emphasize national security or domestic-preference arguments.
- **H15**: Classification based on nature of concerns (see theoretical underpinnings and .

General Things to Investigate (No Specific Predictions)

- Quantitative Text Analysis on open-response question:
- Descriptive statistics looking at which risks people think are most salient
- Generally look for predictors for which risks people will think are most important

- Consider cluster and other ML analysis tools to understand risks mentioned in US vs. Chinese vignette
- Consider heterogenous treatment effects with all available control variables
- Run subsets based on firm country

Logic of the Survey and Questions

The survey is designed to tease out differences in perceptions of security risk based on the country in which a certain critical technology is produced, the foundations of those beliefs, and whether economic trade-off logics can be sufficient to change people's preferences regarding purchasing foreign technology.

The first two questions of the survey are meant to assess potential mediating factors for responses later in the survey — privacy attitudes and xenophobia.

The privacy attitudes variable is measured through the question — "How willing are you, if at all, to share your personal information with the following?" — for friends and family, the UK government, and other countries' governments, respectively. Respondents choose from very willing, fairly willing, neither willing nor unwilling, not very willing, not willing at all, or don't know.[16] I measure the variable as continuous, using the average of the three as the "privacy" variable.

The xenophobic attitudes[17] variable is measured through the question — "How comfortable or uncomfortable would you feel if each of the following were to move in next door to you?" — for friends and family, the UK government, and other countries' governments, respectively. Iran was chosen as a country seen as generally hostile to the UK without inducing respondents to think immediately of China before treatment. Respondents choose from very comfortable (5)[18], quite comfortable (4), neither comfortable nor uncomfortable (3), not very comfortable (2), and not comfortable at all (1). I measure the variable as continuous, subtracting the score given to the response on an "immigrant family originating from Iran" from the score given to "elderly people," divided by 4. So if a person was very comfortable with an elderly person moving in, but very uncomfortable with an immigrant family from Iran moving in, their xenophobia score would be (5-1)/4 = 1, If they were quite comfortable for both, their xenophobia score would be (4-4)/4 = 0.

Question 3 asks respondents:

> *"Imagine the British government decides to purchase video cameras to engage in surveillance in public spaces throughout the country. They are considering buying cameras from a British firm, at a cost of* ***[£200/£100]*** *per unit. Before selecting the cameras, the government conducted a formal process to choose the supplier offering the best*

[16] For a given question, a response of "do not know" results in exclusion from the sample.
[17] There is a robust debate in the literature on the differences between xenophobia and other forms of prejudice — I'll discuss this in the article itself, but for now am using the term "xenophobia" as the current measure.
[18] Numbers here reflect calculation used in xenophobia variable.

combination of quality and price. The cameras passed an official government quality control check. Do you think the government should or should not buy these video cameras?"

They are given a binary option of should/should not, or don't know. The purpose of this question is to get a baseline idea of whether respondents support purchasing the camera, and whether this is influenced by the cost of the cameras.

Question 4 is the beginning of the heart of the survey, asking respondents to compare offers from a British firm and a foreign firm: either an American (50%) or Chinese firm (50%). For half of the respondents, the cost of the foreign technology is half the price as the British technology. Respondents choose among: buying the British video cameras, buying the foreign video cameras, the government should buy the cameras but indifferent between the offers, and the government should not buy the video cameras. The main DV to emerge from this section is whether the government should buy the British cameras. Question 5 is an open-ended question asking respondents why they responded the way they did to the previous question, allowing for a range of quantitative text analysis of the responses.

Question 6 and 7 disaggregate the different motivations offered in question 4 and try to get to the heart of what drives attitudes toward incorporating foreign technology: "Imagine the British government decides to purchase the video cameras produced by a [US/Chinese] firm. If this were to take place, do you think this would have a positive or negative impact on each of the following?" — with the UK's national security, the UK's tech industry, and the UK's ability to combat crime three dimensions upon which to evaluate the impact of the policy. In question 7, a series of risks are outlined, with respondents asked to choose up to their three biggest concerns: Hacking from people from [the US/China]; Personal data being shared with the [US/Chinese] government; Possibility that [US/Chinese] government is using cameras to spy on everyday people; Possibility that UK government is using cameras to spy on everyday people; Not wanting the cost of buying the cameras; Working conditions of people in the production process; Britain becoming too dependent on the US/China; Other {please specify}. The vector of risks included in question 7 is defined as *R*.

Questions 8 and 10 are designed to assess whether respondents' views were influenced by either perceptions of how closely the government works to private firms or were otherwise influenced by current affairs.

Finally, Question 9 asks respondents to rank their preferred trading partner country among the UK, US, Germany, China, and Russia. Each country is treated as its own output for the ranking it received, given by the vector *C*.

Survey Sample

This survey will be run in August 2022 through YouGov's University Omnibus Survey at the University of Oxford. 1,600 participants in Great Britain (excluding Northern Ireland) will be surveyed, balanced across the demographic factors I control for. Aside from the exclusion of Northern Irish voters, the survey should therefore be a representative sample of the UK population, but balance tests will be performed to ensure this is the case.

Controls

To determine which controls to include in my regression, I will use Bayesian Additive Regression Trees (BART), inputting the variables below, all of which were collected pre-treatment:

Demographics

- Age
- Gender
- Region
- Social Grade
- Education Level
- Household Income (ordered categories)
- Ethnicity
- Religion
- Marital Status
- Work Status
- Voted in 2019?
- Party Voted For in 2019
- EU Referendum Vote
- Political Attention
- ONS Urban

*Treatment Assignments**

- *Price of Video Cameras in Vignette*

In the regressions below, the variables chosen in each model will be given as "X."

Regression Specification

Default in each case will be Ordinary Least Squares (OLS) regression with robust standard errors. For each hypothesis, the regression is specified as follows:

Country-Specific Hypothesis

- **H1**: Respondents will see greater national security risk in incorporating Chinese technology compared to American technology. $national\_security\_risk \sim chinese\_vign + X$
- **H1a**: Respondents who receive the China vignette will be less likely to prefer to buy foreign cameras compared to those in the US vignette. $national\_security\_risk \sim buy\_british + X$

- **H2**: Risks associated with incorporating foreign technology will vary based on the firm country. $R \sim chinese\_vign + X$

- **H2a**: Respondents in the China vignette will be more likely to express concerns related to data flows, dependence, while those receiving the US vignette will be more likely to vocalize broad concerns about the technology. *Same regression specification as above*

Domestic Preference Hypothesis

- **H3**: When cost of domestic and foreign-produced technology is the same, respondents will prefer buying domestic over buying foreign. *No regression specification — check distribution of results, subset: camera_cost = full*
    - **H3a**: When cost of domestic and foreign-produced technology is the same, respondents will prefer buying domestic over buying foreign even more when the foreign firm is Chinese. *buy_british ~ chinese_vign + X, subset: camera_cost = full*

- **H4**: As the cost of foreign technology decreases, preference for foreign technology will increase. *buy_british ~ camera_cost + X*
    - **H4a**: This will be especially true for the subset that perceives national security risk to be low. *buy_british ~ camera_cost + X, subset: nat_sec_risk = high*
    - **H4b**: But could still hold for the group that perceives national security risk to be high. If it did, it would suggest they're ultimately pocketbook voters. *buy_british ~ camera_cost + X, subset: nat_sec_risk = low*

Disaggregating National Security, Economics, and Local Crime

- **H5**: As perceived benefit to national security decreases, so will probability that respondent either prefers buying British or not buying the technology at all (check separately and together). *buy_british ~ nat_sec_risk + X; buy_none ~ nat_sec_risk + X*
    - **H5a**: As perceived benefit to the UK's tech industry decreases, so will probability that respondent either prefers buying British or not buying the technology at all (check separately and together). *buy_british ~ tech_industry + X; buy_none ~ tech_industry + X*
    - **H5b:** As perceived benefit to ability to combat crime decreases, so will probability that respondent either prefers buying British or not buying the technology at all (check separately and together). *buy_british ~ tech_industry + X; buy_none ~ tech_industry + X*

Country Preferences

- **H6:** Generally expect preference for UK, US, or Germany over China and Russia — *evaluate using descriptive statistics*
    - **H6a**: Those who see national security risk in US vignette will be more likely to prefer 1) UK and 2) Germany to US. *C ~ nat_sec_risk + X, subset, vignette = usa_vign*
    - **H6b**: Those who see national security risk in China vignette will be more likely to prefer Russia to China. *C ~ nat_sec_risk + X, subset, vignette = usa_vign*

Heterogeneous Treatment Effects

Privacy Concerns

- **H7:** As a respondent's concern for privacy in general increases, they will be more likely to see national security risk in both contexts. *nat_sec_risk ~ privacy + X*

- **H7a:** Increased concern for privacy, interacted with the Chinese vignette, will be more likely to see national security risk. *nat_sec_risk ~ privacy*chinese_vign + privacy + Chinese_vign + X*
- **H7b**: As concern for privacy increases, a given respondent's stated preference for European (German) technology will also increase. *germany_pref ~ privacy + X*

Xenophobia and Ethnicity

- **H8**: As a respondent's reported level of xenophobia increases, they will be more likely to prefer buying British; see national security risk in Chinese treatment see national security risk in Chinese treatment. *buy_british ~ xenophobia*chinese_vign + xenophobia + chinese_vign + X; nat_sec_risk ~ xenophobia*chinese_vign + xenophobia + chinese_vign + X*
  - **H8a:** If a respondent is white, they be will more likely to prefer buying British; see national security risk in Chinese treatment. *buy_british ~ white*chinese_vign + white + chinese_vign + X; nat_sec_risk ~ white*chinese_vign + white + chinese_vign + X*

Perceived Firm-Government Closeness

- **H9:** As levels of perceived firm-government closeness increases, perceptions of national security risk will be heightened in the Chinese vignette. *nat_sec_risk ~ firm_gov_closeness*chinese_vign + firm_gov_closeness + chinese_vign + X*
  - **H9a:** As levels of perceived firm-government closeness increases, the probability that a respondent is concerned about data-related risks also increases. *data_risks ~ firm_gov_closeness + X*

Political Attention

- **H10**: As reported political attention of respondents increases, so too will the probability that they will prefer to buy British; see national security risk when they receive the Chinese treatment. *buy_british ~ chinese_vign*pol_attn + chinese_vign + pol_attn + X; nat_sec_risk ~ chinese_vign*pol_attn + chinese_vign + pol_attn + X*

Party Affiliation

- **H11**: Conservative voters will more likely to prefer buying British; see national security risk in incorporating Chinese tech compared to American tech. *buy_british ~ chinese_vign*vote2019 + chinese_vign + vote2019 + X; nat_sec_risk ~ chinese_vign* vote2019 + chinese_vign + vote2019 + X*
- **H11a**: Lib Dem voters will be least likely to prefer buying British; see national security risk in incorporating Chinese tech compared to American tech. *buy_british ~ chinese_vign*vote2019 + chinese_vign + vote2019 + X; nat_sec_risk ~ chinese_vign* vote2019 + chinese_vign + vote2019 + X*

EU Referendum Vote

- **H12**: Leavers will be more likely to prefer buying British; see national security risk in Chinese vignette. *buy_british ~ EU_ref*chinese_vign + EU_ref + chinese_vign + X*

Ethics

This survey received ethical approval through the University of Oxford Central University Ethics Committee (CUREC) in August 2022.

Threats to Inference

I consider the following threats to inference in my survey.

1. **Measurement Error**
    a. **Problem:** Measurement errors due to regression specification, coding of DVs, or standard errors.
    b. **Solution:** Run addition regressions using ordered/binary logit, introduce machine learning techniques, re-code DVs to be binary; use heteroskedasticity-robust standard errors.
2. **Contemporary Case Bias**
    a. **Problem:** Respondent is thinking of a contemporary case that colors their responses, not controlled for within the vignette.
    b. **Solution**: Ask respondent if this is present, see which cases are most salient, and identify if there are any trends in the data based on answer to this question that is systematically influencing results. Run regressions again by removing those who responded "Yes" to being reminded of a present example (Q10).
3. **Country-Based Biases**
    a. **Problem:** Responses based on perception of the quality of products the country produces (e.g. a potential belief that Chinese goods are cheaper and of worse quality).
    b. **Solution:** Include in the vignette that the government is choosing cameras based on quality and price, and that a quality control check was performed.
4. **Technology Aversion**
    a. **Problem:** Respondents will oppose incorporating the technology regardless of who is providing it (including home country).
    b. **Solution:** Provide baseline scenario, ask whether certain domestic technical risks is a significant factor influencing decisions.
5. **Decisions Based on Cost of Video Cameras**
    a. **Problem:** Respondents might be sensitive to the cost of the video cameras.
    b. **Solution:** Vary whether the cost of the cameras is £100 or £200, ask whether firm cost is a significant factor influencing decisions.
6. **Order of Responses**
    a. **Problem:** Respondents might simply choose the first answer option shown.
    b. **Solution:** Randomize the order of the response option shown.
7. **Attrition:**
    a. **Problem:** systematic non-response due to respondents not understanding the question due to technical difficulties.
    b. **Solution:** I include a "do not know" option and filter out irrelevant responses to my open-ended question.
8. **Power:**

a. **Problem:** The survey could be under-powered.
b. **Solution:** Power analysis included in following section.

Power Analysis[19]

Treatment Effect Size	SD of Outcome Variable	# of Subjects to Achieve 80% Power
0.05	0.2	503
0.1	0.2	126
0.3	0.2	14
0.1	0.5	785
0.3	0.5	88
0.5	0.5	32
0.75	0.5	14
0.15	1	1396
0.2	1	785
0.3	1	349
0.5	1	126
0.75	1	56
1	1	32
0.25	1.5	1131
0.5	1.5	283
0.75	1.5	126
0.3	2	1396
0.5	2	503
0.75	2	224
1	2	126

Robustness Checks[20]

1. Run balance tests: regress each pre-treatment covariate on assignment to 1) US or China, 2) £100 or £200 initial camera price, and 3) whether cost of foreign camera is 50% or 100% of the initial camera price.
2. When DV is binary — re-run as binary logit.
3. When DV is ordered categorical — re-run as ordered logit.
4. Check that results aren't influenced by whether respondent was assigned to £100 or £200 initial treatment.
5. When outcome variable asks about question 4 — measure preference for buying British instead of preference for buying foreign.

[19] Calculated using EGAP Shiny App (https://egap.shinyapps.io/power-app/).
[20] Additional robustness checks may be run depending on conference/reviewer feedback.

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Appendix B: Survey Experiment

```
{page scott_splits1}

{
split_SINGER_COST=random(1,2)
}

{end page scott_splits1}

{page scott_splits2}
{
split_SINGER_COUNTRY=random(1,2)
}
{end page scott_splits2}
{page scott_splits3}
{
split_SINGER_COST_200=random(1,2)
}
{end page scott_splits3}
{page scott_splits4}
{
split_SINGER_COST_100=random(1,2)
}

{end page scott_splits4}

[SS1] {grid roworder=randomize} How willing are you, if at all, to share your
personal information with the following?
-[SS1_1] Friends and family
-[SS1_2] The UK government
-[SS1_3] Other countries' governments
<1> Very willing
<2> Fairly willing
<3> Neither willing nor unwilling
<4> Not very willing
<5> Not willing at all

[SS2] {grid roworder=randomize} How comfortable or uncomfortable would you feel
if each of the following were to move in next door to you?
-[SS2_1] An immigrant family originating from Iran
-[SS2_2] Same-sex couple
-[SS2_3] Elderly people
<1> Very comfortable
<2> Quite comfortable
<3> Neither comfortable nor uncomfortable
<4> Quite uncomfortable
<5> Very uncomfortable

[SS3_a if split_SINGER_COST==1] Imagine the British government decides to
purchase video cameras to engage in surveillance of public spaces throughout the
country.<<br>><<br>>They are considering buying cameras from a British firm, at a
cost of £200 per unit.<<br>><<br>>Before selecting the cameras, the government
conducted a formal process to choose the supplier offering the best combination
of quality and price. The cameras passed an official government quality control
check.<<br>><<br>> Do you think the government should or should not buy these
video cameras?
<1> Should
<2> Should not
<3> Don’t know
```

```
[SS3_b if split_SINGER_COST==2] Imagine the British government decides to
purchase video cameras to engage in surveillance of public spaces throughout the
country.<<br>><<br>>They are considering buying cameras from a British firm, at a
cost of £100 per unit.<<br>><<br>>Before selecting the cameras, the government
conducted a formal process to choose the supplier offering the best combination
of quality and price. The cameras passed an official government quality control
check.<<br>><<br>> Do you think the government should or should not buy these
video cameras?
<1> Should
<2> Should not
<3> Don't know

#US -- 4 splits
{module US if split_SINGER_COUNTRY==1}

#if they saw £200 (25%)
[SS_US_200_200 if split_SINGER_COST==1 and split_SINGER_COST_200==1] Now imagine
the British government considers purchasing video cameras produced by a US firm,
at a cost of £200 per unit. They are the same quality as the British video
cameras.<<br>><<br>>Which of the following comes closest to your view?
<1> The government should buy the British video cameras for £200 each.
<2> The government should buy the US video cameras for £200 each.
<3> The government should buy video cameras, but I am indifferent between the
two offers.
<4> The government should not buy video cameras.
<5> Don't know

#if they saw £200 (25%)
[SS_US_200_100 if split_SINGER_COST==1 and split_SINGER_COST_200==2] Now imagine
the British government considers purchasing video cameras produced by a US firm,
at a cost of £100 per unit. They are the same quality as the British video
cameras.<<br>><<br>>Which of the following comes closest to your view?
<1> The government should buy the British video cameras for £200 each.
<2> The government should buy the US video cameras for £100 each.
<3> The government should buy video cameras, but I am indifferent between the
two offers.
<4> The government should not buy video cameras.
<5> Don't know

#if they saw £100 (25%)
[SS_US_100_100 if split_SINGER_COST==2 and split_SINGER_COST_100==1] Now imagine
the British government considers purchasing video cameras produced by an US firm,
at a cost of £100 per unit. They are the same quality as the British video
cameras.<<br>><<br>>Which of the following comes closest to your view?
<1> The government should buy the British video cameras for £100 each.
<2> The government should buy the US video cameras for £100 each.
<3> The government should buy video cameras, but I am indifferent between the
two offers.
<4> The government should not buy video cameras.
<5> Don't know

#if they saw £100 (25%)
[SS_US_100_50 if split_SINGER_COST==2 and split_SINGER_COST_100==2] Now imagine
the British government considers purchasing video cameras produced by a US firm,
at a cost of £50 per unit. They are the same quality as the British video
cameras.<<br>><<br>>Which of the following comes closest to your view?
<1> The government should buy the British video cameras for £100 each.
<2> The government should buy the US video cameras for £50 each.
```

```
<3> The government should buy video cameras, but I am indifferent between the
two offers.
<4> The government should not buy video cameras.
<5> Don't know

{end module US}

[SS5_US_British if ((SS_US_200_200==1) or (SS_US_200_100==1) or
(SS_US_100_100==1) or (SS_US_100_50==1))] {open rows=5 cols=60 dk=1} You
previously said that you thought the British government should buy the British
video cameras. Why do you think that?

[SS5_US_US if ((SS_US_200_200==2) or (SS_US_200_100==2) or (SS_US_100_100==2) or
(SS_US_100_50==2))] {open rows=5 cols=60 dk=1} You previously said that you
thought the British government should buy the US video cameras. Why do you think
that?

[SS5_US_Indifferent if ((SS_US_200_200==3) or (SS_US_200_100==3) or
(SS_US_100_100==3) or (SS_US_100_50==3))] {open rows=5 cols=60 dk=1} You
previously said that you are indifferent as to whether the British Government
buys the British or US video cameras. Why do you think that?

[SS5_US_None if ((SS_US_200_200==4) or (SS_US_200_100==4) or (SS_US_100_100==4)
or (SS_US_100_50==4))] {open rows=5 cols=60 dk=1} You previously said that you
thought the British government should not buy any video cameras. Why do you think
that?

#CHINA -- 4 splits
{module CHINA if split_SINGER_COUNTRY==2}

#if they saw £200 (25%)
[SS_China_200_200 if split_SINGER_COST==1 and split_SINGER_COST_200==1] Now
imagine the British government considers purchasing video cameras produced by a
Chinese firm, at a cost of £200 per unit. They are the same quality as the
British video cameras.<<br>><<br>>Which of the following comes closest to your
view?
<1> The government should buy the British video cameras for £200 each.
<2> The government should buy the Chinese video cameras for £200 each.
<3> The government should buy video cameras, but I am indifferent between the
two offers.
<4> The government should not buy video cameras.
<5> Don't know

#if they saw £200 (25%)
[SS_China_200_100 if split_SINGER_COST==1 and split_SINGER_COST_200==2] Now
imagine the British government considers purchasing video cameras produced by a
Chinese firm, at a cost of £100 per unit. They are the same quality as the
British video cameras.<<br>><<br>>Which of the following comes closest to your
view?
<1> The government should buy the British video cameras for £200 each.
<2> The government should buy the Chinese video cameras for £100 each.
<3> The government should buy video cameras, but I am indifferent between the
two offers.
<4> The government should not buy video cameras.
<5> Don't know

#if they saw £100 (25%)
[SS_China_100_100 if split_SINGER_COST==2 and split_SINGER_COST_100==1] Now
imagine the British government considers purchasing video cameras produced by a
Chinese firm, at a cost of £100 per unit. They are the same quality as the
```

British video cameras.<
><
>Which of the following comes closest to your view?
<1> The government should buy the British video cameras for £100 each.
<2> The government should buy the Chinese video cameras for £100 each.
<3> The government should buy video cameras, but I am indifferent between the two offers.
<4> The government should not buy video cameras.
<5> Don't know

#if they saw £100 (25%)
[**SS_China_100_50** if split_SINGER_COST==2 and split_SINGER_COST_100==2] Now imagine the British government considers purchasing video cameras produced by a Chinese firm, at a cost of £50 per unit. They are the same quality as the British video cameras.<
><
>Which of the following comes closest to your view?
<1> The government should buy the British video cameras for £100 each.
<2> The government should buy the Chinese video cameras for £50 each.
<3> The government should buy video cameras, but I am indifferent between the two offers.
<4> The government should not buy video cameras.
<5> Don't know

{**end module** CHINA}

[**SS5_China_British** if ((SS_China_200_200==1) or (SS_China_200_100==1) or (SS_China_100_100==1) or (SS_China_100_50==1))] {**open** rows=5 cols=60 dk=1} You previously said that you thought the British government should buy the British video cameras. Why do you think that?

[**SS5_China_Chinese** if ((SS_China_200_200==2) or (SS_China_200_100==2) or (SS_China_100_100==2) or (SS_China_100_50==2))] {**open** rows=5 cols=60 dk=1} You previously said that you thought the British government should buy the Chinese video cameras. Why do you think that?

[**SS5_China_Indifferent** if ((SS_China_200_200==3) or (SS_China_200_100==3) or (SS_China_100_100==3) or (SS_China_100_50==3))] {**open** rows=5 cols=60 dk=1} You previously said that you are indifferent as to whether the British Government buys the British or Chinese video cameras. Why do you think that?

[**SS5_China_None** if ((SS_China_200_200==4) or (SS_China_200_100==4) or (SS_China_100_100==4) or (SS_China_100_50==4))] {**open** rows=5 cols=60 dk=1} You previously said that you thought the British government should not buy any video cameras. Why do you think that?

{**module** US_follow if split_SINGER_COUNTRY==1}
[**SS6_USx**] {**grid** roworder=randomize} Imagine the British government decides to purchase the video cameras produced by a US firm. If this were to take place, do you think this would have a positive or negative impact on each of the following?
-[SS6_US_1x] The UK's national security
-[SS6_US_2x] The UK's tech industry
-[SS6_US_3x] The UK's ability to combat crime
<1> Very positive
<2> Fairly positive
<3> Neither positive nor negative
<4> Fairly negative
<5> Very negative
<6> Don't know

[**SS7_US**] {**multiple** order=randomize max=3} Which of the following would you be MOST concerned about happening if the government decided to buy the video cameras from the US? Please select up to 3.
<1> Hacking from people from the US
<2> Personal data being shared with the US government
<3> Possibility that US government is using cameras to spy on everyday people
<4> Possibility that UK government is using cameras to spy on everyday people
<5> Not wanting the cost of buying the cameras
<6> Working conditions of people in the production process
<7> Britain becoming too dependent on the US
<8 fixed> Other [SS7_US_o]{**open**}
<9 fixed xor> Not applicable -- I wouldn't have any concerns
<10 fixed xor> Don't know

[**SS8_US**] How closely tied, if at all, do you think the US firm is to the US government? Please answer on a scale of 1 to 7, where 1 is 'not closely tied at all' and 7 is 'very closely tied'.
<1> 1 - Not closely tied at all
<2> 2
<3> 3
<4> 4
<5> 5
<6> 6
<7> 7 - Very closely tied
<8> Don't know

{**end module** US_follow}

{**module** China_follow if split_SINGER_COUNTRY==2}

[**SS6_Chinax** if split_SINGER_COUNTRY==2] {**grid** roworder=randomize} Imagine the British government decides to purchase the video cameras produced by a Chinese firm. If this were to take place, do you think this would have a positive or negative impact on each of the following?
-[SS6_China_1x] The UK's national security
-[SS6_China_2x] The UK's economic prospects
-[SS6_China_3x] Your personal safety in your community
<1> Very positive
<2> Fairly positive
<3> Neither positive nor negative
<4> Fairly negative
<5> Very negative
<6> Don't know

[**SS7_China**] {**multiple** order=randomize max=3} Which of the following would you be MOST concerned about happening if the government decided to buy the video cameras from China? Please select up to 3.
<1> Hacking from people from China
<2> Personal data being shared with the Chinese government
<3> Possibility that Chinese government is using cameras to spy on everyday people
<4> Possibility that UK government is using cameras to spy on everyday people
<5> Not wanting the cost of buying the cameras
<6> Working conditions of people in the production process
<7> Britain becoming too dependent on the China
<8 fixed> Other [SS7_China_o]{**open**}
<9 fixed xor> Not applicable -- I wouldn't have any concerns
<10 fixed xor> Don't know

[**SS8_China**] How closely tied, if at all, do you think the Chinese firm is to the Chinese government? Please answer on a scale of 1 to 7, where 1 is 'not closely tied at all' and 7 is 'very closely tied'.
<1> 1 - Not closely tied at all
<2> 2
<3> 3
<4> 4
<5> 5
<6> 6
<7> 7 - Very closely tied
<8> Don't know

{**end module** China_follow}

[**SS9**] {**rank** slots=5 dk=1} If the video cameras were the same price and quality, from which of the following countries' firm would you prefer the UK buy video cameras? Please rank from 1 to 5, where 1 is most preferred and 5 is least preferred.
<1> A US firm
<2> A British firm
<3> A Chinese firm
<4> A German firm
<5> A Russian firm

[**SS10**] Did the situation described previously make you think of any real-life examples you have heard about in the news? If yes, please specify the examples it made you think of.
<1> Yes [SS10_o] {**open** rows=1 cols=60}
<2> No
<3> Don't know

Appendix C: Pre-Treatment Variables

Table 5.C1: Pre-treatment variables

Variable	**Coding Rule**
Age	Continuous
Gender	Binary — 1 if male, 0 otherwise
Region	Categorical
Social Grade	Binary — 1 if ABC1, 0 if C2DE
Education	Binary — 1 if university degree, 0 if no university degree
Gross Household Income	Binary — 1 if above £70,000 per year, 0 otherwise
Ethnicity	Binary — 1 if British, 0 otherwise
Marital Status	Categorical
Work Status	Categorical
Voted in 2019?	Binary — 1 if yes, 0 if no
Past Vote in 2019?	Categorical
Past Vote in EU Referendum?	Categorical
ONS Urban?	Categorical

Chapter 4

The Rally-Around-the-Chips Effect: How Public Opinion Makes or Breaks Emerging Technology Chokepoints

Abstract

Weaponized interdependence highlights that states benefit from control over key emerging technology chokepoints. Yet chokepoint maintenance is costly, and domestic publics may oppose enduring the costs, economic or otherwise. Three factors constrain states' technological advantages: external challenges from rivals competing for technological superiority, and internal threats stemming from political polarization and long-term demographic change. I test these factors' importance using a novel Taiwan-based survey experiment, exploring public attitudes amidst global semiconductor competition. Adversarial competition induces publics to give up personal economic opportunity to promote national security, with exposure to a PRC semiconductor manufacturing resulting in a predicted 7 percent increase in willingness to accept cost of living increases to impose export controls. However, willingness to pay faces internal threats: KMT voters are on average 27 percent less likely to be willing to endure cost of living increases compared to their DPP voter counterparts, and respondents aged 20-29 are 11 percent less likely to be willing to accept cost of living increases than respondents aged 70+. This paper provides critical microfoundations for weaponized interdependence, illustrating that while publics may rally around critical technology advantages when faced with a geopolitical strategic threat, party politics and demographic change threaten to erode the advantages derived from controlling critical technologies.

The Rally-Around-the-Chips Effect: How Public Opinion Makes or Breaks Emerging Technology Chokepoints[1]

"Taiwan has already mastered advanced semiconductor manufacturing, and we stand at the center of the AI revolution. We are a key player in supply chains for global democracies. For these reasons, Taiwan has an influence on global economic development, as well as humanity's well-being and prosperity.

My fellow citizens: The future of the Republic of China Taiwan will be decided by its 23 million people. The future we decide is not just the future of our nation, but the future of the world."

–LAI CHING-TE, PRESIDENT OF TAIWAN, MAY 20, 2024

4.1 Introduction

On the 75th anniversary of the introduction of martial law in Taiwan and the 28th anniversary of the inauguration of its first democratically elected president, Lai Ching-te stood in front of the Presidential Office to deliver his first speech as Taiwan's newly elected leader. Soon after finishing the cross-Strait section of his speech, Lai turned his attention to another topic familiar to his Taiwanese listeners — Taiwan's critical role in producing, and the world's dependence on, semiconductors. Lai said, "Taiwan is already on the world's center stage. As we look toward our future, we know that semiconductors will be indispensable. And the AI wave has already swept in. Taiwan has already mastered advanced semiconductor manufacturing, and we stand at the center of the AI revolution" (Lai 2024). The Taiwan Lai portrays to his listeners is at the center of emerging technology production — a hub that the entire world depends on. But the future of this technological hub, Lai points out, is not inevitable — it "will be decided by [Taiwan's] 23 million people. The future we decide is not just the future of our nation, but the future of the world." Lai's speech drives home a critical but under-studied point: the choices

[1] I acknowledge funding from the University of Oxford's Clarendon Fund, Balliol College, Winchester and Cyril Foster Funds, and National Taiwan University Web Service. I am grateful to Mats Ahrenshop, Haydn Belfield, Julia Carver, Michael Cerny, Haitong Du, Todd Hall, Sypros Kosmidis, Lev Nachman, Andrea Ruggeri, Duncan Snidal, Huan-Kai Tseng. and participants at the 2024 Bayreuth Political Economy Conference and University of Oxford DPhil seminar for their advice and feedback on various elements of the paper.

everyday people in Taiwan make have the potential to structure semiconductor competition — and thus the development of AI — worldwide. The strategic advantages which Taiwan derives from maintaining advantages in the production of critical technologies comes at a cost to voters — who may or may not be willing to accept the financial cost.

States have realized that they reap tremendous power from controlling critical emerging technology networks (Farrell and Newman 2019). This has been most prominent in the case of semiconductors (Beaumier and Cartright 2024), where the U.S., PRC, EU, Japan, South Korea, and Taiwan have poured billions of dollars into their semiconductor industries to pursue chips self-sufficiency to avoid the vulnerabilities of technological dependence. So far, weaponized interdependence and its descendants has only been evaluated structurally, with the domestic foundations of the theory thus far neglected.

This is a critical omission. Maintaining critical technologies requires substantial economic investment and sacrifice. It is not inevitable that publics will be willing to bear the individual economic costs required to maintain collective strategic advantages, threatening to undermine states' strategic chokepoints and the networked power they derive from it. Weaponized interdependence has domestic foundations — the key question that remains is what they are. More specifically, this paper asks, what costs are publics willing to accept to maintain dominance in industries that bolster their geopolitical security?

I argue that publics know technological chokepoints are important for their own security. Individuals have a choice on whether to invest in the chokepoint and accept financial costs, and a range of external and internal threats threaten to undermine individual resolve. Externally, rival countries can engage in *arms racing* to produce superior technology, sometimes with substantially greater financial resources and population sizes. The prospect of losing technology to a rival could weaken domestic resolve. Internally, support for emerging technology chokepoint maintenance faces two threats. First, support for investing in emerging technology capabilities can face *partisanship*, resulting in partisan divides and coalition politics. Supporters of some parties may be less willing to accept higher costs to maintain strategic technological advantages, threatening to erode existing technological advantages. Second, in the long-term, willingness to endure costs to maintain technological advantages may increase or decrease based on *age-based demographic change*, specifically when willingness to bear economic costs is connected to historically contingent lived experiences. Young people may hold stronger or weaker attachments to certain ideas or experiences, which could become stronger and replace dominant perspectives from older generations, thereby affecting their willingness to accept higher costs to maintain strategic advantages.

To test whether and how these factors might threaten public support for maintaining chokepoints, I conducted a novel survey experiment in Taiwan in May and June 2024 (*n = 2,501).* Respondents were primed with varied information about the state of global semiconductor competition, with treated groups receiving additional information about US and PRC efforts to catch up to Taiwan in the production of high-end logic chips. Respondents were then asked about their willingness to make trade-offs to maintain Taiwan's semiconductor industry, measured most directly through an increase in the cost of living after imposing export controls. The effect of tech competition is tested causally through a survey experiment, while internal effects are preliminarily explored through correlation analysis. The survey was designed following a year living in Taipei from September 2022 to August 2023, during which I conducted approximately 20 informal interviews with groups of academics, think tankers, diplomats, journalists, NGO personnel, government officials, political staffers, and candidates running for elected office, and many more conversations with everyday people living across Taiwan. These conversations allowed for a deeper understanding of the most salient trade-offs individuals were facing at the intersection of geopolitics and their personal lives.

The results suggest Taiwanese respondents are currently willing to endure higher cost of living increases when challenged in the chips industry by the PRC but not when challenged by the U.S. Exposure to semiconductor manufacturing competition results in an on average 7 percent increase in the likelihood a respondent is willing to accept a 10 percent cost of living increase to impose technology-preserving export controls, suggesting that adversarial competition drives willingness to make pocketbook sacrifices to preserve strategic advantages. Moreover, supporters of the incumbent Democratic Progressive Party (DPP) are more sensitive to tech competition from adversaries than supporters of opposition parties. Introducing tech competition increases DPP voters' willingness to endure costs to maintain strategic technological advantages, while KMT and TPP voters' preferences are not impacted by the treatment.

In addition to these treatment effects, exploratory analysis also reveals a clear fracture in resolve to maintain chokepoints along both partisan and age lines. DPP voters are more willing to endure high cost of living increases than both opposition parties, Nationalist Party (KMT) and Taiwan People's Party (TPP) voters, which may reveal party-based fault lines in willingness to pay for strategic technologies; KMT voters are on average 27 percent less likely to accept cost-of-living increases compared to their DPP-voting counterparts. Moreover, younger voters (age 20-29) are on average 11 percent less likely to be willing to endure cost-of-living increases compared to older respondents (70+), reflecting the possible of generational change in willingness to make economic sacrifices for strategic technologies. These internal divisions create the possibility of elite-level polarization of critical strategic industries as well as

forebode the possibility of changing levels of domestic support over time, threatening the ability of states to provide sufficient support to strategic industries in the long-run.

This paper makes important theoretical, empirical, and policy contributions. Technological chokepoints do not exist in a structural vacuum; they require the political and economic support of domestic constituencies. While individual willingness to accept higher economic costs in the face of tech competition from adversary underscores the potential domestic robustness of the emerging technology advantage, internal factors threaten to undermine these strategic advantages. Specifically, technological advantages are threatened by polarization and strengthened by a younger generation that is less willing to bear the cost to maintain advantages in strategic technologies than older ones. While national purses may expand at the whims of external threats, internal dynamics may ultimately undermine them.

Empirically, my spring 2024 survey captures public opinion in Taiwan on semiconductor dependence and prospects for great power war at a critical juncture in U.S.-PRC-Taiwan trilateral relations, semiconductor policy, and global export controls. My data on willingness to accept increased economic burden for national security was collected just a month before U.S. Republican leadership, including former President Donald Trump (Tang 2024) and Former Deputy Assistant Secretary of Defense Elbridge Colby, called on Taiwan to pay more for its defense (Colby 2024). The data accumulated as part of the survey is ripe for use in future studies and prompts important questions on both global supply chains and has implications for great power war.

This paper has important implications for policy in both Taiwan and in the U.S. Specifically, a growing debate in U.S. foreign policy explores whether Taiwan is paying enough for its defense (e.g. Sacks 2024). Willingness to expend resources on critical semiconductor strategic advantages is a critical extension of that debate, as well as exploring various contours that shape Taiwanese willingness to pay for strategic advantages more generally. My results suggest that Taiwanese people are generally threat-sensitive and willing to pay to preserve their autonomy. However, different leaders, facing different mandates from their voters, likely vary in their willingness to impose economically costly but strategically important measures to preserve Taiwan's autonomy. The U.S. should therefore see Taiwan and its public as willing to bear costs when a threat is identified. However, leaders and publics in both the U.S. and Taiwan may differ substantially in terms of current perceptions of the threat the PRC poses.

The rest of the paper is structured as follows. I first advance the idea that power from dependence has important domestic foundations specifically connected to public opinion, providing publics with

challenging economic and personal trade-offs. I then theorize on the sources of variation for these preferences, outline the survey methodology, present my results, and conclude.

4.2 Power from Dependence and Its Domestic Foundations

IR scholars have long theorized that states derive power from other states' dependence on them (Drezner, Farrell, and Newman 2021; Farrell and Newman 2019, 2023; Keohane and Nye 1987, 2001; Stiglitz 2002). This power has been conceptualized in various ways. Keohane and Nye (1987, 2001) pioneered the idea that states derive power from interdependence, understand this power in terms of the costliness of dependence shocks. Power from interdependence, they argue, is defined by *sensitivity*, how changes in one country affect another country in the short-term, and *vulnerability*, the ability of affected states to respond to those in the long-term (Keohane and Nye 2001). Farrell and Newman (2019) challenge the utility of the sensitivity and vulnerability framework, arguing that it applies principally to bilateral relationships, introducing the concept of weaponized interdependence. In the world of weaponized interdependence, hub states control networks on which the rest of the world depend. This networked control, they argue, provides states with two key advantages. First, state controlling networks can collect large amounts of data, which they call the *panopticon effect*. Second, because the nature of dependence in these hubs is asymmetric, hub states have the ability to cut off access to states they hope to coerce, creating *chokepoints*.

In the time since Farrell and Newman first developed weaponized interdependence, IR has witnessed a renaissance of theories that have sought to refine and challenge their foundational work. Subsequent scholars have argued that weaponized interdependence often takes places within the construction of critical infrastructures, a form of infrastructural politics (De Goede and Westermeier 2022), variation in the relationship between states and the private sector in key industries shapes the degree to which states can leverage chokepoints (Gjesvik 2023) and controlling a greater number of networks enhances state power (Beaumier and Cartwright 2024). In addition to challenging the sources of power from dependence, theories have also pointed to the limits of power states derive from interdependence, such as through development of alternative partnerships and networks (Rodrigues Vieira 2023). Finally, scholars seek to explore policy toolkits to prevent adversarial states from using networks as vehicles of coercion (e.g. Ruggi 2023), such as through "collective resilience" (Cha 2023).

These variations of weaponized interdependence theory are structural, exploring how states develop and counter networks of coercion. But the nitty gritty of the industrial policies used to compete to develop these critical technologies are domestic and have public opinion foundations. Consider the army of states

racing to develop semiconductor self-sufficiency: the United States' passed the $52.7 billion CHIPS and Science Act in 2022 (White House 2022), the EU passed its European Chips Act in 2023, South Korea expanded its K-Chips Act in 2023 (Chorzempa 2023), and Japan has expanded its semiconductor industry support (Nohara 2024). The PRC's Made in China 2025 initiative pre-dates the subsequent Chips Acts, reflecting its status as a first mover pursuing self-sufficiency in the semiconductor industry. These policies — like others in the national security sphere — are subject to domestic pressures; elected leaders are constrained by both their voters' preferences and national security prerogatives (Payne 2023). Weaponized interdependence thus requires states to play two-level games and respond to both international and domestic demands (Putnam 1988), the latter of which often requires public support — or at least public acceptance. Power from weaponized interdependence is subject to domestic constraints, raising the critical question of whether states constrained by domestic constituencies can exercise their capabilities to their full potential (Hoffmann 1978; Trubowitz and Harris 2019).

Public opinion matters because elected policymakers are bound to their constituents through selection and responsiveness (Tomz, Weeks, and Yarhi-Milo 2020), and extant literature has begun to investigate how publics understand issues at the intersection of political economy and security studies, as well as the use and responses to coercive measures. Publics prefer trading with allies over adversaries, in part because of concerns that trade will boost the adversary's military capabilities (Carnegie and Gaikwad 2022) or signal lack of commitment to allies (Chen 2024), though these effects are based on states' construction of trade with adversaries as threatening (Beesley and Oak 2024). Meanwhile, the preference for trade with allies may be due to the belief that democratic states are more reliable and consistent partners (Chen, Pevehouse, and Powers 2023). Yet emerging technologies — as a critical case for the intersection among international political economy, international security, and public opinion — are largely absent from extant literature. In the important case of dual-case technologies, publics engage in friendshoring logics, following pocketbook logics in trade with allies and securitization logics in trade with adversaries (Singer 2024). However, extant research has neglected public opinion on attitudes toward the production of emerging technologies. The U.S. public — both Democrats and Republicans – – supports reshoring semiconductors except in the case of severe price increases (Clark, Kreps, and Rao 2024).[2] But we know little about the degree to which other publics are willing to support industrial policies nor how international competition changes this degree of support, especially in cases where industrial policy is a publicly salient national security concern.

[2] Though this could change following the 2024 U.S. presidential election.

In the longer term, public attitudes toward maintaining technological chokepoints are intimately tied to willingness to use coercive measures as an exercise of state power. While extant literature has mostly explored this question in the context of public support for levying sanctions (e.g. Kim and Kim 2024; McLean and Roblyer 2017; Onderco 2017; Pospieszna, Onderco, and van der Veer 2024), the ability to leverage other forms of coercion, such as attitudes toward leveraging chokepoints to impose export controls, remains understudied in the literature. And while we know that publics can spur security dilemma dynamics (Kertzer, Brutger, and Quek 2024), which are often connected to arms racing, we do not yet know how publics respond to efforts by others to arms race.

4.3 How Individuals Weigh the Costs of Maintaining Chokepoints

Despite their clear strategic importance, states will not inevitably maintain their strategic advantages in critical technologies. This is in part because collective strategic benefits reaped from cultivating advantages in strategic technologies have individual-level foundations: individuals face a financial trade-off when it comes to chokepoint maintenance. Industrial policies are expensive, costing governments millions and sometimes even billions of dollars. So too are the economic losses endured through policies like export controls, which are designed to protect strategic technological advantages but at the cost of individual economic benefit. These national security policies therefore induce individual-level pocketbook trade-offs, which in aggregate can shape national security policy.

These trade-offs are not limited to cost-of-living increases; for example, for those with substantial disposable income, these pocketbook tradeoffs do not even require collective action; the choice to invest in a stock in a strategically critical industry, for example, does not require others to do the same to make substantial impact on the industry's comparative advantage. For high-skilled workers in critical industries, the choice of where to live can bear substantially on which states end up developing strategically critical technologies, introducing not just financial trade-offs — the focus of this article — but other personal trade-offs. All these individual-level decisions may shape the trajectories of states, both by influencing policymaker decisions, and in some cases, through individual-level choices that end up structuring technological competition.

Individuals face challenging trade-offs when it comes to their willingness to foot the bill to maintain strategically critical technology advantages; the very presence of trade-offs suggests that government-level support could be subjected to both external and internal threats. Externally, willingness to maintain chokepoints could be enhanced or diminished by other countries competing to gain technological superiority (*tech competition*). Those seeking to protect power connected to their states' chokepoints face

challenges from other states; however, variation in the challenger's security relationship to the challenged country — friendly or hostile — could shape the degree to which they feel threatened by the challenge.

Internally, two factors threaten the ability of governments to maintain chokepoints. First, *partisanship* creates the possibility that support for checkpoint maintenance varies based on the leaders in charge. Parties may vary substantially in the degree to which they platform on emerging technology policy with economic consequence. In many countries, such as the United States over the last decade, issue areas like emerging technology industrial policy and China policy enjoy strong bipartisan consensus, as Clark, Kreps, and Rao (2024) find in the case of semiconductor onshoring. However, in other policy contexts, industrial policy and foreign policy may cut across partisan contexts. For example, in Taiwan, willingness to pay to maintain chokepoints may vary substantially between supporters for the Nationalist Party (KMT), which possesses strong cultural and historical ties to Chinese history and culture, and the Democratic People's Party (DPP), which has positioned Taiwan as a historically independent entity from the PRC. The DPP's emphasis on protecting and promoting a distinctive Taiwanese culture and way of life considering threats from the PRC suggests they may be relatively more willing to endure higher financial and personal costs to maintain their chokepoints.

Second, *age-based demographic change* could shape the public's willingness to pay to maintain strategic advantages over decades. While willingness to pay may follow general age-specific patterns (e.g. younger people are less willing to pay than older people), if demographic change reflects different contextually specific lived experiences. To illustrate the second principle: if young people — especially those born in Taiwan's democratic era following — are relatively more or less willing to immigrate, this would likely reflect potential long-term changes preferences, with the young people of today establishing a longer-term preference trend.

If these three factors — tech competition, partisanship, or age-based demographic change — shapes preferences in aggregate, they have the potential to shape the trajectory of emerging technology advantages. Combining the previously outlined trade-offs with these factors motivates a series of hypotheses.

From a financial perspective, the amounts individuals are willing to pay to maintain technological advantages could differ based on whether the competitor is an ally or adversary — individuals may feel more threatened by adversary technology buildup than ally efforts, motivating Hypothesis 1:

- **H1: Rally-Around-the-Technology Hypothesis:** Individuals exposed to competition for strategic technology from an adversary will be willing to pay more than those unprimed.

Alternatively, because allies might be critical for defense — especially in a case like Taiwan — efforts to develop emerging technology could be seen as threatening dependence reduction measures. This dependence logic is reflected in the following alternative hypothesis:

- **H1A: Costly Dependence Hypothesis**: Individuals exposed to competition for a strategic technology from an ally will be willing to pay more than those unprimed.

In addition to reflecting divides based on tech competition competitor, support for investing in critical technologies could fall clearly along partisan lines. The specific party division will be context specific. In general, however, individuals that support parties emphasizing political autonomy are likely to be willing to pay more to maintain autonomy-protecting technological advantages compared to individuals that support alternative parties. In the Taiwan case, where the DPP platform is distinctively more pro-autonomy than the opposition KMT and TPP, this hypothesis translates as follow:

- **H2: Paying for Autonomy Hypothesis:** Individuals who voted for autonomy-focused parties will be willing to pay more to maintain strategic technological advantages than alternative parties.

Finally, willingness to pay for technological advantages could fall clearly across age-driven demographic divides. Older people may feel more strongly connected to a country's cause and thus be more willing to pay for strategic advantages that sustain it compared to a younger, more globally minded population, motivating the following hypothesis:

- **H3: Old Guard Commitment Hypothesis:** Older individuals will be willing to pay more to maintain strategic technological advantages than younger ones.

Alternatively, younger voters may feel a distinctively strong sense of connection to their current way of life — perhaps much stronger than previous generations. In the Taiwan context, for example, those who were born after Taiwan's democratic transition may feel a uniquely strong sense of loyalty to preserving Taiwan's status quo compared to older generations. This possibility is reflected in the following alternative hypothesis:

- **3A: Youth Movement Hypothesis:** Younger individuals will be willing to pay more to maintain strategic technological advantages than older ones.

Finally, the previously outlined factors may be interactive — sensitivity toward tech competition may be stronger among some demographics than others. This is especially likely to be true for party-based heterogeneous treatment effects, wherein the strength of treatment effects might be conditioned by party-based factors. In particular, the DPP, as the party traditionally most skeptical of the PRC, may be more sensitive to PRC-based tech competition compared to other parties.

- **4: Party-Based Sensitivity Hypothesis:** Supporters of pro-autonomy parties will be willing to pay more to maintain strategic technological advantages when primed with a challenge from an adversary than those from alterative parties.

4.3.1 External Validity Considerations

The effects described above are likely to apply across a wide range of countries and contexts; however, they are likely to be strongest when the domestic regime type is democratic, the number of strategically produced technologies is small (but greater than zero), and the geopolitical consequences of losing the strategic advantage are high. In the regime type case, domestic constraints tend to be stronger in democracies; however, willingness-to-pay hesitations can also affect authoritarian states concerned with regime survival. When the number of strategic technologies produced is small, citizens will be more likely to be concerned with preserving advantages — American respondents, for example, would probably less concerned than Taiwanese about losing advantages in semiconductors because the U.S. possesses other critical technological advantages. Moreover, the immediate geopolitical consequences for a Taiwanese respondent would be greater than for an American — the connection between U.S. security and U.S.-produced semiconductors is less strong than the connection between Taiwan security and Taiwan-produced semiconductors. Even in the U.S. case, however, it is plausible that respondents would be willing to accept substantial price increases to protect technological advantages, especially in the most strategically critical and economically impactful industries, such as those connected to frontier AI.

The Taiwan case represents a distinctively unique confluence of factors: the technology is concentrated in essentially one critical firm (TSMC), the geopolitical stakes are existentially high, and citizens understand the connection between technology and geopolitics quite clearly. In this sense, Taiwan is an extreme case — one in which we might expect willingness to pay to be high and the stakes of partisan divides to be existential, as scholars have recently argued (Nachman and Yen 2025). Those factors make

this case especially useful for theory-building: variation in public preferences and limits to willingness-to-pay in this context would suggest meaningful constraints and the possibility of division in other cases where technology and geopolitics are closely connected.

4.4 Semiconductors and Taiwan's Role in the Semiconductor Supply Chain

Semiconductors are both a representative and most important case for weaponized interdependence, with an expansive supply chain crossing many countries and concentrated within firms holding near-monopolies on different parts of the production process (Khan, Peterson, and Mann 2021). All countries need semiconductors — they are present in nearly all electronic devices, ranging from consumer goods like cell phones, compute to support expanding uses of artificial intelligence like large language models, and military technologies like radars and drones, with chips from the Taiwan-based firm TSMC powering the most cutting edge of these technologies. The power Taiwan derives from semiconductors comes from global demand and TSMC's near monopolistic supply of the fabrication of the most sophisticated logic chips, resulting in a global chokepoint centered in Taiwan (Hunt 2022). In short, other countries' dependence on Taiwan's semiconductors — and the costliness of the prospect of losing access to the global chip supply — gives Taiwan power. As Farrell and Newman (2023) write of TSMC's global stature, "it had become a global economic choke point that great powers wanted to use and deny to others." It is this power from global economic dependence, and the perceived conventional security that comes with it, that forms the foundation of Taiwan's so-called "silicon shield."

The benefits and harms of Taiwan sharing this technology has been considered by Taiwan studies scholars long before they appeared on most US and PRC policymakers' radars (Rigger 2011). But as the U.S. and PRC have come to understand the global importance and significance of semiconductors, TSMC and the future of advanced chipmaking has become a critical nexus of great power competition.

Semiconductors are a critical case for weaponized interdependence not simply because of the prospect that states could hypothetically weaponize interdependence, but because the United States and its allies and partners have already exploited China's reliance on US-controlled semiconductor networks to choke — and optimistically stall — China's semiconductor development. The so-called "October 7" export controls enacted in 2022 (Allen 2023), subsequent multilateral measures by Japan and the Netherlands, and an expanded version of export control rolled out in October 2023 (Dohmen and Feldgoise 2023). U.S. National Security Advisor Jake Sullivan explicitly referenced the logic of leveraging chokepoints in his speech five days after the October 7 controls, stating, "Chokepoints for foundational technologies have to be inside that yard, and the fence has to be high—because our strategic competitors should not

be able to exploit American and allied technologies to undermine American and allied security" (Sullivan 2022). As such, export controls are critical to both understanding the empirical case of semiconductors and the theoretical trade-off between personal economic costs and national strategic benefits induced by them.

Taiwan's critical role in geopolitics and geoeconomics is not simply a structural phenomenon understood by policymakers, it is an understanding also held by most members of the public. While foreign policy issues are often distant from the public, issues around emerging technologies and interdependence are among the most publicly salient. This is particularly true of places like Taiwan, where geopolitical tensions, and particularly cross-Strait issues, have always been (Wu 1999) and have continued to be (Templeman 2020; Xie et al. 2018) among the most salient issues, with key implications for emerging technology policy. The importance of public opinion in Taiwan has been increasingly reflected in literature seeking to understand Taiwanese public opinion as it relates to geopolitics and long-term threats (e.g. Chong, Huang, and Wu 2023; Wang et al. 2023; Wang and Eldemerdash 2023; Wu 2023).

Within the broader structure of U.S.-China tech competition, these theoretical insights have important empirical implications. Awareness of Taiwan's centrality in global economic supply chains, and its role as a key chokepoint, along with growing rhetoric around U.S.-China strategic competition (Winkler 2023) has resulted in the proliferation of discourses on de-coupling and de-risking across North America, Europe, and Asia (Demarais 2023). Particular attention has been paid to interdependence in the semiconductor industry, especially within government and think tank communities (e.g. Khan, Peterson, and Mann 2021; Miller 2022; Thadani and Allen 2023; Thomas 2022), resulting in the semiconductor industry acting as one of the most important sources of U.S.-China competition and determinants of Taiwan's future.

4.5 Methodology

To understand how publics weigh trade-offs in maintaining advantages in emerging technology, I conducted a survey experiment of 2,501 participants living in Taiwan, the full version for which is available in Appendix B. After completing a series of demographic questions, respondents were exposed to a vignette regarding the importance of Taiwan's semiconductor industry. They then received varied information about challenges to Taiwan's semiconductor advantage. The control group received no additional information, while treatment groups were primed with information about either U.S. or PRC efforts to onshore semiconductor manufacturing which could threaten Taiwan's semiconductor chokepoint. Respondents were then asked a series of follow-up questions, including those measuring

their willingness to pay to protect their country's strategic advantage in the chips industry. The experimental design allowed for causally testing whether variation in technological competition shapes preferences. In addition, exploring relationships between pre-treatment demographic and preference variables, meanwhile, allowed for the establishment of relationships between individual and domestic characteristics and outcomes of interest, such as party affiliation and age, along with useful correlations.

Survey Provision

The survey was administered by National Taiwan University (NTU)'s Web Service, a Taiwan-based survey provider, between May 31 and June 20, 2024, via Qualtrics. The dates were chosen to avoid potentially confounding events such as the 2024 election, the inauguration of President Lai Qing-te, and PRC military drills that followed the election. Working with NTU provided several distinct advantages. First, NTU is one of the most prestigious higher education institutions in Taiwan, providing important legitimacy to the provision of the survey. Second, NTU conducts surveys using weighted sampling, with sampling weights to ensure demographically representative populations can participate. Weighted sampling was performed to ensure balance with respect to administrative districts, gender, and age, creating 72 block quotas. Third, NTU provided useful editing assistance of the questions to ensure they were standard for survey questionnaires administered in Taiwan.

Over 43,000 people are currently registered members of the Panel. NTUWS's sample is appropriate for surveys of fewer than 5,000 respondents, well within range for the survey's sample size of 2,500. Each respondent was compensated 50 NTD for participation in the survey experiment. Subjects were recruited via a mixed-mode method that utilizes primarily online opt-in. NTUWS augmented this with periodic random digit dialing (RDD) and face-to-face invitation-to-join within a smaller Primary Sampling Unit (PSU) that uses GIS sampling. Subjects were compensated with an e-coupon of 50 NTD 50 (approx. £1.21) after completing the survey.

Primary Outcome Variable: Cost-of-Living Trade-Offs

The primary outcome of concern is whether individuals would be willing to accept personal economic costs to support policies that would clearly support national advantages in strategically critical emerging technologies. To measure variation in these attitudes, respondents were asked whether they would support restricting semiconductor exports if it meant a 10% increase in the cost of living. Export controls, as a highly plausible cost of increases in the cost of living, represented a useful and practical way of constructing the trade-off. Certain products from Taiwan, such as pineapples and petrochemicals,

have been subject to coercive economic measures by the PRC, rendering cost of living impacts tangible to Taiwanese respondents (Hale 2024).

Respondents indicated whether they strongly supported, probably supported, probably opposed, or strongly opposed, which for ease of interpretation was aggregated into a simple support/oppose trade-off in the main analysis and explored disaggregated in supplemental analysis. Although respondents may not be able to literally conceptualize a 10% increase in the cost of living, this baseline number at least allows for a study of variation to the prompt.

Follow-up questions sought to more specifically quantify the extent to which respondents would accept cost of living increases. Those who supported the measure received a follow-up question asking if they would support the measure if it meant a 15% increase in the cost of living. Respondents who opposed the measure, meanwhile, were asked if they would support the measure if it meant a 5% increase in the cost of living. Taken together, these answers were used to create a variable dividing respondents by willingness to endure cost of living increases of 0-5%, 5-10%, 10-15%, and 15%+. Whether options for support or opposition were shown first was randomized to reduce the probability of response bias.

Alternative Financial Trade-Off Measures

As an alternative measure of preferences toward export control policies, respondents were asked for their support for three different types of semiconductor policies: limiting sales of semiconductor chips to competitors, limiting sales of semiconductor chips globally, and limiting sales of state-of-the-art semiconductor chips to competitors. The question was used to measure whether respondents are sensitive to the economic costs by differentiating the economic costs associated with different degrees of export controls. Respondents indicated their preferences on a 0 to 10 scale, with 0 being definitely oppose and 10 being definitely support. The order of the listing of the three policies was randomized to reduce the probability of acquiescence bias.

Financial sacrifices do not merely exist in the cost-of-living domain. There are also critical trade-offs for investors: individuals may be willing to utilize their disposable income to invest in strategically critical industries. Thus, respondents were asked what percentage of their income they would be willing to invest in TSMC stock at intervals of 0%, 0-5%, 5-10%, 10-15%, and 15%+. This willingness to invest in TSMC was contrasted with willingness to invest in the Evergreen Group, one of Taiwan's largest international firms that controls Evergreen Marine Corporation — the world's third-largest containerized shipping firm — and EVA Air, Taiwan's primary airline. While TSMC and Evergreen vary

along dimensions beyond industry, such as market size, it provides a useful point of comparison to explore individual variation according to both treatment assignment and individual-level characteristics. Differential preferences between investing in TSMC compared to EVA could reflect that respondents were considering the importance of the company to strategically critical sectors, regardless of the stock's economic projection. These investment-based trade-offs, while distinctive from the cost-of-living trade-offs posed by export controls, offer useful supplemental insights into how individuals navigate economic-security trade-offs.

In a similar vein, to contextualize these results and better understand the extent to which willingness to invest in TSMC was driven by expectations of strong economic performance, respondents were asked how well they think TSMC's stock will perform over the next five years, measured according to a scale of very well, pretty well, pretty poorly, or very poorly. Whether options for high or low levels of investment, as well as strong or poor performance, were shown first was randomized to reduce the probability of response bias.

Treatment Variable: The Effect of External Threats

The crux of the survey experiment focuses on technological competition, with variation in the country respondents were primed with as the primary challenger. The challenging country treatment was operationalized as the U.S. and PRC. In addition to having distinctive relationships to Taiwan in term of their status as friends or foes, challenger countries must have sufficient resources to make a plausible challenge to overtaking the current technological hegemon, limiting the universe of cases to those with sufficient economic, technological, and human capital to compete. Empirically, the United States and China, as great powers who have invested significant resources into developing their semiconductor industries, represent optimal operationalizations of the challenging country concept.

These states are also critical cases, as both developed policies that actively seek to reduce dependence on Taiwan. In 2015, China released its "Made in China 2025," a strategy aimed to reduce dependency on critical technologies, with a notable focus on advanced semiconductor manufacturing, and has raised approximately $50 billion through its Integrated Circuit Industry Investment Fund alone (Reuters 2024). In 2022, the United States' CHIPS Act authorized *$280 billion* in its domestic semiconductor industry (Tracy and Andrews 2022). Together, these policies reflect the real role the U.S. and China could play as challengers to Taiwanese supremacy in semiconductor fabrication. While in practice these challenges to Taiwan's semiconductor lead are occurring concurrently, treating respondents with only one country allowed for an isolation of each country's impact. In addition to exploiting primary variation in the

challenger country, the vignettes also differed in the time horizon of the challenge provided with the challenge time horizon either as soon as 2029 (in five years) or 2034 (in 10 years). This variation was designed to ensure the robustness of the results to any one date.

The treatment was introduced through a vignette centered on Taiwan's semiconductor industry. All groups received a basic overview of the critical role semiconductors play in Taiwan's domestic economy and the relationship between Taiwan's leadership in chip manufacturing and its national security. However, treatment groups received supplementary details: a projection from an international expert about a potential threat in either 5 or 10 years. An international expert was used to introduce the treatment as they were likely to be less controversial than a domestic government figure.

The full vignettes are included below:

Control Group Vignette [English]: Taiwan produces 90 percent of the world's most advanced semiconductors. Many people believe that because semiconductors are so important for the global economy, Taiwan's technological advantage in semiconductors helps protect against external threats.

Treatment Group Vignette [English] ***— bold indicates difference from control****:* Taiwan produces 90 percent of the world's most advanced semiconductors. Many people believe that because semiconductors are so important for the global economy, Taiwan's technological advantage in semiconductors helps protect against external threats. **However, countries like [the United States/China] are investing billions of dollars to improve their own semiconductor industries and reduce their dependence on Taiwan. International experts predict that as soon as [2029/2034], [the United States/China] could pass Taiwan in the production of the world's most advanced semiconductors.**

As a robustness check for the dependence deterrence hypothesis, I tested whether respondents are sensitive to ongoing US efforts to onshore semiconductor manufacturing. Therefore, in both United States treatment groups, I added two sub-groups to the United States vignette to state ***— bold indicates difference from primary treatment***: "However, countries like the United States are investing billions of dollars to improve their own semiconductor industries, **bringing foreign manufacturers to the U.S. and** reducing their dependence on Taiwan**.** 250 respondents were added to each of these groups on top of the initial 400 each to carry out this robustness check.

Additional Variables of Interest: Partisanship, Age, and the Effect of Internal Threats

The most important domestic and individual-level variables for my theory are vote selection in Taiwan's January 2024 general election and age. The 2024 vote variable simply asked respondents who they voted for in the January election, with response options including the named candidates Lai Ching-Te (DPP), Hou You-Yi (KMT), Ko Wen-Je (TPP), Didn't Vote, and Prefer Not to Say.[3] The age variable was divided into 10 years intervals (e.g. 20-29), increasing to 70+. Importantly, the 20-29 group was unique as the only age group to have lived exclusively during Taiwan's post-democratization period. Regressions exploring the effects of these variables are exploratory.

Regression Specifications

The main experimental regression, which explores the effect of country treatment assignment on willingness to accept a 10 percent increase in the cost of living, is given by the binomial logit:

$Y_i = \beta_0 + \beta_1 CountryTreatment_i + \boldsymbol{\varepsilon}$, where Y is the yes/no decision to accept a 10 percent increase in the cost of living to impose export controls, *CountryTreatment* reflects random treatment assignment to either the control, US, or China, and $\boldsymbol{\varepsilon}$ is the error term.

Additional, non-experimental bivariate regressions were run to establish whether partisanship and age group explain variation in willingness to accept cost-of-living increases, with these binomial logit regressions given as $Y_i = \beta_0 + \beta_2 Vote2024_i + \boldsymbol{\varepsilon}$, where *Vote2024* is the respondent's stated preferred candidate in Taiwan's 2024 Presidential election, and $Y_i = \beta_0 + \beta_3 Age_i + \boldsymbol{\varepsilon}$, where Age is an ordered variable of age ranges with age 20-29 serving as the reference category.

In addition to these baseline controls, I also ran regressions that include all three main variables above – – *CountryTreatment*, *Vote2024*, and *Age* — as well as a wider set of controls, designed to account for potential omitted variable concerns related to *Vote2024* and *Age*, which I discuss in the next sub-section.

Controls

Control variables were gathered both through questions gathered by the survey provider before the survey as well as through specific questions in the survey. They are included in multivariate versions of the regression to account for the possibility of omitted variable bias in the case that randomization was not carried out correctly, as well as to address potential confounders of the effects of party and age. The

[3] Including a "prefer not to say" option.

first multivariate regression simply treats party and age as controls for country treatment. The second multivariate regression is more expansive, including variables for income,[4] administrative region, ethnicity, education, and marriage status. The distribution of each of these variables is included in Appendix C, and reveals strong balance based on treatment assignment.

To understand respondent pre-held views toward the treatment countries, respondents were asked, "What are your thoughts on the following countries?" In addition to the U.S. and China, respondents were asked about Singapore, Pakistan, and Lithuania, which vary in terms of their geography, frequency of discussion in Taiwanese media, and levels of friendliness toward Taiwan.[5] Variables measuring the ranking of the U.S. and China within this list for each respondent were also included as controls.

Assumptions About Understanding of News and Global Affairs

For public opinion to matter with respect to foreign policy, the public must be relatively well-read on public opinion issues. To assess familiarity with current events, respondents were asked: how often do you read about education, sports, and pop culture, in addition to international relations and technology, to avoid priming them to questions regarding semiconductor competition specifically. Higher reported frequency of reading news on international relations or technology compared to the other three categories would demonstrate the relatively high salience of these issues for the average Taiwan reader. In addition, if the public is truly sensitive to the treatment, it should be able to link the treatment to broader geopolitical considerations. As such, respondents were asked to rank the factors they believed were most likely to influence a PRC invasion of Taiwan: dependence on semiconductors, the strategic importance of the First Island Chain, PRC domestic turmoil, PRC history and ideology, or Xi's ambition. They were also asked to rank the factors they believed were most likely to influence whether the U.S. would defend Taiwan: dependence on semiconductors, the strategic importance of the First Island Chain, Taiwan's status as a democracy, the role of Taiwanese people in the U.S., or U.S. status in Asia. While answers to these questions could reasonably vary, respondents should be able to differentiate the likely importance of global semiconductor dependence for US defense and deterrence (very important) compared to the motivation for a potential Chinese invasion (not important).

Robustness Checks and Threats to Inference

[4] Four income level brackets were created based on the Director General of Budget, Accounting, and Statistics (DGBAS)'s report on estimated monthly income, ensuring a relatively uniform distribution across respondents.
[5] Respondents rank the countries from 1 (most positive) to 5 (most negative).

Several measures were taken to ensure the robustness of results both prior to the survey's launch and after getting the results. I separated these robustness checks according to the source of threat: power, selection bias and balance, construct validity, attention and recall, regression specification and sensitivity, and question comprehension.

Power: Before running the survey, a power analysis leveraging ANOVA testing was conducted to achieve standard statistical power $\beta = .80$ and protect against Type II Errors, when a true effect is mislabelled as false. The sample size for the primary analysis — 2,160 respondents were divided into five groups — reflected NTUWS' best practice of including at least 400 respondents per treatment group.

Selection Bias and Balance: To protect against potential selection bias issues stemming from lack of balance, I ran chi-squared balance checks to ensure key demographic co-variates — age, gender, education level, marriage status, and income — do not predict assignment to 1) country and 2) treatment, referring to the interaction of country and time horizon:, to ensure random assignment to treatment and control was done correctly, in addition to relying on stratified sampling. Moreover, to reduce the potential effects of priming, the order of response options for each question was randomized or randomly reversed where appropriate, full details for which are described in the appendix. Similarly, the order of questions within certain blocks of questions was randomized to account for question priming effects. These randomization specifications are detailed in the full survey in Appendix A.

Construct Validity: The vignettes for the treatment groups did not specifically mention TSMC's efforts to build fabs abroad in Japan and, most critically for this study, the United States. As such, I created two additional smaller treatment groups within the U.S. treatments (5-year and 10-year time horizons, respectively) that mention ongoing US efforts to onshore semiconductor manufacturing capabilities from Taiwan to test whether mentioning these concrete efforts changes results. Finally, I tested whether respondents found the treatment believable by asking whether they found the international expert's analysis to be believable.

Attention and Recall: Given the length of the survey, one worry is that respondents experienced survey fatigue or clicked past important information, such as the vignette. To address this concern, two attention checks were introduced: one asking respondents to identify which firm is in the semiconductor industry out of a lineup of Taiwanese firms, and to identify the CEO and president of TSMC out of a group of famous people Taiwanese people. Respondents were required to read the vignette for a minimum of three seconds. Finally, at the end of the survey, respondents in treatment groups were asked

to recall the country competing for the semiconductors and the time horizon during which they might surpass Taiwan's capabilities.

Omitted Variable Bias: For the experimental analysis — where *country* is the independent variable of interest — no covariates should be required if randomization was carried out properly. However, to ensure the robustness of the party and age regressions, control variables were added to account for variables that would have influenced both party/age and preferences regarding financial trade-offs.

Regression Specification and Sensitivity: In addition to running the primary binomial logit regression of treatment country on willingness to accept cost-of-living-increases, the regressions were re-specified as two ordered logit regressions. The first looked specifically at degrees of support (strongly oppose/probably oppose/probably support/strongly support). The second included responses to a series of follow-up questions more granularly quantifying respondent willingness to accept cost-of-living-increases.

Question Comprehension: A pilot analysis was conducted in March 2024 to ensure questions were understood as intended. Mandarin-language questions were reviewed by Taiwan-based survey providers to ensure question phrasing was standard for respondent.

4.6 Results

In this section, I present the survey experiment results. When primed with information about Chinese semiconductor manufacturing development efforts, Taiwan respondents demonstrated a willingness to endure cost of living increases to impose strategic export control policies, an effect significant at the 99 percent confidence level. Meanwhile, information about U.S. semiconductor manufacturing did not have a statistically significant effect on Taiwan's public willingness to pay to impose export controls, suggesting that Taiwanese respondents securitized against — and were willing to pay up to combat — tech competition from adversaries but not from allies. However, Taiwan's population was divided in its willingness to pay in two key areas. First, voters of the ruling DPP party were substantially more willing to endure cost of living increases than those who supported the opposition KMT or TPP. Second, older respondents were more willing to tolerate cost of living increases to impose export controls than those in the 20-29 age range.

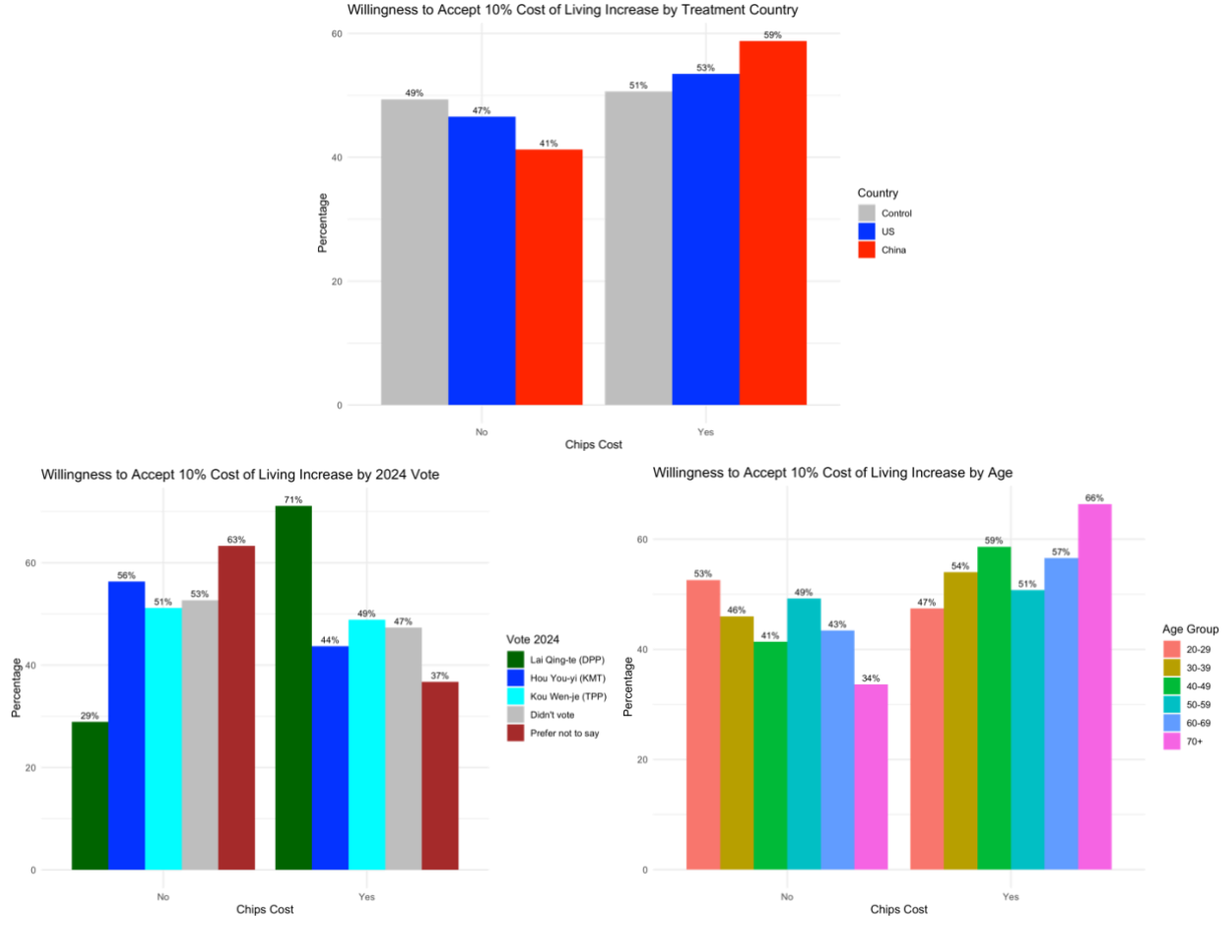
The rest of the sub-section proceeds as follows: it analyzes the key primary results for export control policy support, explores relevant heterogeneous treatment effects to get closer to the mechanism,

considers alternative measures of economic trade-offs, and finally subjects the results to a series of robustness checks.

Cost of Living Increase Trade-Offs

The crux of this paper is to explore the factors explaining variation in individual willingness to bear substantial personal financial costs to protect strategic emerging technology industries. Before moving into regression analysis, I first plot the distribution of responses descriptively based on 1) country assigned at treatment, 2) the party they voted for in the 2024 election, and 3) their age, the results of which are displayed in Figure 4.1.

Figure 4.1: Willingness to Accept 10% Cost of Living Increase to Impose Strategic Export Controls
First Row Displays External Factors; Second Row Displays Internal Factors



Three trends emerge from the descriptive analysis. First, respondents in the control were essentially split 50/50 regarding their willingness to accept a 10 percent increase in their willingness to pay for costly export control policies; however, this number jumps to 59 percent for the group warned of PRC efforts to build semiconductor capabilities, providing preliminary evidence that individuals are willing to pay up

when challenged by an adversary for strategic technologies. Second, supporters of the currently-in-power DPP appear substantially more willing to accept high cost of living increases than those supporting the KMT or TPP, for whom more than half of supporters said they would not be willing to accept the increase in the cost of living to impose export controls. Third, the percentage of respondents stating they were willing to accept cost of living increases almost uniformly increased as respondent age increased, with 66% of respondents aged 70 and above saying they would support the export controls, contrasted with only 47% of respondents aged 20-29, suggesting that willingness to accept cost of living increases may increase with age. These descriptive statistics provide a fruitful starting point for additional regression analysis to establish stronger relationships.

The regression analysis confirms the three trends identified above, beginning with a binary logit analysis displayed in Table 4.1. Regression 1 assesses how variation in external tech competition affects willingness to accept cost of living increases to impose export controls, regression 2 explores the relationship between voting behavior and cost of living increase preferences, and regression 3 looks at variation in age. Regression 4 looks at all three core variables together, while regression 5 introduces further controls, which are not visible in the table to ensure legibility. Information about tech competition from China drove respondents to accept higher increases in cost of living compared to those not primed with tech competition information, an effect significant at the 99 percent confidence level across all three regressions. Respondents primed with information about tech competition with the U.S., in contrast, did not vary substantially in their willingness to pay compared to the control group. These results suggest that competition from adversaries may play a uniquely important role in driving willingness to pay to maintain strategic advantages.

The results also point to substantial variation within Taiwan, however, based on both party preferences and age. KMT and TPP voters, respectively, were less willing to endure cost of living increases compared to DPP voters, effects significant at the 99 percent confidence level across all three regressions. Older respondents, meanwhile, were more willing to accept cost of living increases compared to those between the age of 20-29, with effects significant for all age groups in the multivariate regression. Taken together, the results suggest divisions in willingness to pay across different demographics. A change in party leadership in Taiwan's 2028 election, or long-term change in preferences as the older generation ages, could make implementing policies like export controls more politically challenging.

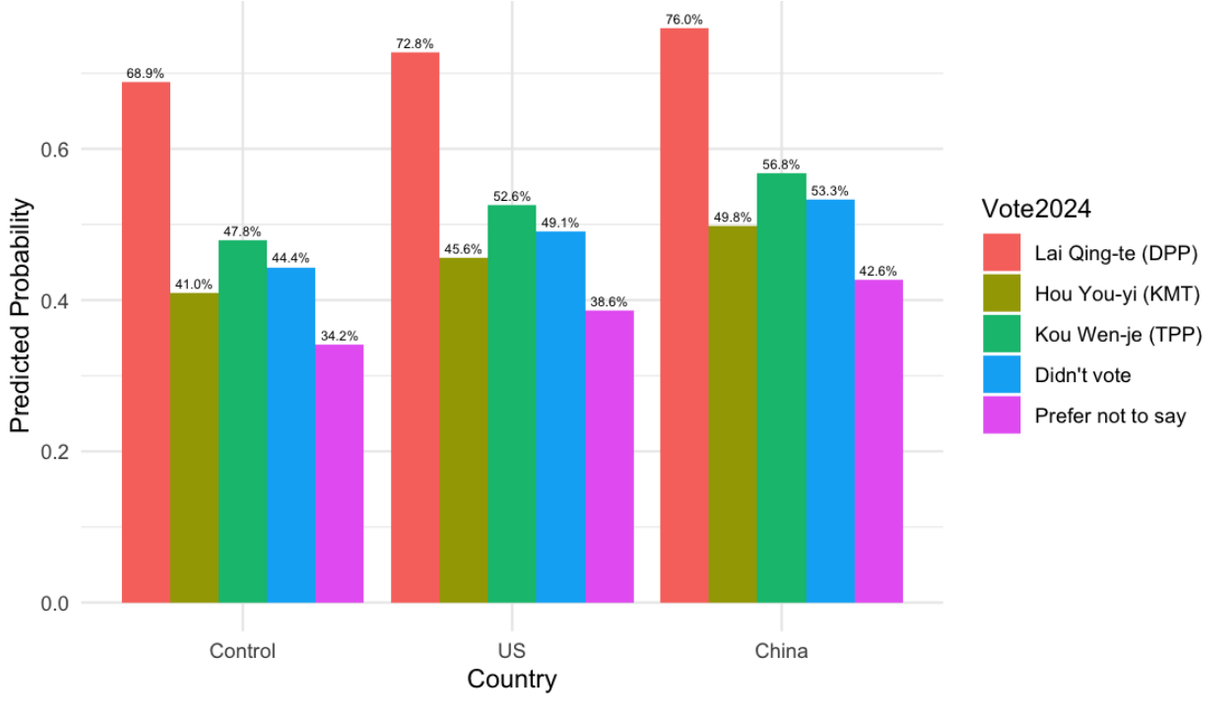
Table 4.1: Factors Shaping Willingness to Accept Price Increases as a Result of Export Controls

	Dependent variable:				
	Accept Cost of Living Increase				
	Country	2024 Vote	Age	Combined	All Controls
	(1)	(2)	(3)	(4)	(5)
countryUS	0.142			0.190	0.152
	(0.124)			(0.128)	(0.136)
countryChina	0.329***			0.359***	0.377***
	(0.124)			(0.129)	(0.137)
vote2024Hou You-yi (KMT)		−1.132***		−1.160***	−0.887***
		(0.129)		(0.132)	(0.148)
vote2024Kou Wen-je (TPP)		−0.925***		−0.881***	−0.743***
		(0.121)		(0.124)	(0.135)
vote2024Didn't vote		−1.027***		−1.021***	−0.794***
		(0.151)		(0.152)	(0.164)
vote2024Prefer not to say		−1.476***		−1.450***	−1.235***
		(0.264)		(0.266)	(0.282)
age30-39			0.256*	0.263	0.354**
			(0.156)	(0.160)	(0.175)
age40-49			0.422***	0.387**	0.492***
			(0.151)	(0.156)	(0.171)
age50-59			0.079	0.129	0.299
			(0.164)	(0.173)	(0.188)
age60-69			0.412**	0.465**	0.676***
			(0.177)	(0.188)	(0.204)
age70+			0.600**	0.496*	0.499*
			(0.246)	(0.260)	(0.276)
Constant	0.025	0.910***	−0.061	0.407**	−1.569**
	(0.101)	(0.084)	(0.124)	(0.173)	(0.678)
Observations	1,969	1,969	1,969	1,969	1,807
Log Likelihood	−1,349.822	−1,294.417	−1,346.292	−1,284.770	−1,150.986
Akaike Inf. Crit.	2,705.644	2,598.833	2,704.584	2,593.540	2,367.972
Note:					*p<0.1; **p<0.05; ***p<0.01

Predicted probabilities offer a more intuitive way of interpreting the results, providing point estimates to estimate the percentage change of treatment effects or variation across key covariates. Figure 4.2 illustrates predicted probabilities based on the combined regression including treatment country assignment, 2024 voting behavior, and age, with age held constant for the 40-49 year age group.

Exposure to PRC semiconductor competition increased willingness to accept increases in the cost of living across all three parties, with a 7.1 percent increase in the probability a respondent would accept a 10 percent increase in the cost of living for DPP supporters, 8.8 percent increase in probability for KMT supporters, and 9 percent increase in probability for TPP supporters. These results all point to respondent sensitivity to technological competition as a driver of willingness to endure costs to protect key industries.

Figure 4.2: Predicted Probabilities by Country and 2024 Voting Behavior



Partisan divides paint a much starker picture, however. While a DPP voter in the control group was willing to accept a 10 percent increase in the cost of living to impose costly export controls a predicted 68.9 percent of the time, only 41 percent of KMT voters would be expected to agree to the same proposition, reflecting a 27.9 percent decrease. Similarly stark differences held between DPP and KMT voters in both treatment groups, with a 27.2 percent difference for those in the U.S. treatment group and 26.2 percent difference for those in the China treatment group. These party-based differences highlight the fragility of public willingness to endure costs to protect key industries and their vulnerability to changing partisan tides.

Finally, older respondents were more likely to say they are willing to endure 10 percent increases in the cost of living compared to younger respondents. DPP, KMT, and TPP respondents aged 70 and above in the control group were all on average greater than 11 percent more likely to be willing to say they are

willing to endure price increases compared to those in the 20-29 age bracket. These findings further underscore the age-based differences in respondent willingness to endure price increases.

Getting to the Mechanism: Party-Based Heterogeneous Treatment Effects

Importantly, willingness to pay in the face of Chinese tech competition was not constant but reflective of party-based variation in sensitivity to both the U.S. and PRC treatment. Table 4.2 shows regressions subsetted on voter support for the three major parties in Taiwan for both bivariate and multivariate regression. Only DPP voters, in both the bivariate and multivariate regressions, were statistically significant predictors of willingness to accept cost of living increases in the face of competition from the PRC. Not only were DPP voters generally more willing to pay up to protect their strategic technology when faced with PRC competition, the opposite might be true when the competitor is the U.S.: the coefficient, though not significant, is negative, highlighting how ally-adversary dynamics condition DPP voter financial preferences. Ko Wen-je's TPP party, while not a statistically significant predictor of willingness to accept cost of living increases when faced with competition from either the U.S. or PRC, adds important color to party-based preferences: his supporters were willing to pay the most in light of semiconductor competition from the United States. This could reflect in part 質美論 (*zhì měi lùn*) — Taiwanese skepticism of the U.S. — that has grown stronger with the TPP faction. Taken together, the findings suggest that party affiliation conditioned the extent to which individuals were sensitive to threats from external competition, particularly from adversarial actors.

Table 4.2: Effect of External Competition on Willingness to Accept Price Increases Resulting from Export Controls (By Party Affiliation)

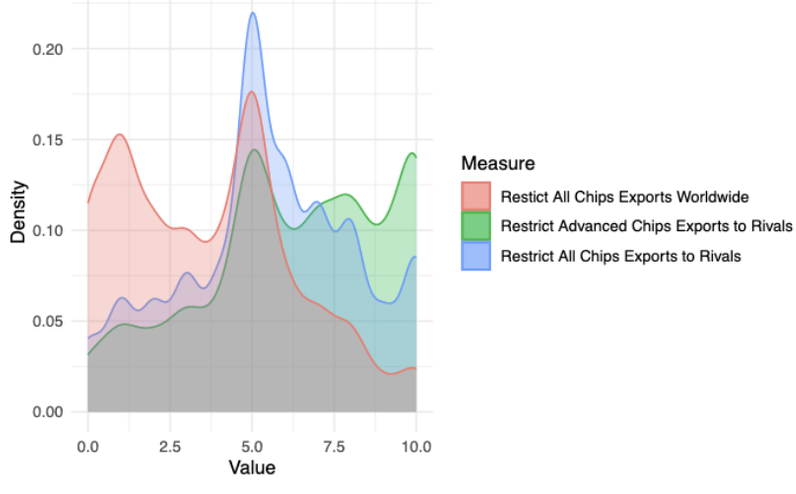
	Dependent variable:					
	Accept Cost of Living Increase					
	DPP (Bi)	KMT (Bi)	TPP (Bi)	DPP (Multi)	KMT (Multi)	TPP (Multiv)
	(1)	(2)	(3)	(4)	(5)	(6)
countryUS	−0.151	0.177	0.238	−0.245	0.109	0.172
	(0.209)	(0.261)	(0.228)	(0.232)	(0.290)	(0.251)
countryChina	0.582**	0.185	0.303	0.570**	0.105	0.278
	(0.232)	(0.277)	(0.239)	(0.257)	(0.313)	(0.262)
Constant	0.786***	−0.405*	−0.266	−3.059**	−2.541**	−1.103
	(0.178)	(0.228)	(0.196)	(1.482)	(1.219)	(1.041)
Observations	789	499	610	731	460	557
Log Likelihood	−465.945	−341.627	−421.827	−408.366	−282.391	−363.107
Akaike Inf. Crit.	937.891	689.254	849.655	884.732	632.782	792.213
Note:						*p<0.1; **p<0.05; ***p<0.01

Beyond Cost-of-Living Increases

Export control measures have two key dimensions worth studying. First, export controls induce increases in the cost of living, as has already been discussed. Second, export controls can vary substantially in their scope, such as whether they block access to all or only the most advanced technology, and to which countries technological access is restricted. Exploring variation in support for various export control policies demonstrates sensitivity to their economic logics: the more extensively export controls are imposed, the higher the economic cost imposed on taxpayers and industry.

In general, Taiwanese respondents were supportive of restrictive export control measures but more wary of larger scale restrictions. Figure 4.3 displays a density plot of support for chip measures, with 0 reflecting "completely oppose" and 10 reflecting "completely support." Taiwanese respondents were generally supportive of restricting exports of advanced chips to rivals, the least aggressive of the export control measures. Restricting all chips to rivals — such as sales of legacy chips to the PRC — split the respondent pool, while respondents generally opposed restricting global chips exports. The results demonstrate that Taiwanese respondents were generally sensitive to the logic of and consequences of export controls.

Figure 4.3: Density Plot of Chip Measures
Most Taiwanese People Support Export Controls on Advanced Chips to Rivals



Investment

Personal investment provides a distinctive economic trade-off from cost-of-living increases: a choice in how individuals allocate their disposable income. In particular, variation in how respondents choose to invest — in strategically critical technology compared to other high-performing, less strategically important sectors — could demonstrate respondent willingness to pay to maintain strategic advantages.

While less directly connected to strategy than a policy like export controls, investment preferences are a useful alternative measure to study preferences. Table 7 demonstrates individuals' stated investments preferences for two high-performing Taiwanese stocks: TSMC and Evergreen. Follow-up questions revealed respondents were uniformly bullish on TSMC, with 87 percent of respondents reporting they thought TSMC would perform relatively well or very well in the next five years. However, to tease out whether respondents think about TSMC investment differently compared to counterfactually similarly stocks, preferences for investing in TSMC were compared to Evergreen. The ordered logit results for this comparison are included in Table 4.3. Regressions 1 and 2 explore the effect of country treatment assignment on willingness to invest, 3 and 4 look at the same relationship but only for those who voted for the DPP in the 2024 election, 5 and 6 consider the bivariate relationship between party support and stock investment, while 7 and 8 look at a multivariate relationship that includes age along with the full set of controls outlined previously.

Table 4.3: Preferences for TSMC and Evergreen Stocks

	Dependent variable:							
	TSMC	Evergreen	TSMC	Evergreen	TSMC	Evergreen	TSMC	Evergreen
	Country Assignment		Lai Subset		2024 Vote		Age	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
countryUS	−0.004	0.018	0.166	0.033				
	(0.109)	(0.111)	(0.185)	(0.188)				
countryChina	0.023	0.040	0.275	−0.035				
	(0.109)	(0.111)	(0.183)	(0.186)				
vote2024Hou You-yi (KMT)					−0.408***	0.006	−0.241*	−0.030
					(0.110)	(0.112)	(0.125)	(0.127)
vote2024Kou Wen-je (TPP)					−0.454***	−0.207**	−0.314***	−0.169
					(0.103)	(0.105)	(0.112)	(0.116)
vote2024Didn't vote					−0.432***	−0.085	−0.407***	−0.113
					(0.127)	(0.130)	(0.137)	(0.140)
vote2024Prefer not to say					−0.484**	−0.149	−0.372	−0.162
					(0.216)	(0.227)	(0.229)	(0.239)
age30-39							−0.323**	−0.138
							(0.147)	(0.150)
age40-49							−0.117	−0.003
							(0.144)	(0.148)
age50-59							−0.130	−0.089
							(0.159)	(0.162)
age60-69							−0.181	−0.001
							(0.169)	(0.174)
age70+							−0.050	−0.137
							(0.230)	(0.231)
Observations	2,092	2,092	722	722	2,092	2,092	1,923	1,923
Note:								*p<0.1; **p<0.05; ***p<0.01

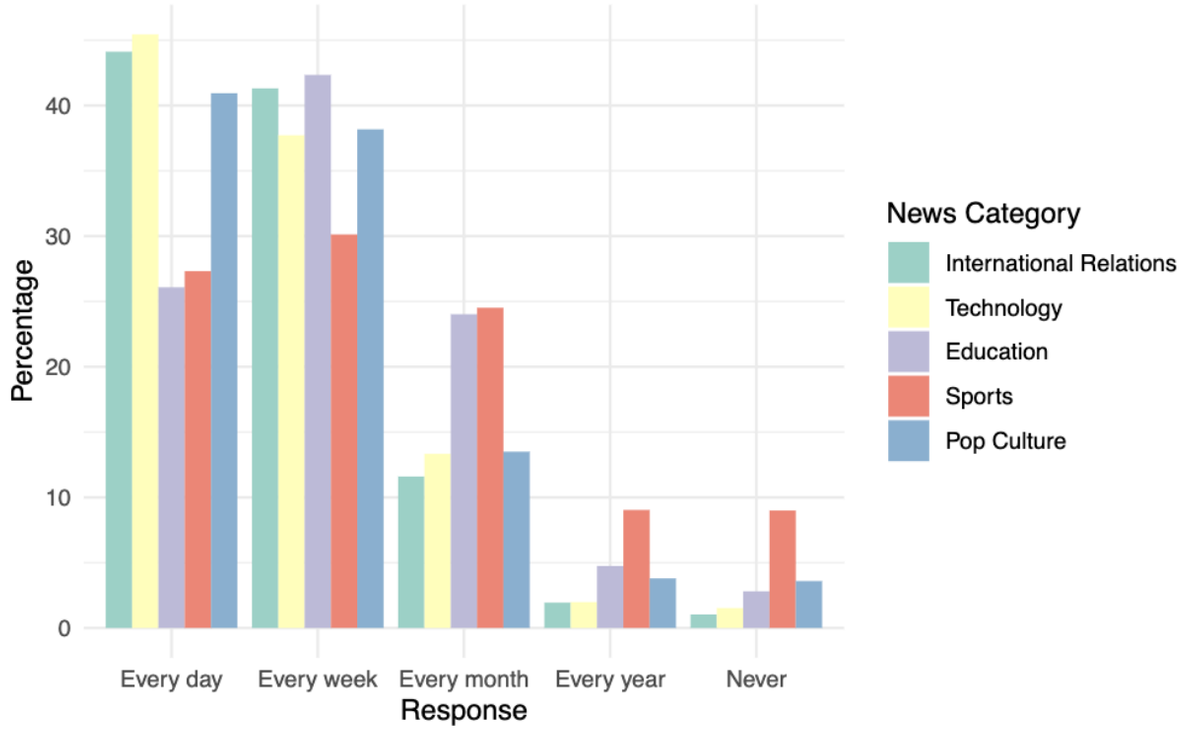
Although respondents primed with information about tech competition from either the U.S. or PRC did not have significantly different invest plans compared to those in the control group, the results do point

to a similar DPP bump for TSMC investment (and not Evergreen) investment when faced with tech competition from the PRC, providing some additional evidence to support the party-based sensitivity hypothesis. In addition, partisanship does appear to structure differences between preferences for investment in TSMC and Evergreen. While both KMT and DPP voters preferred investing in TSMC to Evergreen in absolute terms, DPP voters were relatively more willing to invest in TSMC compared to KMT voters, significant at the 99 percent confidence level in the bivariate regression and 90 percent confidence level in the multivariate regression. Evergreen investment, in contrast, lacked such a partisan division. These findings suggest that while Evergreen investment was largely a personal economic decision, ideological or policy preference concerns may drive TSMC investment for DPP voters in ways that they do not for KMT voters, underscoring that important role partisan divides play in financial support for TSMC.

Assumption Testing and Robustness Checks

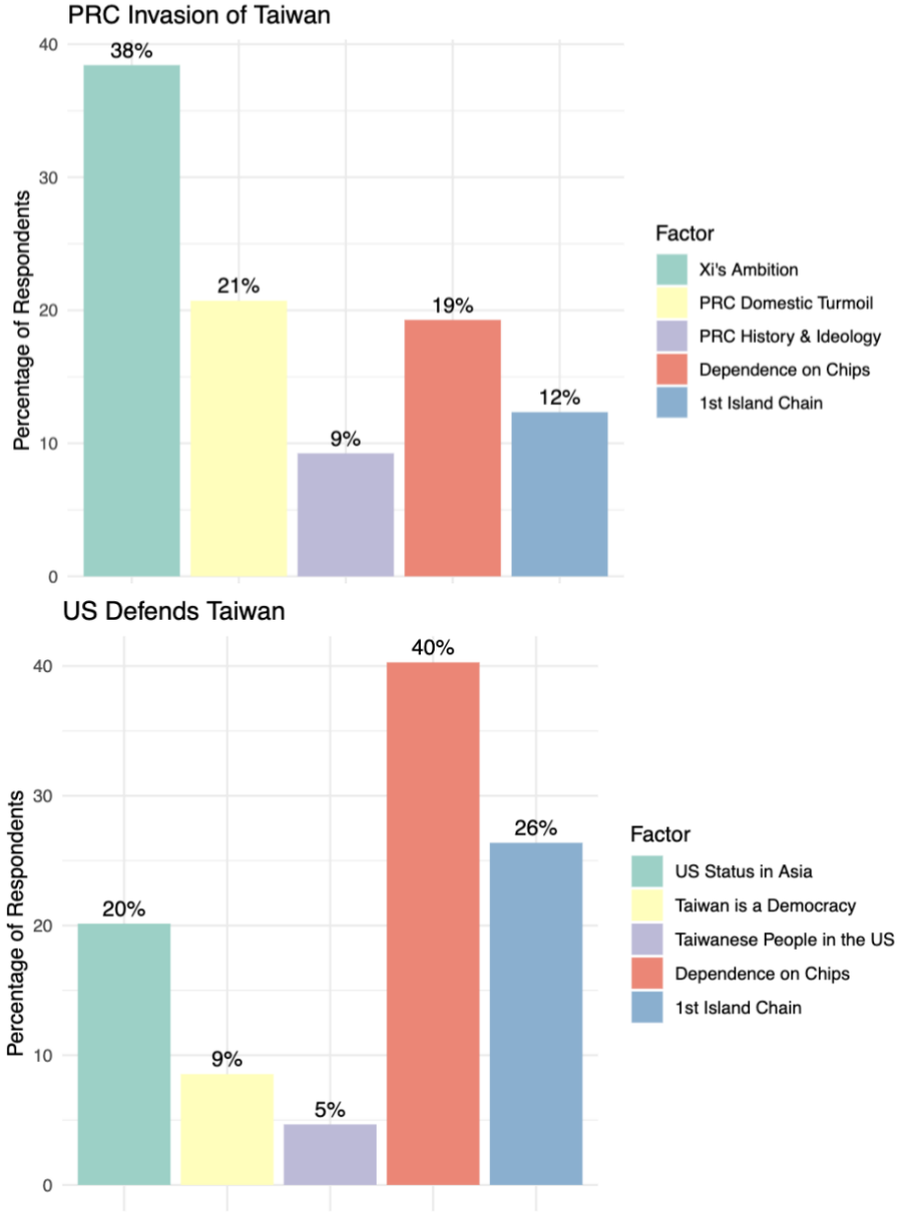
Before beginning the regression analysis, I probed the assumption that semiconductor issues are salient in Taiwan. First, I compared reported frequency of reading news on international relations and technology compared to three other news types: education, pop culture, and sports, the results for which are displayed in Figure 4.4. Over 80% of respondents reported reading about international relations and semiconductor issues *every week*. While respondents reported reading the news frequently for other types of news, their percentages were substantially lower — 68% of respondents reported reading about education issues every week, while 57% reported reading about sports every week. In addition to the very high reported engagement with these topics, the uniquely high salience of international relations and technology issues compared to others suggests they were might have been relatively important to Taiwan's voters and thus areas where public opinion is likely to matter more.

Figure 4.4: Taiwanese People Read More on IR and Tech than Other News
Distribution of Frequency of Engaging with Different Types of News



A second key indicator of whether respondents understood geopolitics was whether they varied in their assessment of the factors most likely to influence the PRC decision on whether to invade Taiwan compared to the facts most likely to drive US defense should the PRC invade. In theory, global dependence on chips is relatively unlikely to motivate a PRC invasion of Taiwan. An invasion is more likely to be driven by domestic factors such as Xi Jinping's ambition or a diversionary war amidst a sluggish economy. In contrast, chip dependence is much likely to play a role in the U.S. calculus to defend Taiwan. As Figure 4.5 shows, Taiwanese respondents generally demonstrated a strong understanding of this logic: 40 percent of respondents thought PRC dependence on chips was the most important factor for US defense of Taiwan, ranked first among the five options. In contrast, only 19 percent of respondents listed dependence on chips as the most important factor of a PRC invasion of Taiwan, trailing Xi Jinping's personal ambition (38%) and domestic turmoil in the PRC (21%). Although this question was asked post-treatment, respondents did not vary significantly according to treatment assignment, as I show in Appendix A. These charts suggest respondents are not only aware of international relations but were critically engaging with the questions they were asked.

Figure 4.5: Factors Most Likely to Influence Taiwan Scenario Actors



To ensure the validity of the results, I subjected the results to a series of robustness checks. First, I re-specified the primary export control regression as an ordered logit regression, moving from a broad oppose/support dichotomy to a more granular strongly oppose/probably oppose/probably support/strongly support scale, the results of which are displayed in Table 4.4. As with the initial regression, individuals primed with information about PRC tech competition were more likely to accept a 10 percent increase in the cost of living to impose export controls, findings that hold across all three regressions at the 99 percent confidence level. Moreover, KMT and TPP voters were on average less likely to accept a 10 percent increase in the cost of living to impose export controls, findings that hold across all three regressions at the 99 percent confidence level, confirming the binomial logit findings. The only finding that differed in the ordered logit was age — all coefficients remain positive, but only

those age 60-69 were statistically significantly more likely to accept price increases from export controls compared to those in the 20-29 reference category.

Table 4.4: Willingness to Accept Price Increases as a Result of Export Controls (Ordered Logit)

	Dependent variable:				
	Accept Cost of Living Increase				
	Country	2024 Vote	Age	Combined	All Controls
	(1)	(2)	(3)	(4)	(5)
countryUS	0.159			0.215*	0.175
	(0.113)			(0.115)	(0.120)
countryChina	0.357***			0.395***	0.412***
	(0.114)			(0.115)	(0.121)
vote2024Hou You-yi (KMT)		−1.240***		−1.271***	−1.004***
		(0.119)		(0.120)	(0.133)
vote2024Kou Wen-je (TPP)		−1.049***		−1.017***	−0.899***
		(0.110)		(0.112)	(0.120)
vote2024Didn't vote		−1.100***		−1.098***	−0.895***
		(0.137)		(0.137)	(0.146)
vote2024Prefer not to say		−1.324***		−1.295***	−1.153***
		(0.226)		(0.227)	(0.241)
age30-39			0.109	0.078	0.098
			(0.141)	(0.143)	(0.155)
age40-49			0.283**	0.212	0.245
			(0.137)	(0.140)	(0.152)
age50-59			0.012	0.032	0.186
			(0.151)	(0.155)	(0.167)
age60-69			0.338**	0.343**	0.528***
			(0.161)	(0.168)	(0.180)
age70+			0.400*	0.219	0.215
			(0.227)	(0.232)	(0.244)
Observations	1,969	1,969	1,969	1,969	1,807
Note:					*p<0.1; **p<0.05; ***p<0.01

Second, in addition to measuring responses to the simple binary question of whether respondents would accept a 10% increase in the cost of living, respondents were recategorized based on a series of follow-

up questions that narrowed in more precisely the range of values respondents reported they would accept — buckets of 0-5%, 5-10%, 10-15%, and 15%+, the results for which are displayed in Table 4.5.

Table 4.5: Willingness to Accept Price Increases as a Result of Export Controls (Varied Cost of Living Thresholds)

	Dependent variable:				
	Accept Cost of Living Increase				
	Country	2024 Vote	Age	Combined	All Controls
	(1)	(2)	(3)	(4)	(5)
countryUS	0.060			0.111	0.065
	(0.116)			(0.119)	(0.126)
countryChina	0.225*			0.253**	0.234*
	(0.117)			(0.119)	(0.126)
vote2024Hou You-yi (KMT)		−1.047***		−1.057***	−0.783***
		(0.120)		(0.122)	(0.136)
vote2024Kou Wen-je (TPP)		−0.922***		−0.884***	−0.759***
		(0.111)		(0.113)	(0.123)
vote2024Didn't vote		−0.981***		−0.979***	−0.777***
		(0.140)		(0.141)	(0.152)
vote2024Prefer not to say		−1.327***		−1.298***	−1.170***
		(0.246)		(0.247)	(0.262)
age30-39			0.149	0.130	0.229
			(0.144)	(0.147)	(0.160)
age40-49			0.358**	0.304**	0.421***
			(0.139)	(0.143)	(0.156)
age50-59			0.053	0.070	0.221
			(0.156)	(0.161)	(0.174)
age60-69			0.314*	0.288*	0.507***
			(0.163)	(0.172)	(0.185)
age70+			0.468**	0.340	0.318
			(0.229)	(0.237)	(0.253)
Observations	1,923	1,923	1,923	1,923	1,766
Note:					*p<0.1; **p<0.05; ***p<0.01

In this robustness check, the results for both country treatment and vote 2024 both held (though at only the 93 percent confidence level for country treatment in regressions 1 and 5). Moreover, age was a positive and a statistically significant predictor for willingness to accept cost of living increases for those in the 40-49 (95% confidence), 60-69 (90% confidence), and 70+ groups (95% confidence), results which held in the multivariate regressions for the former two.

In addition to the regression re-specifications, the results largely performed well when subjected to robustness checks testing attention, fact recall, and priming effects. First, at two different points throughout the survey, respondents were asked first asked to identify the Taiwanese firm that produces semiconductors (TSMC) and later the founder and CEO of TSMC. Over 97% of respondents answered *both* questions correctly, providing further evidence that semiconductor and TSMC issues were highly salient in Taiwan at the time of the survey. Second, for treated respondents, when asked whether they believed the treatment, fewer than 5 percent of respondents expressed significant doubt over the international expert's analysis, with 21.9 percent expressing a small degree of concern. While the number of doubters was non-zero, the high percentage of those who believed the treatment more generally underscores the construct validity of the vignette. Finally, when asked to recall the threatening country in the vignette, two-thirds of respondents recalled the threatening country correctly, revealing strong — though imperfect — uptake of the treatment, suggesting the vignette was generally received as intended. Finally, I tested whether providing respondents assigned to the U.S. vignette with information about active efforts to onshore Taiwan semiconductor technology affected their preferences, the results for which are included in Appendix A. Priming respondents was not statistically significantly associated with willingness to pay, and the results did not change when the primary binary logit cost-of-living regressions were re-run to include these additional experimental groups, suggesting the vignette was robust to technical wording differences.

4.7 Conclusion

The battle to produce the world's most critical emerging technologies is not simply a structural battle among competing states, it is also a battle to win public opinion and achieve buy-in from individuals who provide necessary domestic support. These individuals face a challenging trade-off between pocketbook economics and collective security and strategic advantages. When emerging technology issues are publicly salient, the preferences of individuals facing these trade-offs can in aggregate shape whether a given country is able to maintain its technological advantage. Three threats are critical to understanding whether publics will pay for strategic advantages in the long-run: tech competition, partisanship, and age-based demographic change.

When faced with external competition from an adversary seeking superiority in a critical technology, publics rally around their strategic technological advantages: an original spring 2024 survey experiment of 2,500 respondents in Taiwan revealed that respondents primed with information about PRC semiconductor manufacturing capabilities efforts were on average 7 percent more likely to be willing to

accept a 10-percent price increase compared to those in the control. However, these rally affects may be threatened by domestic factors. First, Taiwan's public reflected a strong partisan divide in willingness to pay, with voters for the opposition KMT on average 27 percent less likely to endure price increases to maintain strategic advantages, underscoring a challenge to Taiwan's long-held bipartisan consensus on the need to support its semiconductor industry. Second, younger Taiwanese are less willing to bear the personal economic costs of export controls compared to older generations, with those age 20-29 on average 11 percent less likely to accept a 10-percent increase in the cost of living than those in the 70+ bracket. Taken together, this research shows that threats to Taiwan's semiconductor chokepoint come not just from great powers on the outside but from party dynamics and changing demographic dynamics on the inside, reflected in individual-level variation in willingness to endure chokepoint costs across parties and ages. Despite Taiwan's public meaningful willingness to make pocketbook sacrifices in the face of changes in the external threat environment, these domestic divisions could have important implications for Taiwan's ability to leverage global dependence on semiconductors to preserve deterrence in the Taiwan Strait.

This paper makes important theoretical, empirical, and policy contributions. First, this paper underscores that technological advantages, including sought-after technological chokepoints, have domestic constraints. Specifically, I introduce three different sources of threats to the maintenance of technological production advantages. External challenges to technological superiority can increase domestic publics' willingness to pay, raising the costs of competition for adversaries. Internal threats, including partisanship and age, underscore potential weak points within the state that constrain a country's usable power in critical technology development. Empirically, I provide substantial data on public preferences on Taiwan's semiconductor industry at a critical juncture for global semiconductor competition and cross-Strait relations amidst fears of a Taiwan invasion scenario. Understanding Taiwan's public perspective is also normatively important, as voices from Taiwan become squeezed out amidst growing global policy and media attention on the growing prospect of great power war.

Finally, my research has important policy implications. Taiwan's leadership must figure out how to avoid substantial partisan division on semiconductor industrial policy. The KMT has not held power since 2016, raising the question of whether semiconductor policy would change if it gained control of the presidency in 2028 and was supported by a demographic primarily concerned with cost-of-living increases or frustrated with Taiwan government's strong prioritization of the semiconductor industry at the expense of other key industries. As Taiwan reckons with the costs of maintaining its Silicon Shield, its partners — most critically the United States — should consider how their industrial policies can

complement Taiwan's emerging technology chokepoint, acknowledging both the domestic challenges associated with Taiwan's chokepoint maintenance and the strategic and economic advantages of ensuring some frontier semiconductor manufacturing capability remains in Hsinchu and Tainan.

This paper moves the needle on establishing the relationship between willingness to tolerate personal financial costs and partisan affiliation and age, respectively. However, further research should seek to more clearly identify the mechanism shaping these results. In the case of partisanship, further research should address the question of whether willingness to pay preferences are top-down or bottom-up — do voters support a given party because they hold a certain financial preference profile, or because they support a given party are willing to support certain policies? In the case of age, future research should try to separate out age-differentiated dynamics. Older people may always be willing to pay more for strategic advantages, or contextually specific dynamics may shape preferences, such as attitudinal divisions between those who grew up before and after Taiwan's White Terror Period.

Finally, this paper provides important avenues for further research. First, future research should explore the willingness to bear personal financial costs in a military defense context as opposed to a tech competition context, given the potential acute demand from U.S. leadership that Taiwan pay more for its defense. Second, further research should explore cross-country variation in individual willingness to pay to maintain advantages in critical technology. How much are Dutch respondents, for example, willing to individually pay to maintain their advantages in semiconductor lithography? The question is critical not just in the semiconductor supply chain but also across key industries ranging from biotechnology to electric vehicles. Third, future research should try to understand the preferences of important but relatively difficult to study demographics, TSMC engineers, and the strategically important non-financial trade-offs they face. Understanding the factors driving TSMC engineers' willingness to immigrate, for example, is critical for understanding global emerging tech talent competition. These demographics are currently difficult to study through survey experiments sampling the public. Finally, future research should explore how responsive policymakers are to public attitudes on emerging technology production, leveraging both historical work and quantitative elite experiments to connect these individual-level preferences to concrete policy outcomes.

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Appendix A: Survey Respondent Recruitment Statement

The following information, written by National Taiwan University Web Survey, articulates their survey respondent recruitment process:

Sample Recruitment and Sample Blocking

Experimental subjects will be drawn from the National Taiwan University Web Survey (hereafter NTUWS) online panelists database. Subjects are recruited via mixed-mode method that utilizes primarily online opt-in, augmented with periodic random digit dialing (RDD) and face-to-face invitation-to-join within smaller Primary Sampling Unit (PSU) using GIS sampling.

The NTUWS database recruits panelists who are 1) above 20 years of age, 2) are Taiwanese nationals who 3) had stayed in Taiwan for more than 183 days last year, 4) have valid cell phone numbers. Users recruited through the above venues will be redirected to the registration page and being prompted with the NTUWS's statement of purpose, informed consent form, privacy policy, and other announcements (such as informing users that they will be selected to participate in other studies at some future dates). Upon completing registration, users will receive a monetary reward of NTD 50 (approx. 1.21 GBP) stored in e-coupon and sent via SMS to users' registered cell phone numbers.

As the time of writing, the NTUWS database has more than 43,000 panelists.

A detailed description of the NTUWS's recruitment methods, panelist characteristics, panel retirement criteria, and data storage is available at the NTUWS's webpage.

Subjects for this study will be drawn from the NTUWS database using stratified sampling based on panelists' registered gender, age, and regions of residence (which are stored in the NTUWS database), forming a total of 72 block quotas. 2,500 subjects were to be drawn from the database, satisfying all four criteria stated above and 5) must have completed more than 2 surveys previously dispatched by the NTUWS website to ensure subjects' authenticity and compliance rates.

Being of panel data, the NTUWS database also contains other information for each panelist, including records of their responses to other survey questions (such as partisan orientation, purchasing behaviors, etc.), but these data will not be used as embedded data nor for profiling in this study because this study does not involve repeated measures or longitudinal analysis.

Implementation: Sampling, Opted-in, Rewards, and Data storage

A total of five samples (equal to the target sample size (N = 2,500)) were drawn from the NTUWS database using stratified sampling to account for non-response. For each sample, two waves of SMS (Short Message Service) will be sent within a 5-day period to notify subjects that they have been selected to participate in this study. Subjects who receive the SMS can click on the URL embedded in the message or go directly to the NTUWS survey page, login and complete the survey. If the first sample

cannot gather enough responses in the 5-day period, it will be retired and then the second sample will be used. So on and so forth.

Subjects who logged in, validated their information, and completed the survey will receive a reward of NTD 50 (approx. 1.21 GBP) in e-coupon (sent to their registered cell phone numbers) immediately after their responses are recorded in the NTUWS's database.

Survey responses will be stored in both the NTUWS's database and the researcher's (your) Qualtrics survey account for three years as required by the research ethic committee of the NTUWS' affiliated university (National Taiwan University). Only the researcher can access the data at the analysis stage.

All identifiable information of each response will be masked. Responses can only be identified through panelist ID upon request by the panelists themselves or the research ethic committee should the needs arise. Panelist IDs are stored in a separate file and can only be retrieved from an off-line storage device (a network-attached storage (NAS)) managed by NTUWS staffs. All identifiable information of the data will be masked prior to release at a future date upon the approval by the research ethic committee of the researchers' affiliated university.

Appendix B: Distribution of Covariates, Balance Checks, and Additional Robustness Checks

Figure 4.B1: Distribution of Primary Treatment Assignments

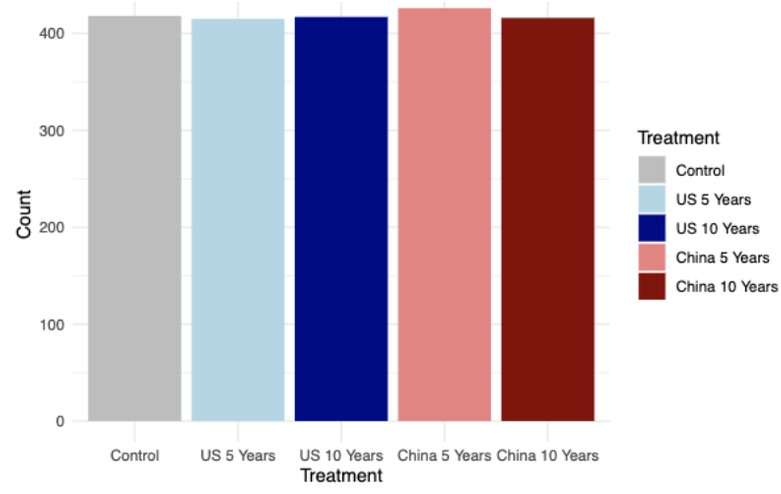


Figure 4.B2: Distribution of Treatment Assignment by Age

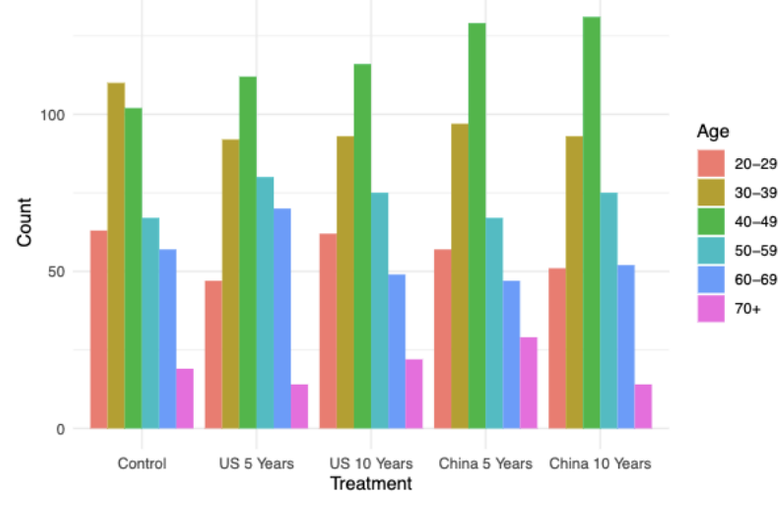


Figure 4.B3: Distribution of Treatment Assignment by Gender

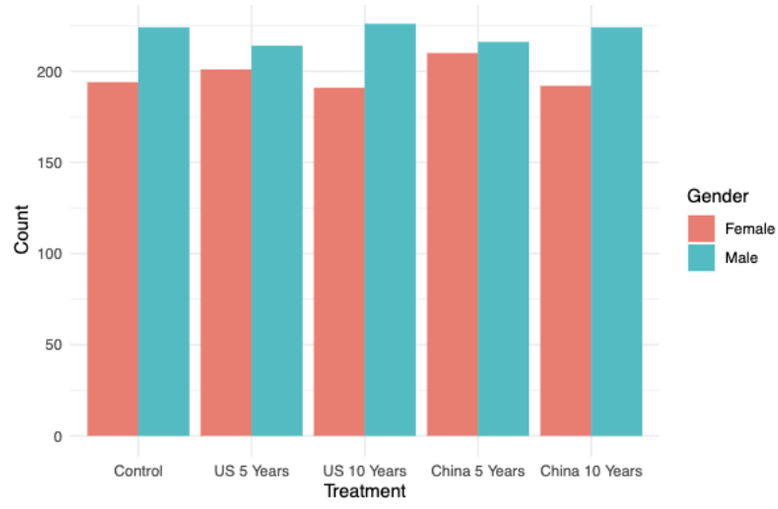
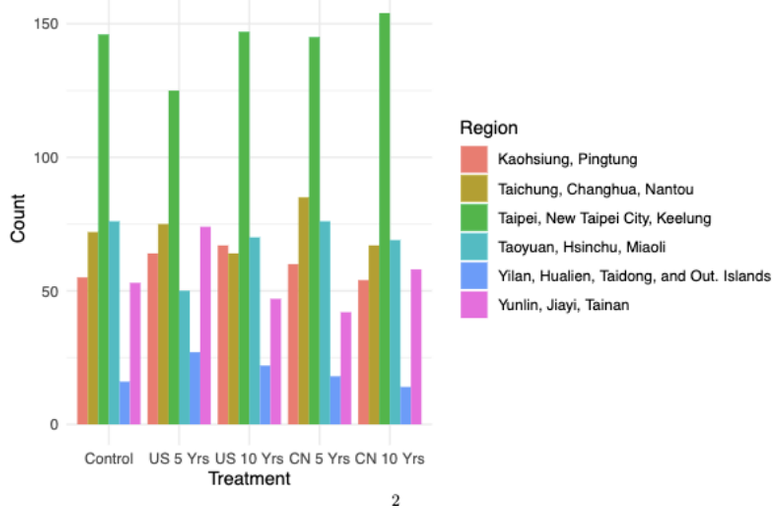


Figure 4.B4: Distribution of Treatment Assignment by Region



2

Figure 4.B5: Distribution of Treatment Assignment by Ethnic Group

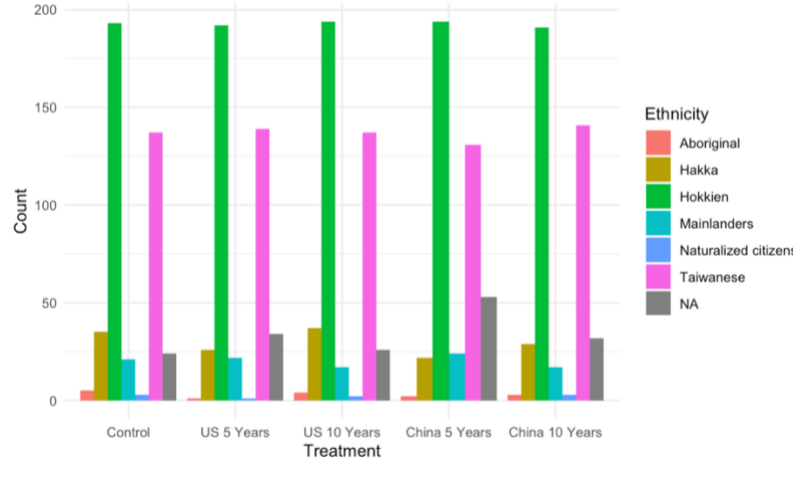


Figure 4.B6: Distribution of Treatment Assignment by Marital Status

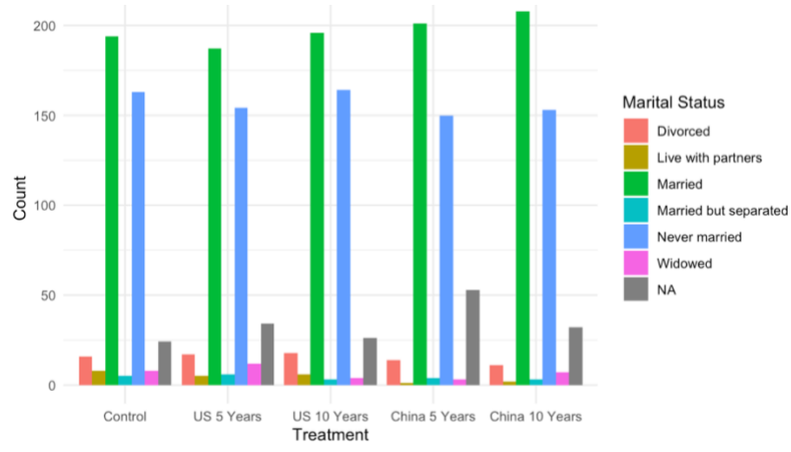


Figure 4.B7: Distribution of Treatment Assignment by Education

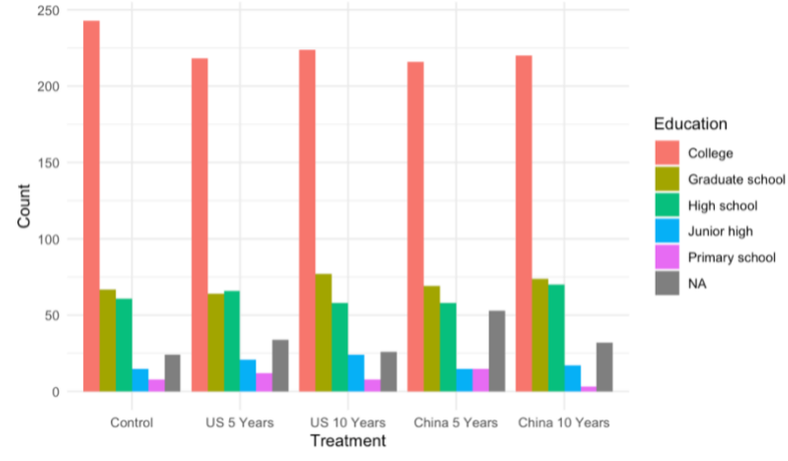


Figure 4.B8: Balance Checks on Treatment Assignment

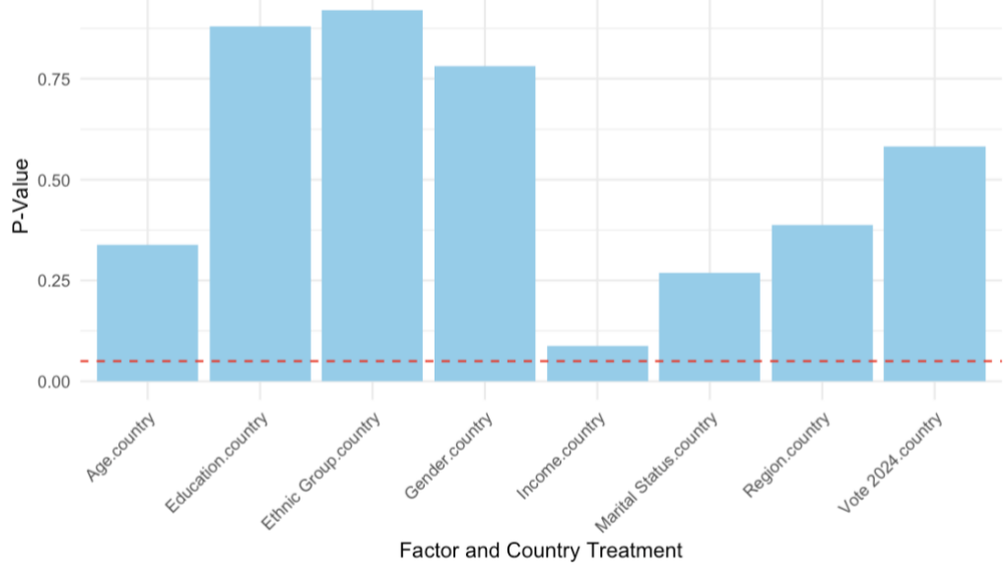


Table 4.B1: Robustness Check: Priming Respondents with U.S. Onshoring

	Dependent variable:	
	Accept Cost of Living Increase	
	Bivariate	Multivariate
	(1)	(2)
primary_analysis	0.148	0.095
	(0.123)	(0.140)
countryUS		0.189
		(0.128)
countryChina		0.355***
		(0.129)
vote2024Hou You-yi (KMT)		−1.176***
		(0.122)
vote2024Kou Wen-je (TPP)		−0.895***
		(0.116)
vote2024Didn't vote		−0.990***
		(0.141)
vote2024Prefer not to say		−1.415***
		(0.248)
age30-39		0.277*
		(0.149)
age40-49		0.411***
		(0.144)
age50-59		0.178
		(0.161)
age60-69		0.420**
		(0.174)
age70+		0.687***
		(0.244)
Constant	0.065	0.295
	(0.114)	(0.215)
Observations	2,277	2,277
Log Likelihood	−1,567.021	−1,486.705
Akaike Inf. Crit.	3,138.041	2,999.409
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 4.B2: Effect of External Competition on Willingness to Accept Price Increases as a Result of Export Controls (Extra Treatment Groups)

	Dependent variable:				
	Accept Cost of Living Increase				
	Country	2024 Vote	Age	Combined	All Controls
	(1)	(2)	(3)	(4)	(5)
countryUS	0.113			0.162	0.146
	(0.118)			(0.122)	(0.128)
countryChina	0.329***			0.355***	0.383***
	(0.124)			(0.129)	(0.136)
vote2024Hou You-yi (KMT)		−1.154***		−1.176***	−0.865***
		(0.120)		(0.122)	(0.138)
vote2024Kou Wen-je (TPP)		−0.946***		−0.895***	−0.749***
		(0.113)		(0.116)	(0.125)
vote2024Didn't vote		−1.007***		−0.991***	−0.754***
		(0.140)		(0.141)	(0.151)
vote2024Prefer not to say		−1.445***		−1.414***	−1.210***
		(0.246)		(0.248)	(0.261)
age30-39			0.264*	0.279*	0.380**
			(0.144)	(0.149)	(0.161)
age40-49			0.453***	0.411***	0.524***
			(0.139)	(0.144)	(0.156)
age50-59			0.134	0.179	0.365**
			(0.152)	(0.160)	(0.173)
age60-69			0.368**	0.422**	0.601***
			(0.163)	(0.174)	(0.187)
age70+			0.784***	0.687***	0.688***
			(0.232)	(0.244)	(0.260)
Constant	0.025	0.900***	−0.104	0.389**	−1.221**
	(0.101)	(0.079)	(0.114)	(0.164)	(0.590)
Observations	2,277	2,277	2,277	2,277	2,096
Log Likelihood	−1,563.434	−1,498.373	−1,557.829	−1,486.937	−1,341.764
Akaike Inf. Crit.	3,132.869	3,006.747	3,127.659	2,997.874	2,749.527
Note:					*p<0.1; **p<0.05; ***p<0.01

Appendix C: Survey Experiment (Chinese)

您的手機號碼
[open-ended]

您的信箱
[open-ended]

問卷代碼
[open-ended]

您的生理**性別**
[男性/女性]

您的**年齡**
[20~29 歲/30~39 歲/40~49 歲/50~59 歲/60~69 歲/70 歲以上]

您的**居住地區**
[北北基/桃竹苗/中彰投雲嘉南/高屏/宜花東或外島(金馬澎)]

請問您比較偏向以下關於兩岸關係長遠發展的看法的那一種？
[儘快宣布獨立/維持現狀，以後走向統一/永遠維持現狀/維持現狀，以後走向獨立/盡快統一/不知道/傾向不回答]

如果您被要求對前述的兩岸關係發展途徑選擇一種立場的話，您會**較偏向**哪一種？
[儘快宣布獨立/維持現狀，以後走向統一/永遠維持現狀/維持現狀，以後走向獨立/盡快統一/不知道]

您較常閱讀以下主題的新聞的頻率:

- 國際關係
- 科技
- 教育
- 體育
- 娛樂

[每天/每週/每月/每年從不]

您對以下國家的看法如何?
排序 1 至 5
1 代表最正面、5 代表最負面
[美國/中國/新加坡/巴基斯坦/立陶宛]

請問您在今年(2024)一月的總統大選中投給了下列哪一個候選人?
[賴清德 (民主進步黨)/ 侯友宜 (國民黨)/ 柯文哲 (台灣民眾黨)/沒有去投票/沒有去投票]

您個人月收入水準為多少?
[40,000 元以下/40,001~55,000 元/55,001~70,000 元/70,001 元以上/傾向不回答]

這些公司當中，哪一家發展半導體？
[台積電/五月天/全家/鼎泰豐/不知道]

Control: 全球最先進的半導體有 90%產於台灣。由於先進半導體對全球經濟極其重要，有人認為台灣在此領域的技術領先對台灣的國家發展有相當的重要性。

Treatments: 全球最先進的半導體有 90%產於台灣。由於先進半導體對全球經濟極其重要，有人認為台灣在此領域的技術領先對台灣的國家發展有相當的重要性。然而，諸如美國等國家正投入數十億美元提升半導體產業，並減少對台灣的依賴。國際專家預估，最早在【2029/2034】年，【美國/中國】將超越台灣成為生產半導體的主要國家。

Robustness Checks: 全球最先進的半導體有 90%產於台灣。由於先進半導體對全球經濟極其重要，有人認為台灣在此領域的技術領先對台灣的國家發展有相當的重要性。然而，諸如美國等國家正投入數十億美元提升半導體產業，並吸引海外晶片製造業者赴美生產，以減少對台灣的依賴。國際專家預估，最早在【2029/2034】年，美國將超越台灣成為生產半導體的主要國家。

因為如此，您對採取以下做法的支持或反對程度為何？
#排序數字越低代表越支持、序位越高；越高則代表越反對，序位越低。例如，由上至下的序位為 1, 2, 3, 4 分別對應最支持、支持、反對、最反對。
[即使我可能會賠錢，我也願意繳付 5%的所得稅買台積電股票/如果有機會，我會移民去其他國家/我認為台灣應該更積極地與中國尋求和平協議/即使損害經濟，我也投給支持限制出口先進半導體晶片的政黨]

您前面回答您**最支持**"${q://QID15/ChoiceGroup/ChoiceWithLowestValue}"。請問您為何選擇**最支持**該選項？
#請在下方鍵入您的理由
[open-ended]

您前面回答您**最反對**"${q://QID15/ChoiceGroup/ChoiceWithHighestValue}"。請問您為何**最反對**該選項？
#請在下方鍵入您的理由
[open-ended]

限制半導體出口會損害經濟。您是否支持政府採取以下措施？
分數越高表示越**支持**，越低則代表越**反對**
[限制向競爭對手銷售最先進的半導體晶片/限制向競爭對手銷售半導體晶片/限制向全球銷售半導體晶片]
[Scale 0-10]

您願意花費年收入的百分之多少購買**台積電**(代碼 2330)的股票？
[0/少於 5%，但高於 0/5-10%/10-15%/多於 15%]

您願意花費年收入的百分之多少購買**長榮集團**(代碼 2603)的股票？
[0/少於 5%，但高於 0/5-10%/10-15%/多於 15%]

您認為台積電的股價在未來五年的表現會如何？
[非常好/相當好/相當壞/非常壞/不知道]

如果你計畫移民至其他國家，你傾向移民到哪一國？
[美國/中國/日本/德國/不知道]

限制半導體出口會損害經濟。即使這樣會增加 10%的生活成本，您還是否支持台灣政府採取該措施？
[強烈支持/可能支持/可能反對/強烈反對/不知道]

If 強烈支持 *or* 可能支持 *is selected:*
限制半導體出口會損害經濟。即使這樣會增加 15%的生活成本，您還是否支持台灣政府採取該措施？

[強烈支持/可能支持/可能反對/強烈反對/不知道]

If 強烈反對 *or* 可能反對 *is selected:*
限制半導體出口會損害經濟。即使這樣會增加 5%的生活成本，您還是否支持台灣政府採取該措施？
[強烈支持/可能支持/可能反對/強烈反對/不知道]

台積電的創辦人是誰？
[張忠謀/鄧麗君/蔡英文/孫中山/不知道]

您認為在接下來的[5/10]年內:
中國會入侵台灣
若中國入侵台灣，美國會派遣軍隊協助台灣防禦
[Scale 0-100]

以下哪些因素對中國入侵台灣有最大的影響？
[習近平個人對統一的渴望/中國國內政治或經濟動盪/中國的歷史敘事和意識形態/全球半導體產業對台灣的依賴/第一島鏈的戰略價值]

若中國入侵台灣，以下哪些因素對美國派遣軍隊協助台灣防禦有最大的影響？
[美國需要維持在亞洲地區的聲譽和地位/台灣是民主國家/台灣人在美國的影響力/全球半導體產業對台灣的依賴/第一島鏈的戰略價值]

根據您先前閱讀的文本，國際專家預估其他國家將超越台灣成為先進半導體的主要生產者，根據專家的分析，超過台灣的國家是哪一個？
[美國/中國/德國/日本/不知道]

根據您先前閱讀的文本中國際專家的分析，在接下來的多少年內其他國家將超越台灣成為半導體製造大國？
[1/5/10/30/不知道]

根據先前您閱讀的文本，您認為專家對半導體產業的風險評估準確嗎？
[絕對準確/可能準確/不好不壞/可能不準確/絕對不準確/不知道]

您個人認為，其他國家越台灣成為先進半導體生產者的可能性有多大？/您個人認為在接下來的[5/10]年內，［美國/中國］超越台灣成為先進半導體製造者的可能性有多大？
[0-10]

Chapter 5

Beyond Bombs: The Effect of Non-Material Mechanisms of Civilian Exposure to Violence on Public Opinion During the 2014 Israel-Gaza War

Abstract

How does civilian exposure to violence affect their attitudes toward conflict? For many, civilian exposure to violence has been traditionally understood to require and been measured using indicators of material violence. I challenge the exclusive centrality of material violence by disaggregating violence exposure into three key mechanisms: material violence, uncertainty, and traumatic triggering. Each mechanism demands different counter-terrorism solutions. To test the implications of a theory based on non-material mechanisms, I employ geospatial data on a pivotal case for my theory: Israeli sirens during the 2014 Israel-Gaza War, which followed substantial technological improvements in anti-missile defense technologies. I show siren exposure was associated with localized increases in hawkish policy support: exposure to 50 sirens was associated with increased support for ground troop interventions on either a limited scale (+32%) or to topple Hamas (+25%) and decreased support for immediate ceasefires (-21%) and negotiations (-20%). Thus, while violent episodes that do result in material damage also cause significant fear and disruption, this paper suggests significant fear and disruption can be created without causing damage. As anti-missile defense technologies improve, these non-material mechanisms may become more important over time.

Beyond Bombs: The Effect of Non-Material Mechanisms of Civilian Exposure to Violence on Public Opinion During the 2014 Israel-Gaza War[1]

"Even though we have Iron Dome and it has destroyed most of the rockets, just to hear the sirens shouting, it makes us like animals. You think: what will happen in the next minute?"

–ALON DAVIDI, MAYOR OF SDEROT, ISRAEL, OCTOBER 2020

5.1 Introduction

The city of Sderot, located one kilometer from the Gaza border, is a paradise 95 percent of the time in the eyes of its mayor, Alon Davidi. He notes how open the desert landscape is, celebrates the city's proximity to the beautiful Mediterranean Sea, and exults in the incredible development he has overseen.[2] But the other five percent of the time, he says, Sderot is a "living hell." Sderot residents experienced the acute horrors of the October 7, 2023 Hamas attacks, becoming a key battleground that saw 50 civilians and 20 police officers lose their lives (Rosenbaum 2023).

But Davidi was referring to a different threat that long pre-dated the current conflict and that will long outlast it: the presence of showers of rocket fire that have colored Sderot's sky since Hamas first began firing rockets and mortars over the Border Wall in 2008. In just the first five weeks of the current conflict, Israel said it had intercepted 9,500 rockets from Hamas and Hezbollah (Bob 2023), and it has intercepted thousands more since then. Yet of the thousands of rockets launched from Gaza, most will never fall. The Iron Dome anti-missile defense system prevents approximately 90 percent of rockets that threaten to hit populated areas (Williams 2014).

[1] I acknowledge funding from the University of Oxford's Clarendon Fund and Balliol College. I am grateful to Janina Dill, Meir Elran, Todd Hall, Addi Haran Diman, Sypros Kosmidis, Beth Mann, Karolina Milewicz, Carl Müller-Crepon, Andrea Ruggeri, Jakob Schram, Duncan Snidal, and participants at the 2022 European Workshop in Empirical Political Social Science at the Hertie School, 2022 Peace and Conflict Hub workshop, 2021 University College London Conflict & Change Workshop, Brasenose College Workshop, and University of Oxford DPhil seminar for their feedback on various elements of the paper.
[2] Davidi, Zoom Interview with Author, 2020.

For many Israelis today, the experience of rocket fire is only occasionally accompanied by material violence thanks to substantial technological advancement in and increased deployment of anti-missile defense technologies. But no matter how much Israel's defense improves, the rocket fire is always accompanied by the sirens that signal their impending threat, creating a battlefield not on the ground but inside the mind. The trauma from a previous era, when the siren did mean a rocket would fall, along with the possibility a rocket could land again, bubbles to the surface each time the alarm blasts anew. "Even though we have Iron Dome and it has destroyed most of the rockets, just to hear the sirens shouting, it makes us like animals," Davidi said during a 2020 interview, before the October 7 attacks. "You think: what will happen in the next minute?"

Davidi's story, and the sirens' ability to influence civilians during the post-Iron Dome period when most material damage has been largely eliminated during rocket attacks, points to a broader phenomenon in political violence: heavy costs can be imposed on civilian populations without a single building destroyed or bone broken. Given that much of our understanding of terrorism[3] explicitly relies on the presence of a material facilitator of violence on a civilian population, the presence of rockets in the air, but devoid of an explosion on the ground, presents a puzzling phenomenon for political scientists. How then, does civilian exposure to violence affect their attitudes toward conflict? Israel's experience suggests that scholars have over-aggregated terrorism exposure, demanding a conceptualization of the different mechanisms through which terrorism influences attitudes is needed.

I argue that exposure to violence can be conceptually disaggregated into three key components: material damage along with two psychological mechanisms: uncertainty over the possibility of material violence and triggering trauma. Each of these three components influence civilians through different mechanisms and impose costs on civilian populations in different ways. As such, while terrorism episodes that do result in material damage also cause significant fear and disruption, there can be significant fear and disruption created without causing damage. All else equal, as the accuracy of anti-missile defense technologies improves, these non-material mechanisms may play a proportionally more important role than material violence in shaping Israeli attitudes toward the use of force.

These psychological mechanisms are common not just in conflicts across the Gaza Border but also across Ukraine in the year following Russia's invasion, when air raid sirens sounded 15,000 times (Soler et al. 2023). Historically, sirens have accompanied aerial threats in many violent conflicts since World War II (Elster, Zussman, and Zussman 2019: 311), such as in the UK during the Blitz, in the USSR

[3] While my claims about the civilian experience of exposure to violence applies in terrorism contexts, they apply more broadly to any case when civilians are targets of violence. In this case, the use of the word "terrorism" is applicable when describing the use of indiscriminate violence against civilians in service of a strategic goal.

during the Battle of Leningrad (Kirschenbaum 2006: 64), the Iran-Iraq War, First Gulf War, Syrian Civil War (Dadouch 2018), and most recently in Ukraine following Russia's invasion (Ramzy 2022). It is also true of other instances of non-material mechanisms impose meaningful costs on civilians, such as the very sound of fighter jets flying overhead Germany during World War II (Beck 1986), Troubles-era warning phone calls delivered from the Provisional IRA (Brown 2020), and anonymous threats to shoot at students in U.S. high schools. Together, these examples illustrate that exposure to violence involves much more than an explosion on its own.

The implications for my argument are critical for political violence literature more broadly. First, foundational public opinion literature within international security focuses predominantly on the role of casualties in conflict (e.g. Gartner 2008; Gelpi, Feaver, and Reifler 2006, 2009) — non-material mechanisms that link will force IR scholars to think about when and how casualties matter, and how they matter differently from other consequences of violence. Second, if significant costs can be imposed on civilian populations without material damage, then counter-terrorism provision which focuses only on preventing violent attacks may address important symptoms of violence but fail to address other core issues. From the perspective of the aggressor, inflicting significant costs without causing material damage can 1) produce audience effect benefits (Abrahms 2018), 2) minimize financial expenditure, and 3) escape extant counter-terrorism measures, all of which are central to asymmetric warfare strategies. For scholars studying the effective provision of counter-terrorism (Benmelech, Berrebi, and Klor 2015; Bueno de Mesquita 2007; R. Powell 2007; Sinai, Fuller, and Seal 2019), and for policymakers in countries with substantial defense budgets, identifying all of the key mechanisms through which costs are imposed is critical for developing strategies for and effectively allocating resources to different counter-terrorism efforts.

To evaluate the potential implications of these non-material terrorism mechanisms, I use geospatial regression to examine how variation in the number of siren alarms experienced during the 2014 Israel-Gaza War are related to individual attitudes toward peace and conflict. Peace and conflict attitudes are both a means of measuring degree of impact and are also a variable of interest in and of themselves because public opinion influences policymaking through a range of constraining mechanisms (Haesebrouck 2019; Hewitt 1990; Payne 2020; Tomz, Weeks, and Yarhi-Milo 2020), especially for elected officials.

Israel's experience during the 2014 Israel-Gaza War represents a theoretically pivotal case for my theory, and methodologically allows me to exploit particularly high quality and unique data on the location and time of sirens. From a theoretical perspective, material damage on the Israeli side of the conflict was minimized (6 total civilian deaths and over 90 percent of rockets prevented from falling) while the

duration and intensity of conflict was otherwise long (60 days and over 3,000 rockets fired). As such, the probability that material damage drove attitude shifts is greatly reduced, suggesting that the two novel non-material mechanisms I propose may have driven cost imposition and attitude shifts. From a methodological perspective, my data on sirens as a source for statistical analysis is both novel within a social sciences context and uniquely reliable, systematically maintained, and disaggregated — to the level of locality and even the specific minute of the attack. While my research design relies on cross-sectional evidence, which prevents quantitative causal identification, my research achieves two important goals: it both provides preliminary evidence supporting my theory and offers a framework for future scholarship to causally identify the mechanisms I propose in this paper.

My findings suggest that non-material mechanisms could play a critical role in driving localized support for hawkish attitudes during conflict — consistent with previous findings for localized right-wing support. These non-material mechanisms did not induce localized rally-around-the-flag effects, however, with Netanyahu enjoying widespread support across Israel during the conflict. Exposure to terrorism-inspired psychological triggers was associated with greater support for hawkish policies. Specifically, exposure to 50 sirens was associated with a 32 percent increase in predicted probability of support a limited ground troop intervention, 25 percent increase in predicted probability of support a ground troop intervention to topple Hamas, 21 percent decrease in predicted probability of support an immediate ceasefire, and 20 percent decrease in predicted probability of support for peace negotiations with the PA for the average Israeli Jew. This effect applied only to the Jewish population, as non-Jews consistently supported dovish policies, regardless of how many sirens they were exposed to.

My paper makes theoretical, empirical, and policy contributions to our understanding of both terrorism's strategic logic and its consequences. First, in conceptually disaggregating exposure to violence, I show that terrorism operates not through one mechanism but through three — material violence, disruptive uncertainty, and triggering trauma. Each mechanism requires a different solution to counter it, and the relative importance of each mechanism will be dramatically shaped by technological advances. The preliminary empirical test of my theory, which exploits siren alarms as a new source of data in social science to think about these questions, offers a useful research design framework to test the effect of non-material mechanisms on a range of other important variables in both Israel and other countries with siren alarm data like Ukraine. Finally, my paper makes an important policy contribution by suggesting policy avenues to address the mechanisms driving cost imposition and attitude changes. In the Israeli context alone, US Congress grants $38 billion in military aid annually, with $5 billion in missile defense funding specifically (Sharp 2023), in addition to Israel's own defense budget. For this money to be used effectively, policymakers need to understand exactly how missiles impact civilians in the first place,

especially in light of ongoing conflict in Israel and Gaza, as well as how emerging technology advances will impact the future importance of psychological mechanisms.

It is important to recognize that while my paper demonstrates the steep costs the Israeli public endured in the form of fear and trauma during this 2014 war, the costs for civilians in Gaza were much more material and much more profound. In Gaza, the expectation of death-less warfare was a privilege that civilians were not afforded and the material damage from Israeli airstrikes was empirically indistinguishable from and closely theoretically connected to the psychological costs civilians suffered. A UN report estimated that 1,462 Palestinian civilians, of whom 299 were women and 551 were children, were killed (United Nations General Assembly 2015: 6). Another 11,231 Palestinians were estimated to have been injured (United Nations General Assembly 2015: 6). Over 500,000 Palestinians were internally displaced from their homes (United Nations General Assembly 2015: 7) and many were used as human shields by Hamas (United Nations General Assembly 2015: 16). Put simply, the physical costs endured on the Israeli side paled in comparison to those on the Palestinian side. It is my hope in sharing this research in a post-October 7 world that has witnessed the tragic death of over 40,000 Gazans in the year following (Reuters 2024) that understanding the dynamics of violence exposure within the broader context of the strategic logic of conflict may help us build a less violent and more peaceful world.

5.2 Placing Non-Material Mechanisms in the Terrorism Literature

Peace and conflict literature has long posited that terrorism is a strategic behavior, exploring the underlying logics and mechanisms that motivate it (e.g. Abrahms 2012; Fortna 2015; Kydd and Walter 2006; Lake 2002; Pape 2003). These scholars have applied and integrated rationalist explanations for interstate war flowing from Wagner (2000) with theories of other forms of political violence (Lake 2002), including terrorism.[4] On the other hand, scholars have attempted to evaluate terrorism's consequences in areas ranging from elections (Berrebi and Klor 2008; Kibris 2011; Montalvo 2011), financial markets (Chesney, Reshetar, and Karaman 2011), tourism (Drakos and Kutan 2003; Enders and Sandler 1991), social trust (Geys and Qari 2017; Godefroidt and Langer 2020), alcohol consumption (Hasin et al. 2007), and most directly relevant to this paper, political attitudes (e.g. Feinstein 2018; Friedland and Merari 1985; Getmansky and Zeitzoff 2014; Hewitt 1990).

[4] Terrorism is defined as the use of violence against civilians to achieve a strategic goal. This definition is agnostic to whether the actor committing the act of violence is a state or non-state actor (see Kalyvas 2019). While the definition of terrorism is hotly contested, this definition reflects the more commonly used action-sense definition of terrorism, placing this work in dialogue with the most relevant academic literature on the topic, and more closely reflects my civilian-targeting mechanism. The purpose of this piece is not to adjudicate existing definition of terrorism debates but to elucidate how a particular mechanism that connects violence to attitudes manifests empirically.

Terrorism has obvious psychological implications given the 'terror' root, part of a broader set of definitional debates that define the field (Saul 2019). Extant literature makes clear that imposing fear and trauma is fundamental for terrorism to impose costs on civilian populations and that psychology empirically shapes public attitudes (Canetti-Nisim et al. 2009). While there is a robust debate over how to best capture the non-tangible, such as through the psychological explanations of Greenberg, Pyszczynski, and Solomon (1986)'s Terror Management Theory, the synthesizing behavioral economic explanations of Kahneman (2012), or even the rational choices model of Becker and Rubenstein (2011) (who include fear as a variable in their terrorism analysis), scholars across disciplines have established that terrorism is about much more than the material. A complementary volume of work has demonstrated the importance of incorporating psychological explanations into terrorism literature. Exposure to terrorism has been shown to be strongly related to post-traumatic stress disorder (PTSD) and depressive symptoms (Hobfoll, Canetti-Nisim, and Johnson 2006). Moreover, psychological distress has been shown to have an impact on hostile political attitudes toward outgroups (Canetti-Nisim et al. 2009) and perceptions of threat are important predictors of support for violence against politicians (Elad-Strenger et al. 2021).

Yet there is a fundamental disconnect between literature emphasizing the psychological consequences of terrorism and empirical literature claiming to measure terrorism exposure. The treatments in these real-world empirical studies are almost always "incidents" or "deaths," (Young 2019) blunt-measure variables theoretically removed from this clearly psychological phenomenon (Montalvo 2011). This empirical gap may have two root causes. The first is conceptual. Many scholars simply assume that psychological impact occurs alongside and is empirically condensed within material violence (Kalyvas 2019: 13), while post-positivists interested in the psychological nature of terrorism would reject the very idea that we can study strategic logics or mechanisms. The second source of the gap is empirical: it is exceedingly difficult to measure non-material mechanisms in the real world. Non-material consequences are endured in an episode with a death or injury so we cannot distinguish between a response based on non-material mechanisms and one we would expect to occur with material damage. A much larger problem is that these psychological consequences occur so frequently that we cannot systematically count and analyze them. In the latter case, these triggers have hitherto been too prominent to analyze and thus considered immeasurable.

This previously unexplored measurement of non-violent mechanisms is critical in the social sciences: just as theoretical concepts drive our selection of empirical measurements, empirical measurements can provide insights into new theoretical mechanisms (Milewicz et al. 2021: 12; Swedberg 2014: 54), as sirens do here. Studying terrorism through these psychological triggers may inform our theoretical concept of

terrorism, which can be used both in explanation and then deployed in different contexts. Effective conceptualization is essential to predict — and thus reduce, hinder, and optimistically, eventually stop — terrorism.

5.3 Unpacking "Terrorism Exposure"

How then can we effectively conceptualize the distinctive components of terrorism exposure? I argue that there are three main components, each operating through a distinctive mechanism: material violence, uncertainty, and traumatic triggering. These components can be grouped between mechanisms that happen *before* vs. *after* the outcome of an attack is known. The key distinction here is that not every attack levied or threatened will be successful; threats of attacks, or triggers that make people fear an attack may soon occur, may far outnumber the number of attacks that result in material damage.

From a measurement perspective, it is most logical to begin with post-outcome material violence. While last in terms of the sequence of terrorism exposure, material violence is most intuitive and easy to measure in the empirical world, and thus most widely covered by extant literature. Whenever a bomb explodes or a gunshot wound is suffered, civilians endure costs related to the outcome of a violent attack. The costs civilians endure through material violence can take the form of a car smashed, house destroyed, power outage endured, and in most severe cases, physical injury and death. These costs are therefore highly visible and often easily quantifiable, such as the financial cost of repairing a car, rebuilding a house, or performing a life-saving operation. These costs can also be highly personal, when they result in lifelong disability or the loss of a close friend or family member.

Two additional mechanisms come into play before the outcome of the violent attack is known, which influence civilians regardless of whether a threatened attack actually results in material violence. In the case of uncertainty, we can imagine civilians facing some known or unknown probabilistic distribution that an attack will result in material violence. They may know the calculated effectiveness of their missile defense system or maybe have a loose sense of the probability an armed military officer will fire on a crowd. Here, uncertainty over the outcome pushes civilians to take highly disruptive precautions that prevent them from engaging in daily life. These disruptions could include moving into hiding or fleeing a town when a hostile enemy is approaching on land, moving to a bomb shelter when an air-raid siren sounds, or choosing not to attend an event when a verbal threat to attack is levied. Thus, while terrorism episodes that do result in damage also cause significant fear and disruption, there can be significant fear and disruption created without causing damage.

Finally, once a population has been traumatized by a material episode of violence, the mere triggering of psychological trauma is sufficient to induce a meaningful reaction. The psychological process driving this traumatic triggering effect is classical conditioning, whereby individuals exposed to an unconditional, trauma-inducing stimulus — in conjunction with an otherwise neutral stimulus — will begin to develop the same response to the neutral stimulus without the unconditional stimulus as they had with it. Terrorists can exacerbate these effects by repeatedly unleashing attacks that re-invoke this trauma and exacerbate Post-Traumatic Stress Disorder (PTSD) symptoms, a form of psychological attrition.

The traumatic triggering mechanism warrants greater elaboration, both because it lacks significant discussion as a strategic mechanism in extant literature and because its costs may be more salient in the long term. In Pavlovian classical conditioning, a trauma-inducing stimulus becomes associated with an otherwise neutral stimulus and causes individuals to respond sub-consciously to both stimuli as if they were the same. In psychological terms, an unconditional stimulus, which invokes a pathophysiological reaction in an organism, is paired with a neutral stimulus, which normally does not provoke such a reaction. However, as the unconditional stimulus becomes increasingly associated with neutral stimulus, the neutral stimulus begins to illicit the same pathophysiological response as the unconditional stimulus. In practice, multiple neutral stimuli — related to sight, sound, terrain, time of day, or particular individuals — may simultaneously become conditional stimuli. Thus, these conditional stimuli can trigger trauma even if its initially accompanied unconditional stimulus disappears.

Conditional stimuli have become salient cost-inducers across many political violence contexts. Kahneman (2012), for example, noted that he began to develop an irrational fear of buses after the material increase in suicide bombings during the Second Intifada. The implicit legitimacy of the bus bomb threat facilitated the association of the bomb and bus and subsequent sub-conscious fear-invoking reaction to the bus alone. More famously, Vietnam War veterans displayed trauma symptoms long after they returned home due to gunshot and bomb triggers (Keane, Zimering, and Caddell 1985), which formed the foundation for the original PTSD diagnosis and was also called "Post-Vietnam syndrome" or "delayed stress syndrome" (Association 1980). As a result of this traumatic triggering, many victims reexperience terrorism-induced nightmares, flashbacks, emotional distress and physical reactivity to traumatic reminders. It can also lead to severe psycho-social implications such as drug abuse, marital difficulties, suicide ideation, violence, and potential physical harm to oneself or others (Association 2013). Thus, terrorists can transform otherwise neutral stimuli into an effective way of imposing heavy costs.

The psychological costs on individuals, meanwhile, are deepened through "invisible wounds," as the symptoms associated with PTSD are not physical and therefore often stigmatized and not understood by

the wider public (Greene-Shortridge, Britt, and Castro 2007; Mittal et al. 2013). Finally, PTSD as a disease is difficult to treat and has limited therapeutics available, rendering its financial and human costs long-lasting. Documented PTSD rates are exceptionally high in many conflict areas and in some cases impact almost entire populations. 72 to 94 percent of children living in Sderot suffer from PTSD (Byman 2011: 183), with high rates also documented in Algeria, Cambodia, and Ethiopia (De Jong et al. 2001).

Depending on the underlying mechanism driving terrorism exposure, different sorts of counter-terrorism policies will be most appropriate. If material violence drives cost imposition, then counter-terrorism solutions should prioritize minimizing post-outcome over pre-outcome effects. If uncertainty is the key driver of costs, eliminating potential threats of material violence before threats are issued, as well as identifying and reducing sources of disruption, will be critical. If traumatic triggering is most salient, it will be essential for policymakers to reduce the presence of psychological triggers and focus on post-traumatic stress treatment. Each of the three mechanisms, along with suggested counter-terrorism policies, are shown in Table 5.1.

Table 5.1: Three Mechanisms of Terrorism Exposure

	Material Violence	Uncertainty	Traumatic Triggering
Pre or Post-Outcome?	Post-Outcome	Pre-Outcome	Pre-Outcome
Frequency in Conflict	Context contingent	High	High
Mechanism	Response to material loss, both financial and personal	Disruption to daily life	Symptoms associated with trauma and post-traumatic stress
Source of Costs	Material costs of destruction; physical harm/death	Fear; economic disruption	Short and long-term psychological costs; economic costs to treat trauma
Counter-Terrorism Solution	Minimize post-outcome effects of violence	Eliminate potential threats of material violence; address disruptive element of threats where eliminating is impossible	Focus on post-traumatic stress treatment; reduce presence of traumatic triggers

These mechanisms are not mutually exclusive and can operate in conjunction with each other. The Provisional IRA's warning calls to civilians in the line of fire, alerting them to leave an area before a terrorist attack during the Troubles, provide an excellent example of the traumatic triggering effect operating in conjunction with a cost-minimizing reaction. Oftentimes — such as their 1993 attack at Bishopsgate in London — a bomb would explode, creating widespread property damage, suggesting all three mechanisms were present. However, in their so-called "10p" attacks, IRA members intentionally

made these calls without actually setting a bomb off, a form of hoax (Brown 2020: 43). Legitimized by both individual and collective trauma from previous violent attacks, British civilians would be forced to respond to the imminent threat associated with the possibility of material violence. In these cases in which no bomb exploded, the incurred costs were created through the combination of disruption due to uncertainty based on a reasonable possibility of violence along with a deep-seated psychological reactivation of fear and trauma. Leveraging uncertainty and triggering trauma appear to be central mechanisms in the IRA's strategic logic.

In terms of scope conditions, this conceptualization of terrorism exposure, and the three theoretical mechanisms that follow, should apply widely to any case where civilians are targeted by violent actors. However, non-material mechanisms will be most salient in cases of repeated violence, where individuals have previously faced non-material and even material forms of terrorism exposure. It is difficult to know how often sirens sound as one-off events as opposed to repeatedly throughout a conflict, given that aggregated details about siren alarms are difficult to collect due to historical difficulties aggregating data and limitations on government availability due to security risk about sharing the locations of sirens. However, the limited data that is available reveals both sirens' pervasiveness and potential centrality — as mentioned earlier, Ukraine in just one year experienced *15,000* siren alarms (Soler, Vincente, and Hidalgo Pérez 2023). Moreover, while my inquiry focuses on localized mechanisms of terrorism exposure, their impact may apply more broadly, for example, in the instance a family member impacted by violence lives far away, or trauma is triggered through higher-order conditioning.

5.4 From Costs to Attitudes

Civilians could respond to exposure to these psychological triggers by changing their attitudes toward policies or toward the government's response to the terrorism episodes. From a strategic perspective, civilians are arguably most critical in that they enable a domestic political environment that is permissive toward certain war-time policies or support certain politicians. As such, these two mechanisms closely parallel Tomz, Weeks, and Yarhi Milo (2020)'s two key mechanisms through which public opinion influences international security outcomes: responsiveness and selection. Selection and responsiveness also mirror two contrasting dimensions of policy preference formation which have been prevalent in the public opinion literature: policy-specific attitude formation versus government-based attitude formation, which provide distinctive channels through which costs are imposed on states through civilians.[5]

[5] The policy-specific vs. government-specific support dimensions are similar to those analysed in Berrebi and Klor (2008), based on Kiewiet (1981) and G. B. Powell and Whitten (1993). A difference in the hypotheses is that I review government support more broadly instead of exploring partisanship specifically.

Along the policy-specific dimension, I test the policy hawk hypothesis, which would be supported if exposure to sirens increased support for intervention and opposition to negotiations, while the policy dove hypothesis, would be supported if exposure to sirens may increase support for negotiation and opposition to intervention. On the government-based attitude formation side, the rally-around-the-flag hypothesis would be supported if exposure to sirens increased approval for the national government's response, while the government punishment hypothesis would result in the opposite effect.

5.4.1 Responsiveness

On the policy side, civilians could respond to violence in three main ways. They could 1) increase support for intervention and decrease support for negotiation (policy hawk hypothesis), 2) decrease support for intervention and increase support for negotiation (policy dove hypothesis), or 3) remain neutral, uninformed, or indifferent.

Getmansky and Zeitzoff (2014) provide the most compelling psychological account of how exposure to terrorism impacts public opinion. They argue the fear from the latent threat violence, measured through the range of a rocket, explains variation in support for right-wing parties. However, they lacked data on whether these increases in rocket range were accompanied by changes in terrorism exposure. As such, a pro-intervention finding would be consistent with Getmansky and Zeitzoff's results but illustrate that influence of psychological triggers, as opposed to the latent threat of violence, is a critical mechanism driving changes in public opinion.

A policy hawk finding would also be consistent with much of the extant literature that considers material variables. Within Israel, exposure to both suicide terrorism (Berrebi and Klor 2006, 2008; Gould and Klor 2010) and rocket-based terrorism (Elster 2019) have been shown to push voters toward supporting right-wing parties. Similar effects were found in Turkey as the government countered the Kurdish PKK (Kibris 2011). The dominant explanation for this support for right-wing parties is one of issue salience, whereby right-wing parties emphasize security issues on their platforms. This increased tendency toward aggression and violence may explain the salience of hawkish attitudes in the long term. Alternatively, increased support for negotiations might manifest as fear and a related belief that negotiations are most likely to minimize violence in the long term. Theories that assume terrorism will induce negotiations and concessions, such as Pape's, implicitly rely on the assumption that terrorism will drive civilian support for negotiation (Pape 2006: 33).

Given that the direction of the responsiveness effect could theoretically increase support for either hawkish or dovish policies, the two hypotheses are outlined as follows:

- **H1:** Policy Hawk Hypothesis: as exposure to non-material forms of violence increases, so will localized support for hawkish wartime policies.

- **H2:** Policy Dove Hypothesis: as exposure to non-material forms of violence increases, so will localized support for dovish wartime policies.

5.4.3 Selection

Separately, civilians could respond by changing support for politicians, which is theoretically distinct from support for particular policies. This could hurt government support (*government punishment*) as it did in Spain, where the 2004 Madrid Train Bombings directly triggered a change in support away from the incumbent Partido Popular (PP) toward the victorious Spanish Socialist Workers' Party (PSOE) (Bali 2007; Montalvo 2011). Similar effects were also found in the Turkey/PKK case (Kibris 2011). If this explanation were to hold, approval of the incumbent leadership should decrease as individuals are exposed to violence, creating localized incumbent punishment effects. Alternatively, support for the government could temporarily increase, driving a rally-around-the-flag effect (*rally-around-the-flag hypothesis*) (see, e.g., Oneal and Bryan 1995), as President George W. Bush benefited from after 9/11 (Abramson et al. 2007). Given that the mechanism could again induce either a government punishment or rally-around-the-flag effect, the two selection hypotheses are:

- **H3:** Government Punishment Hypothesis: as exposure to non-material forms of violence increases, so will localized opposition to the country's leader.

- **H4:** Rally-Around-the-Flag Hypothesis: as exposure to non-material forms of violence increases, so will localized opposition to the country's leader.

5.4.3 Generalizability

That exposure to repeated non-material violence *results in more support for hawkish leaders* may generalize to other contexts where similar structural conditions exist. That includes countries with right-wing parties which are seen as especially competent amidst multiparty competition (Schofield and Sened 2005) and ongoing terrorist threats that create sustained exclusionary attitudes toward out-groups (Canetti-Nisim et al. 2009). However, due to the repeated nature of the attacks, the quality of Israel's air defense systems, and the sociological factors that define Israel's military-social defense culture, the Israeli case may represent a unique configuration that limits generalizability to other contexts. In most democracies, incumbent parties are punished following terrorist attacks regardless of ideology (Gelpi, Feaver, and Reifler 2006). In the election immediately following the 2004 Madrid train bombings, Spanish voters

punished the right-wing incumbent PP (Bali 2007; Montalvo 2011), though this may have been due to factors that eroded voter trust in the government. Timing generally matters: terrorist attacks that occur in the last quarter of an elected leader's term may benefit their electability, while those that fall outside that time horizon hurt incumbents (Falcó-Gimeno, Muñoz, and Pannico 2023). Moreover, terrorists in other contexts may deliberately target populations more likely to respond with dovish demands for accommodation rather than hawkish calls for retaliation (Powell 2007; Pape 2003). These cases together highlight that these findings might generalize most directly to societies under repeated sources of the threat of violence, but context-dependent variables are critical for their specific applicability.

5.5 Methodology

To empirically test my theoretical hypotheses, I rely on 1) quantitative geospatial regression to explore the relationship between siren alarms and political attitudes. I estimate the number of sirens individuals experienced during the 2014 Israel-Gaza War (Operation Protective Edge in Israel) by applying a dataset of the number of sirens that sounded each day in a given locality in Israel to survey data from the middle of the War. This new dataset allows me to exploit quasi-random variation in exposure to sirens (the treatment) to establish correlations with differences in policy attitudes toward intervention and negotiation (the dependent variable).

In political violence contexts where mass casualties and injuries are present, the effects of uncertainty and trauma have been empirically indistinguishable from the material effect of death and injury. This was largely the case for Palestinians in Gaza during the 2014 Israel-Gaza War, where a lack of missile defense infrastructure meant that many more attacks were accompanied by material damage. A UN report estimated that 1,462 Palestinian civilians, of whom 299 were women and 551 were children, were killed (United Nations General Assembly 2015: 6). Another 11,231 Palestinians were estimated to have been injured (United Nations General Assembly 2015: 7). On the Israeli side, however, the experience of exposure to rocket-based violence was different: only six civilian deaths were endured and relatively little material damage was caused despite frequent non-material exposure to terrorism. The Israeli experience reveals an empirical paradox: how can we estimate the effect of something that happens so frequently that we do not have a way of counting how often it happens?

Siren alarms, specifically within the 2014 Israel-Gaza War context, present a unique opportunity to study the effect of non-material mechanisms on the domestic politics of peace and conflict because on the Israeli side it caused relatively little material damage compared to previous conflicts. Because of its consistent frequent exposure to violence and evolving defensive counter-terrorism technology, Israel is a unique case to study the effect of political violence on attitudes. It is also precisely this combination of

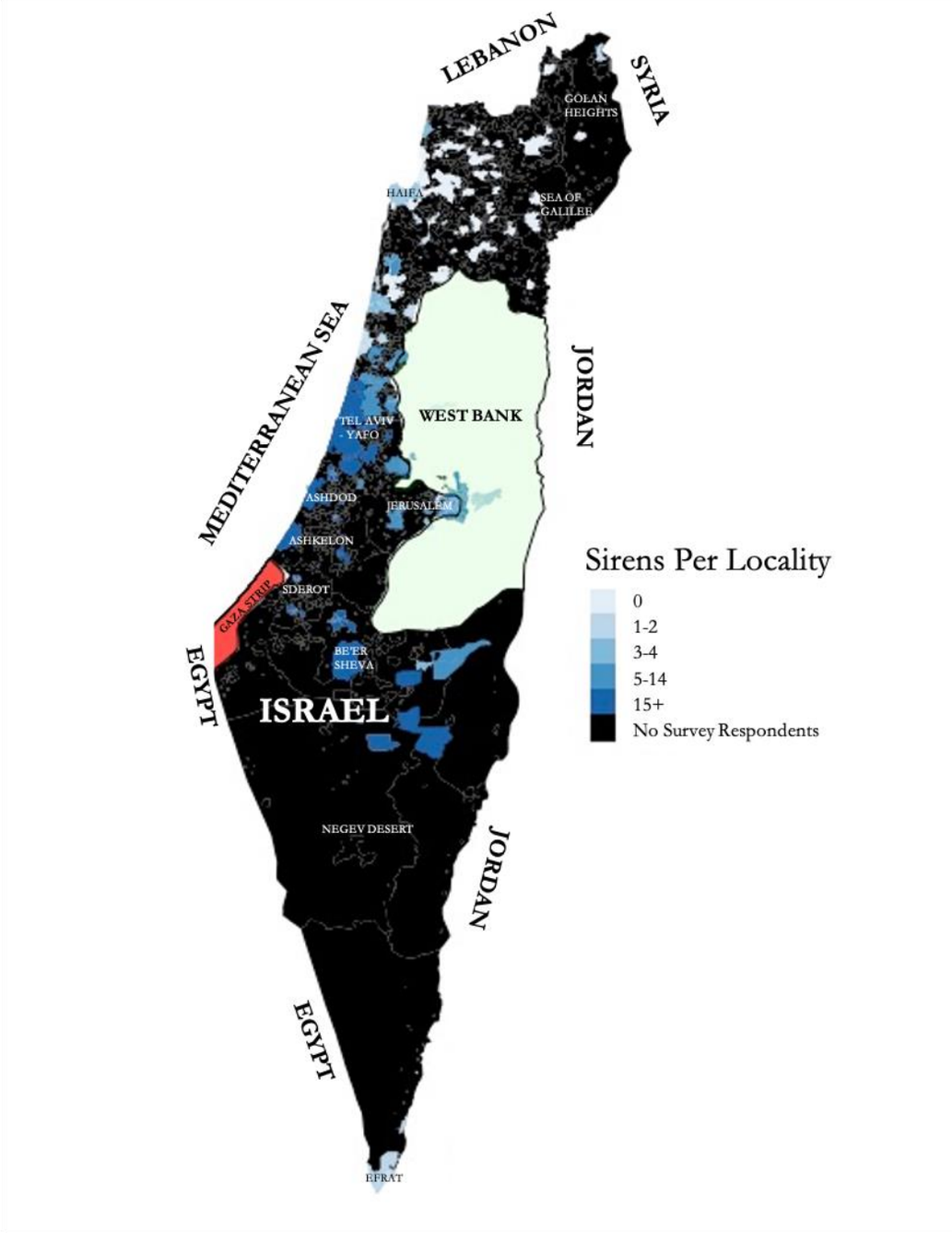
historical exposure to violence and evolving defensive capabilities that makes it an ideal empirical case, where understanding the effect of sirens on attitudes may offer lessons in jurisdictions where effects are theoretically present but less measurable.

My analysis relies on the same highly plausible assumption as Lichtman-Sadot, Benshalom-Tirosh, and Sheiner (2020) make: that the escalation in rockets on the Gaza Border, which had been quiet for the two years prior to June 2014, could not have been predicted because it was directly caused by kidnapping and killing of Israeli teenagers, Naftali Frenkel, Gilad Shaer, and Eyal Yifrah, a revenge killing of Palestinian teenager Mohammed Abu Khdeir, a highly unlikely event that served as an exogenous shock. Because the non-material mechanisms operate initially at the individual level immediately following a series of attacks, I focus my analysis on variation at the individual level (proxied through within-country variation) as opposed to a cross-national study.

Figure 5.1 illustrates the significant variation in the number of sirens respondents experienced.[6] Most of Southern Israel appears to have no respondents, which is consistent with the country's population distribution: most of this area is uninhabited desert. Moreover, the Israeli Defense Forces systematically and reliably documents the date and time of each siren, allowing me to precisely identify and at a highly disaggregated level when and how often each locality experienced a siren. My research design therefore takes advantage of this novel treatment proxy, unique case conditions, and reliable fine-grained data to these theoretical hypotheses.

[6] Many localities have more than one respondent (Tel Aviv, for example, has 53)

Figure 5.1: Geospatial Distribution of Sirens Among Survey Respondents



5.5.1 The Treatment: Siren Alarms

Leveraging data on Israel's centralized siren alarm system - which was consolidated by Lichtman-Sadot, Benshalom-Tirosh, and Sheiner (2020) for their recent paper on birth outcomes - allows me to identify precisely where and when each individual would have been psychological triggered. Until June 2019,

Israel divided its siren alarm warning areas into 255 "polygons."[7] If the Iron Dome calculated that a rocket would threaten an inhabited area, the system would trigger a blaring siren throughout the entire threatened area and simultaneously launch an intercepting missile.[8] Civilians in the polygon would consequently be alerted to the imminent threat before they knew whether the rocket would actually fall, facing a short amount of time — between 15 and 90 seconds — to run to a bomb shelter. By provoking a sub-conscious reaction to an imminent threat, these sirens operated as a distinctive form of psychological trigger.

The 2014 War was the first where Iron Dome was fully deployed and played a truly transformative role in eliminating material damage in Israel, achieving an interception rate — defined as number of rockets intercepted divided by number of rockets attempted to be intercepted[9] — of 90 percent. Figure 5.2 shows the rates of civilian injuries and casualties across the three primary Israeli operations in Gaza since Hamas took control of Gaza in 2006 — Cast Lead (2008), Pillar of Defense (2012), and Protective Edge (2014) — using the data reported in Armstrong (2018)'s empirical analysis of rocket attacks in Israel.[10] The early-warning *tzeva adom* air-raid sirens system has been in place since 2005, meaning that throughout all three conflicts, air-raid sirens were a constant occurrence while Iron Dome played an increasing role over the six years of conflict. In 2008, before Iron Dome was deployed but after the first air-raid sirens had been deployed, civilians were wounded at a rate of approximately 1 injury per 5 rockets, with 660 total rockets fired — the conflict in which Hamas was able to create the most material damage in terms of injuries and deaths per rocket. Moreover, because Israelis were unprotected from the material consequences of violence, the siren had been conditioned by associations with traumatic episodes of destruction, disruption, and death.

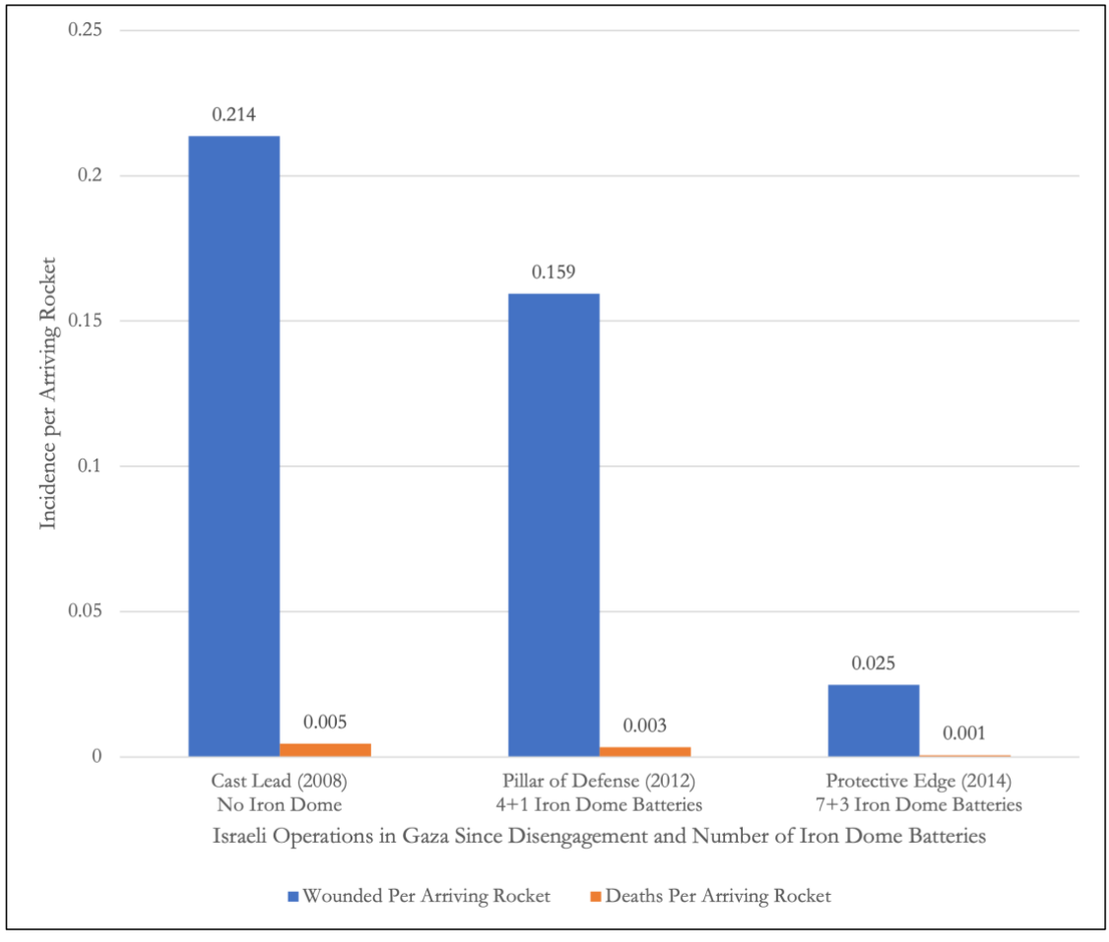
[7] The siren alarm system was upgraded in June 2019 to improve the specificity of the alerts, expanding the number of regions from 255 to approximately 1700. Alerts are now delivered to individual towns and neighborhoods instead of entire regions (Gross 2019.)

[8] In contrast, if the system calculated the rocket would fall into uninhabited land, such as in the Negev Desert, no response missile would be fired.

[9] The hit rate was even lower than the interception rate because Iron Dome only intercepts rockets that could reasonably impact civilians. If rockets that fell in the middle of the desert were included, the success rate would be higher than 90 percent.

[10] Counts of injuries and deaths according to Armstrong (2018): 118. Injury and deaths due to rockets only are included in Armstrong's count.

Figure 5.2: Change in Injuries and Deaths Rates Per Arriving Rocket Across Gaza Envelope Conflicts, 2008-2014



In 2011, Israel purchased its first Iron Dome batteries, with the earliest versions of the system in deployed during the 2012 conflict. The system was designed to detect, intercept and destroy rockets and missiles entering Israel beyond approximately four kilometers from the border (Sderot, the closest town in my dataset, was protected by Iron Dome). With partial Iron Dome deployment, this wounded-to-rocket ratio fell to about 1:6 during Pillar of Defense, although the total number of rockets fired had risen to 1506 and Hamas' rocket technology had improved. Nonetheless, material consequences were still prominent, and the creation of trauma from material damage was salient. Because Israel is such a small country, most Israelis had either experienced these material consequences of the rockets or known someone close to them — either a friend or family member — who did, further cultivating the relationship between sirens and past trauma.

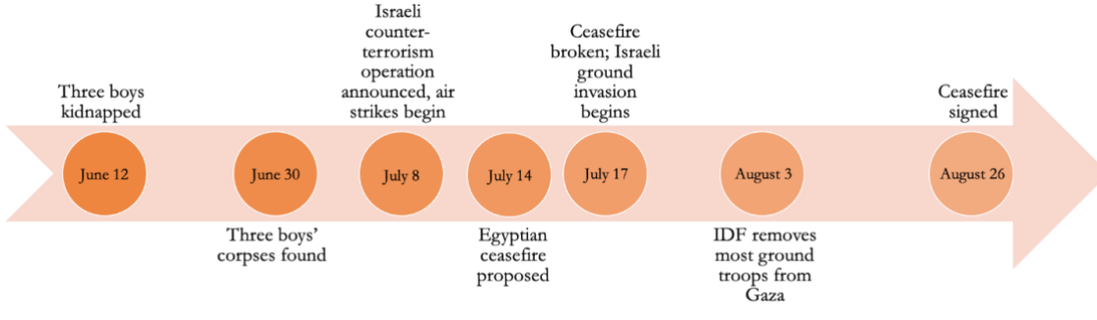
By 2014, with the Iron Dome widely implemented, civilians endured 1 injury in every 50 rockets — a ten-fold decrease compared to just six years earlier. Civilian casualty rates similarly declined from approximately 1 casualty in every 250 rockets in 2008 to 1 in every 1650 in 2014, an approximately

seven-fold improvement. The number of rockets fired, meanwhile, had more than doubled from 2014, up to 3,556 rockets, while the range of Hamas' rockets had expanded, as explained earlier. The Iron Dome thus created conditions where the number of psychological triggers was large, but the number accompanied by material injuries and deaths was small.

The inaccuracy of Hamas' rockets and the local nature of siren alarms provides another advantage in the identification of the psychological effect of sirens: the location of Hamas rockets is quasi-random.[11] Gould and Klor (2010) use a repeated panel design to rule out reverse causality for Palestinian terror attacks and public opinion from 1983 to 2006, while Elster (2019) empirically verifies the same finding for rocket-specific terrorism. Because the rockets are highly inaccurate, it is impossible for Hamas to aim at particular localities and influence civilian behavior by targeting areas that hinder their objectives. The poor accuracy of the rockets thus largely rules out the possibility of reverse causality: the political attitudes of civilians do not determine the location of rocket fire.

The conflict, which lasted 50 days, consisted of three main phases. During the first phase, which began on July 8, 2014, the IDF relied primarily on airstrikes to counter-attack Hamas and prevent further rockets from being fired. After a ceasefire was proposed by Egypt on July 14 and then broken on July 16, Israel launched its ground invasion on July 17. It was precisely at this time that the public opinion data I use in the methodology section was collected. The ground invasion phase lasted for approximately two and a half weeks, with the IDF removing most ground troops from Gaza on August 3. Multiple ceasefires were proposed throughout August, with many broken before a final ceasefire was agreed to on August 26. These events are summarized on the timeline displayed in Figure 5.3, which shows the evolution of the War beginning from the kidnapping of the three boys to the signing of the final ceasefire.

Figure 5.3: Timeline of the 2014 Israel-Gaza War



[11] This assumption has held empirically in other work on Palestinian-based terror attacks, including those involving rockets.

Specific localities experienced sirens up to 173 times during the two-month conflict, with individuals in my survey varying in the number of sirens they experienced from 0 to 106. The distribution of sirens affecting municipalities in my survey, as well as the distribution of sirens in the conflict overall, are shown in Appendix C.

5.5.2 Outcome Variable: Attitudes Toward Intervention and Negotiation

I previously presented four potential explanations for how non-material mechanisms could impact public opinion on the local level: the policy hawk, policy dove, rally-around-the-flag, and government punishment hypotheses. The policy hawk hypothesis would be supported if civilians exposed to greater number of psychological triggers preferred more interventionist policies, the policy dove hypothesis would be supported if civilians preferred more conciliatory policies, the rally-around-the-flag hypothesis would be supported if civilians felt more favorably about the national government after great exposure to triggers, and the government punishment hypothesis would be supported if civilians felt less favorably toward the national government after trigger exposures.

I operationalize the dependent variable, political attitudes, through five public opinion measures. I choose to keep each of these measurements separate, as opposed to creating an aggregate index, for two reasons. First, each of these measures are easier to interpret on their own than as an aggregate index. Second, keeping each variable separate allows us to compare differences in probabilities across each of the four measures.

The first four measures — support for a limited ground troop intervention, support for a ground troop intervention to topple Hamas, support for an immediate ceasefire, and support for negotiations with the Palestinian Authority — deal specifically with support for particular policies, selected to cover hawkish and dovish measures with shorter and longer time horizons, as Table 5.2 shows. To capture the more moderate, short-term end of the hawkish spectrum respondents were asked to what extent they agreed that "[Israel should] send in ground forces for a limited operation in coordination with continued aerial attacks until significant damage is caused to Hamas's capacities to fire rockets at Israel." They were also asked to respond to a more aggressive, long-term-oriented statement: "[Israel should] send in ground forces to reconquer Gaza and topple the Hamas government." In contrast, as a short-term pacifist solution, respondents were asked whether "[Israel should] agree again to an immediate ceasefire with the help of a third party so as to discuss the conditions for maintaining the quiet". Finally, to capture pacifist attitudes in the long term, respondents were asked "What is your position on holding negotiations for peace between Israel and the Palestinian Authority?" A positive and significant treatment effect for the intervention questions and negative and significant treatment effect would provide support for the policy

hawk hypothesis while the opposite conditions would provide support for the policy dove hypothesis. In each case, respondents were given five answer choices: 1) Do not agree at all; 2) Moderately disagree; 3) Moderately agree; 4) Strongly agree; 5) Don't know/decline to answer.

Table 5.2: Operationalization of Public Opinion Variable[12]

	Short-Term	Long-Term
Hawkish	Limited Ground Troop Intervention	Ground Troop Intervention to Topple Hamas
Dovish	Immediate Ceasefire	Negotiations with the PA

The data/questionnaires are courtesy of the Viterbi Center for Surveys at the Israeli Democracy Institute, which offer measurements of the dependent variable, political attitudes, as well as relevant individual-level control variables. Their July Peace Index survey, the primary subject of my analysis, included 705 respondents, which corresponds to a margin of error of 4 percent at the 95 percent confidence level.[13] These surveys were conducted from July 14-23, 2014, approximately one month after the first rockets were fired on Israel, with the data and time of each response noted. Importantly, because the survey was carried out by an Israeli group, the possibility of survey bias due to concerns about foreign perceptions was minimized.

5.5.3 Regression Specification

To explore the relationship between sirens and public opinion, I combined a dataset on the location of each siren alarm during summer 2014 with public opinion surveys from that same time period. The siren data was consolidated by Lichtman-Sadot, Benshalom-Tirosh, and Sheiner (2020) for their recent paper on birth outcomes.

I test these empirical hypotheses using an Ordered Logit model. The model is preferable to Ordinary Least Squares (OLS) because the outcomes are categorical and the order and direction of the responses, which increase from negative to positive, are crucial to the interpretation of the model. As a robustness check, I also consider an alternative specification using OLS to ensure the results are not dependent on the regression type.

For each of the five different measurements of the dependent variable, the model analyzed is:

$$Y_i = \beta_0 + B_1 * D_i + X_i + \varepsilon_i$$

[12] Alternative explanation: government support.
[13] Based on Israel's 2014 population size of approximately 8.216 million.

Where Y is the dependent variable, political attitudes (computed separately for each of the five public opinion indicators); D is the treatment variable, number of sirens; X is a vector of control variables outlined below, for each respondent i. The primary parameter of interest is β_1, the treatment effect. The unobserved error term is given as ε, where it is assumed the controls employed below capture sources of bias in in the model. Standard errors are clustered on the locality level to account for within-locality similarities.

5.5.4 Control Variables

The control variables I consider fall into three main categories: rocket threat variables, individual-level controls, and locality controls. I run two main multivariate regressions in addition to the bivariate model. The first regression aims to demonstrate my treatment effect parsimoniously, including only the "key variables" that I believe are theoretically most central to my analysis and pose the most important threats to identification of the treatment effect. This model includes all the rocket threat variables and a few of the most important theoretically important individual-level controls, which I describe below. A second more expansive regression considers other possible demographic factors as well as variables associated with the possibility of targeting. While I argue targeting was unlikely given the overarching strategy of indiscriminate rocket fire was designed to intimidate as much of the population as possible, and others have relied on this same highly plausible assumption to conduct their analyses, these variables account for the possibility that Hamas was able to select its targets at a broader level (such as aiming at the Tel Aviv District). While the "all controls" model accounts for more possible sources of bias, it is significantly less parsimonious. Shape files for geospatial data, as well as data on district-level controls for Israeli localities, were obtained from Israel's Central Bureau of Statistics. Shape files for the administrative boundaries of both Gaza and Lebanon were obtained from the Global Database of Political Administrative Boundaries at William & Mary's geoLab.

The rocket threat variables rule out the possibility that the threat of rockets impacted civilians in a way not captured through the siren, while district-level fixed effects account for the possibility of broad targeting. Gaza Border Distance is a continuous variable measuring the shortest distance from the Gaza Border to a given locality, serving as a proxy for level of active threat from Hamas and other terrorist organisations in Gaza. This variable is crucial for two reasons. Residents close to the Gaza border are more likely to experience rockets due to the rocket's closer range, and these residents may hold political views that are informed by their distance to the border. Second, by explicitly controlling for distance to the border, I account for the explanation provided by Getmansky and Zeitzoff (2014): fear of an attack pushes civilians to pursue right-wing policies. I include a similar variable for Lebanon Border Distance,

the shortest distance from the Lebanon Border to a given locality, designed to capture the latent threat of an attack from Hezbollah in Southern Lebanon. Finally, I use district-level fixed effects to control for the broader areas Hamas may have been targeting, like broader Tel Aviv or broader Jerusalem. While Hamas' strategy seems to have been to fire rockets randomly and indiscriminately to induce fear in and trigger as much as the Israeli population as possible, it may have been that they targeted relatively more populated areas in Israel or chose to fire in a particular direction more than others for a different reason. These district-level fixed effects account for that possibility.

The next set of variables are individual level: they are used to make sure I make 'apples-to-apples' intra-dataset comparisons. Income is a continuous variable in which respondents ranked their relative income compared the national average.[14] Because the survey includes a baseline measure of average income, income misperception effects should be mitigated compared to estimations and self-reporting without a reported average income, overcoming income misperception effects (Cruces, Perez-Truglia, and Tetaz 2013). The variable Right-Wing Vote 2013 captures whether the respondent stated voted for a right-wing party in the election the year before Operation Protective Edge.[15] Lastly, in the 'all controls' regression, I control for Religiousness, Age, Gender, and Post-High School Education — all considered in Getmansky and Zeitzoff (2014)'s analysis — but I argue these variables are unlikely to be sources of omitted variable bias (we wouldn't expect your age, for example, to be related to the number of sirens you were exposed to).

A third set of variables captures locality-level differences that might have affected where Hamas chose to fire rockets. While Hamas rockets were not sufficiently accurate to attack specific targets, it is possible that in some cases they were able to aim and eventually hit a target. I identify several criteria upon which Hamas might decide to attack a particular locality: the locality's percent Jewishness, percent that voted for right-wing parties in 2013, relative distance from Tel Aviv (measured through peripherality index), and socioeconomic status (measured through socioeconomic index).

The distributions of Jewish respondents and of the "key" controls are shown in Appendix C. Jewish respondents are disproportionately represented within the dataset, likely due to a combination of response bias (non-Jewish respondents may have been hesitant to criticize the government) and non-Jews disproportionately did not specify their locality and thus were not matched in the dataset.

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[14] Respondents answered the question: 'The average income for an Israeli household is 12000 NIS net per month (7800 NIS for an individual). Is your family income in comparison to the average: much under the average (1), a little below the average (2), average (3), a little above the average (4), and much above the average (5).' Missing values were set to the sample average; as a robustness check in Appendix D, I do not replace missing values.

[15] 34 parties ran in 2013; this variable counts the right-wing parties that ended up in the Knesset: Likud-Israel Beiteinu, Shas, HaBait HaYehudi, and Yahadut HaTorah. I replace the right-wing coalition variable with a dummy variable for whether the respondent voted for the Likud in 2013 as a robustness check in Appendix D. This data was obtained from Israel's Central Election Committee Website.

Nonetheless, non-Jewish respondents, as shown above, systematically supported pro-negotiation measures. Those excluded from the dataset for fear of challenging the Jewish majority likely would have held similar political beliefs.

There are two main drawbacks in this research design. First, I am unable to control for the limited number of injuries or property damage suffered by Israeli civilians during the 2014 War, which makes it difficult to rule out econometrically the possibility that the small amount of material violence, resulting in injuries or property damage, drove attitude changes as opposed to the sense of threat the siren triggered, rendering this study a first — though imperfect — attempt to test my theory. While the three intra-War deaths that had occurred at the time of the survey were certainly national issues, no deaths during the War specifically impacted the localities subject to this analysis.[16]

A second concern may be whether those most exposed to sirens on the Gaza border are representative of Israel's population more broadly. Individuals who feared the rockets might have fled, or these siren-affected areas may be poorer compared to Israel's urban centers. While to my knowledge there is no data delineating between immigration and emigration to particular localities, the population of Sderot grew consistently from 2008 to 2015 by approximately 1,000 people per year and real estate prices increased by approximately 60-70 percent over that time span. Many of these residents moved to take advantage of relatively inexpensive (though rising) housing prices and then take a train less than an hour to Tel Aviv, collectively providing preliminary evidence that migration effects did not fundamentally alter Sderot's population or that movement into and out of the Gaza Envelope was principally motivated by political factors. Although residents in towns most immediately in the line of fire like Sderot may have moved for political reasons — Davidi, for example, spoke of the importance of defending every inch of Jewish soil in our interview — these factors in the eyes of both Sderot and Sha'ar HaNegev's leadership were secondary to economic development. Moreover, these factors were unlikely to impact areas further from the border that still experienced dozens of sirens, like Tel Aviv. The rocket threat is so pronounced throughout Israel that migration/income effects are unlikely to affect my sample more broadly. Another concern could be that ideological selection effects drove results — those closer to the border may be more hawkish. However, siren alarms did not just influence the border towns; they influenced a much broader sample of the country, with party support controlled for within the regressions. Moreover, the political orientation of the border towns is significantly diverse — for example, 41.5 percent of the 15,000 voters in Sderot voted for Benjamin Netanyahu's Likud party (compared to 23.1 percent nationally) in Israel's 2022 national election, while 24.6 percent voted for the Religious Zionist Party

[16] Three deaths impact the time frame of the July survey. None of these civilians lived in localities included in the survey, so their deaths are not accounted for on the local level within the analysis. Three additional civilians died in August ("Memorial Day 2020 for the Fallen Soldiers and Victims of Terrorism" 2020).

(compared to 10.1 percent nationally). In the directly bordering kibbutzim in Sha'ar HaNegev (4,041 voters), only 8.1 percent of voters supported Likud and a mere 4.3 percent supported the Religious Zionist Party, underscoring the heterogeneity of party support in different geographic areas of Israel.

5.6 Results

In this sub-section, I show the results from testing my theoretical hypotheses. The first four regressions test the competing policy hawk and policy dove hypotheses. The policy hawk hypothesis would be supported if an increase in exposure to siren alarms is a significant predictor for more support for limited ground troop intervention (regression 1) and ground troop intervention to topple Hamas (2) along with lower support for an immediate ceasefire (3) and negotiations with the PA (4). The policy dove hypothesis, meanwhile, would operate in the opposite direction. The fifth regression tests the government-based hypotheses. An increase exposure to siren alarms leading to higher government satisfaction (5) would imply a rally-around-the-flag effect, while dissatisfaction for the government would point to a government punishment effect.

Table 5.3: The Effect of Siren Exposure on Public Opinion (Bivariate)

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.123**	0.085*	−0.088***	−0.110***	−0.022
	(0.055)	(0.049)	(0.027)	(0.033)	(0.044)
Observations	591	489	601	585	604

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

In the bivariate case, shown in Table 5.3, siren exposure is a significant predictor for all four policy hawk hypothesis indicators: they are positively correlated with the hawkish measures (regressions 1 and 2) and negatively correlated with the dovish measures (regressions 3 and 4). There is no significant relationship between sirens and government performance (regression 5), suggesting that neither a rally-around-the-flag nor government punishment effect occurred simultaneously as a direct result of siren exposure.[17] The presence of a hawkish policy effect without a rally-around-the-flag or government punishment effect suggests that this support for hawkish policies is not directly connected to support for the government tasked with implementing these policies. These results improve in a multivariate regression with key variables in Table 5.4, with all four policy hawk indicators increasing in magnitude and

[17] The government did, however, enjoy a nationwide rally-around-the-flag effect, with the average Israeli Jew rating government performance 7.4/10. However, this government satisfaction does not appear directly related to siren exposure (though I merely fail to reject the null hypothesis rather than determine sirens do not impact government performance).

registering as significant at the 95 percent confidence level. In the "all controls" regressions shown in Table 5.5, which incorporate the remaining demographic variables as well as locality-level controls, the results again remain unchanged, providing further support for the robustness of a policy hawk effect.

Table 5.4: The Effect of Siren Exposure on Public Opinion (Key Variables)

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.358***	0.206**	−0.227***	−0.159**	0.031
	(0.112)	(0.089)	(0.077)	(0.073)	(0.065)
Gaza Dist.	0.018	0.010	−0.017*	−0.013**	0.004
	(0.011)	(0.007)	(0.010)	(0.006)	(0.006)
Lebanon Dist.	0.008	0.006	−0.002	−0.004	0.005
	(0.008)	(0.005)	(0.008)	(0.004)	(0.005)
2013 Right-Wing Vote	0.775***	1.076***	−1.104***	−1.941***	0.346*
	(0.188)	(0.185)	(0.179)	(0.240)	(0.192)
Relative Income	0.027	−0.138*	0.022	0.132	0.066
	(0.085)	(0.079)	(0.070)	(0.084)	(0.060)
Haifa District	−0.128	0.181	1.418**	1.165**	−0.234
	(0.469)	(0.609)	(0.582)	(0.562)	(0.515)
Jerusalem District	−0.001	0.534**	0.138	−0.144	−0.476**
	(0.232)	(0.272)	(0.200)	(0.213)	(0.223)
Judea and Samaria	0.474	0.675*	0.606	−0.456	−0.659
	(0.554)	(0.380)	(0.372)	(0.339)	(0.438)
Northern District	−0.749	−0.439	1.773**	1.188*	−0.061
	(0.686)	(0.792)	(0.735)	(0.640)	(0.617)
Southern District	−0.814**	−0.600	0.162	0.038	−0.619
	(0.373)	(0.399)	(0.463)	(0.417)	(0.444)
Tel Aviv District	0.025	−0.0003	0.331	0.177	0.088
	(0.260)	(0.317)	(0.328)	(0.276)	(0.218)

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

In six of the ten 'key variables' and 'all variables' regressions, distance from the Gaza border is not significant, and in all ten regressions, distance from the Lebanon border is not significant. The insignificance of these variables reduces the chance that public opinion was formed based on a latent, omnipresent threat of terrorism as opposed to the active threat sirens provide. The non-significance of most district fixed effects provides evidence that even broad targeting of districts was unlikely to have occurred. These results collectively show a strong correlation between exposure to siren alarms and hawkish attitudes independent of distance effects, possible locality-level targeting, or possible district-level targeting.

Table 5.5: The Effect of Siren Exposure on Public Opinion (All Variables)

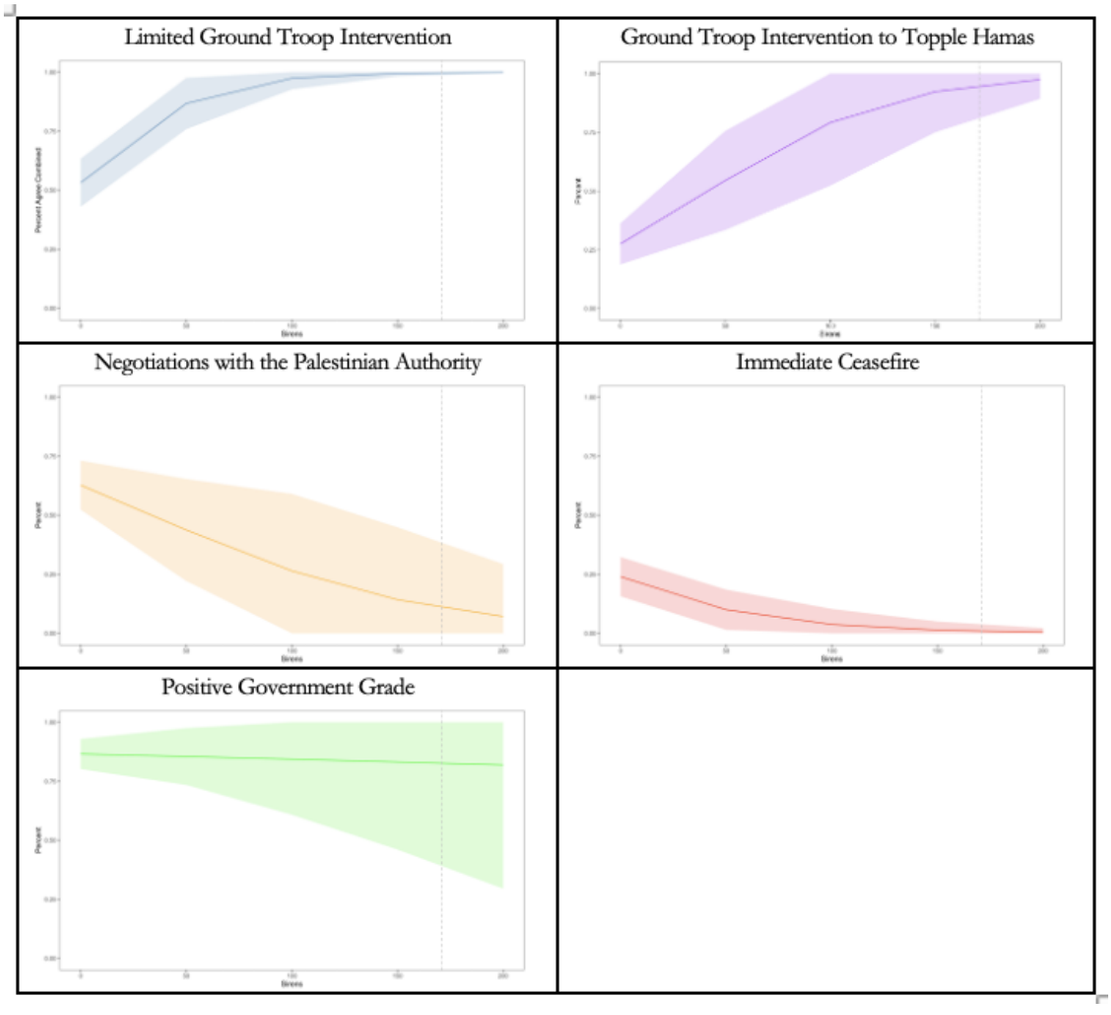
	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.330***	0.139*	−0.221***	−0.160**	0.081
	(0.105)	(0.079)	(0.060)	(0.067)	(0.093)
Since Last Rocket	−0.513	0.357	0.645**	0.196	−0.682*
	(0.437)	(0.430)	(0.320)	(0.328)	(0.365)
Gaza Dist.	0.014	0.013	−0.005	−0.009*	0.002
	(0.011)	(0.008)	(0.005)	(0.005)	(0.009)
Lebanon Dist.	0.009	0.006	0.003	−0.001	0.008
	(0.007)	(0.005)	(0.005)	(0.003)	(0.006)
2013 Right-Wing	0.721***	1.016***	−1.084***	−1.764***	0.189
	(0.220)	(0.209)	(0.199)	(0.222)	(0.207)
Observations	403	400	408	397	410
Demographic Controls	X	X	X	X	X
Locality-Level Controls	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

An especially useful way of concretely understanding the effect of sirens on support for these various policies is to measure the probability that a representative individual will support a given policy based on the number of sirens they experienced. By calculating different probabilities based on different numbers of siren exposures, predicted probabilities therefore allow for easy comparisons and generalizations to be made across different levels of siren exposure and cases based on an abstract "average case."

Figure 7 illustrates how support for each of the five indicators changes as the number of sirens experienced increases. The first row shows the two pro-intervention indicators, the second row shows the two pro-negotiation indicators, and the third row shows the government grade indicator from the politics hypothesis. If the policy hawk hypothesis holds, an increase in the number of sirens should be associated with an increase in the first row, a decrease in the second row, and a flat line in the third row. For ease of interpretation, I use a binomial logit model that combines 'Slightly Agree' and 'Strongly Agree' into a combined 'Agree' response and 'Slightly Disagree' and 'Strongly Disagree' into a combined 'Disagree' response. The y-axis represents the predicted probability that an individual will either slightly agree or strongly agree with a given statement.

Figure 5.4: Predicted Political Attitudes for the Average Israeli Jewish Citizen



Each of the predicted patterns hold and the results are consistent with the policy hawk hypothesis, with the first row upward sloping, the second row downward sloping, and the third row flat. At 0 sirens, there is a 57 percent chance an average Israeli would have supported a limited ground troop intervention, 31 percent chance for a ground troop intervention to topple Hamas, 36 percent for an immediate ceasefire, and 67 percent for PA negotiations. After even 50 sirens, however, these probabilities change dramatically: the probability that an average Israeli would have supported a limited ground troop intervention jumps to 89 (+32%) percent while support for a ground troop intervention to topple Hamas increased to 56 (+25%) percent. Predicted support for an immediate ceasefire fell to 15 percent (-21%) while support for PA negotiations decreased to 47 percent (-20%). At 171 sirens, the maximum number of sirens experienced on the final day of the survey in Yad Mordechai, individuals were more than 95 percent likely to support a limited ground troop negotiation and oppose a ceasefire. In contrast, exposure to additional sirens has limited impact on government satisfaction, with an additional 50 sirens increase positive government satisfaction from 85 percent to 87 percent (+2%).

Collectively, these regressions and predicted probabilities provide evidence of a strong correlation between exposure to sirens and hawkish policy attitudes but are on their own insufficient to establish causality. As remarked in the research design sub-section, without data on material damage, for example, it is difficult to rule out, for example, the possibility that material damage — however limited — did play a role in this correlation. However, evidence from interviews (detailed further later), as well as other studies during Operation Protective Edge and previous Gaza operations, suggest sirens play a causal role in influencing civilian attitudes. Moreover, the secondary literature establishes clearly that sirens impact individuals both biologically and psychologically: from a biological perspective, Lichtman-Sadot, Benshalom-Tirosh, and Sheiner (2020) find exposure to sirens during Operation Protective Edge caused lower birth weights and shorter gestational periods. Elster, Zussman, and Zussman (2019), meanwhile, find that periods of rocket fire on the Gaza Border resulted in increases in anti-anxiety medication purchases.

These results held consistently when the data was subset based on distance and 2013 voting preferences (full regressions shown in Appendix C). The effect of non-material mechanisms appeared to be stronger after the ground troop intervention began than before, suggesting that local support may have increased as a result of approval for the operation itself. These results also held regardless of whether the locality was located closer to the border (< 40 km) or farther (> 40 km). Moreover, the results also hold regardless of whether the respondent voted for a party in the right-wing coalition or not.[18] It is particularly interesting that civilians who voted against the right-wing coalition and who were exposed to more sirens also tended to respond with more hawkish preferences, going against their previous voting tendencies. While the number of observations is relatively small in some cases, particularly for localities close to the border, these subsets provide useful preliminary insights into the generalizability of the importance of non-material mechanisms.

Additional robustness checks, shown in Appendix C, were performed based on the regression type (running an OLS regression) and alternative specifications of the siren variable: as both a log of the original sirens variable, to take into account of diminishing returns to sensitivity to sirens as exposure increases, and as a binary variable, counting the number of total days in which sirens were experienced. Across both the logged sirens and number of days with sirens designations, the policy hawk indicators are all significant, while the government performance indicator is never significant, reaffirming support for my findings.

[18] The exception was the negotiations variable was not significant for localities far from the border or for right-wing voters, though the negative sign was consistent with previous findings.

5.7 Conclusion

Non-material mechanisms, and specifically uncertainty and trauma, are not simply by-products of terrorist activity: they are central both to imposing costs and to terrorism's broader strategic logic and demand different counter-terrorism policy solutions. These non-material mechanisms can occur without material damage and at a far greater rate than material mechanisms, so much so they that are exceedingly difficult to measure in the real world. They are financially prudent for weak actors, largely avoid the negative external public opinion effects of material violence, and may be ignored During the 2014 Israel-Gaza War, exposure to siren alarms, an example of one of these non-material factors that were largely unaccompanied by material damage, was a significant predictor of Israeli support for intervention and opposition to negotiations, potentially reflecting both the costliness and consequences of the triggering.

My paper makes several important contributions. In disaggregating the concept of terrorism exposure, my paper makes an important contribution to our understanding of terrorism's strategic logic. Building on the psychology of terrorism literature, I challenge the literature's widespread assumption that material damage is conceptually inclusive of non-material mechanisms and provide novel alternative explanations. These distinctive theoretical explanations should inform policy decisions on counter-terrorism resource allocation. From an empirical perspective, sirens are not just a ubiquitous form of psychological trigger within political violence contexts, but they also represent a unique form of data in that they are both highly disaggregated and publicly available. Normally such disaggregated data is either unavailable to researchers or is available only on the condition that the data remain confidential. My novel application of sirens within a political science research design can be readily extended to further studies of not just Israel but also Ukraine. This methodological foundation makes conducting research on the consequences of terrorism contexts feasible across a range of contexts.

Finally, my research provides insights into how terrorists can maximize their negotiation leverage given financial and political constraints. My non-material mechanisms have likely allowed terrorists to benefit from the costliness associated with attrition strategies while limiting political alienation from third parties due to civilian deaths. Triggering trauma can also provoke disproportionate responses from states can create perceptions of imbalance in the degree of violence employed by terrorists and governments. In all these ways, creating psychological, non-material costs may be preferable to the terrorist than actually creating material violence. Understanding how terrorists can optimize their outcomes given constraints is essential to combating terrorism and reducing its effectiveness.

This paper provides several avenues for further research. First, lab-based experiments will allow for further isolation of the mechanism driving changes in public attitudes, using the conceptual framework I provide as a starting point for theory testing. Second, future research should expand the use of sirens-

based designs to explore variables beyond attitudes toward violence. Use of siren data from other contexts such as Ukraine allow for cross-country comparisons and the exploration of the generalizability of my mechanisms. Third, research should explore the extent to which terrorists have intentionally exploited non-material mechanisms or if these mechanisms reflect attacks that failed to create material damage, allowing a move from evaluation of the consequences of behavior to a claim about intentions. New siren alarm data in Ukraine makes cross-country sirens case comparisons possible, but future scholarship should be equally concerned with identifying other measurement strategies for non-material mechanisms and estimate their frequency. Fourth, research should explore how policymakers consider the costs of conflict and the extent to which non-material consequences are considered in developing counter-terrorism strategy. Finally, researchers should consider how advances in the quality and accessibility of defense technology will impact the relative importance of non-material mechanisms. If technological advances favor defense, Israel and other countries relying on advanced anti-missile defense technologies should take these longer-term technological changes into account as they build their counter-terrorism strategies.

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Appendix A: July 2014 Peace Index Survey

The Peace Index — July 2014

This questionnaire was asked in July 2014 three times. This is the first time and was held on 14/7/2014.

1. ID
2. County
    a. South
    b. Haifa
    c. Judea and Samaria
    d. Jerusalem
    e. Centre
    f. North
    g. Tel Aviv
3. Sex
    a. Male
    b. Female
4. Age group
    a. 18-24
    b. 25-34
    c. 35-44
    d. 45-54
    e. 65+
5. Age
6. (Jews only) How do you define yourself religiously
    a. Orthodox-Haredi
    b. Religious
    c. Traditional Religious
    d. Traditional not so religious
    e. Not religious, Secular
7. What is your position on holding negotiations for peace between Israel and the Palestinian Authority?
    a. Very for it
    b. Somewhat for it
    c. Somewhat against it

d. Very against it
e. Do not know

8. Do you believe or not believe that negotiations between Israel and the Palestinian Authority will lead in the coming years to peace between Israel and the Palestinian Authority?
   a. Strongly believe
   b. Moderately believe
   c. Moderately do not believe
   d. Do not believe at all
   e. Don't know/decline to answer

9. In your opinion, was the launching of Operation Protective Edge justified or not justified?
   a. Completely justified
   b. Moderately justified
   c. Moderately not justified
   d. Not justified at all
   e. Don't know/decline to answer

10. In your opinion is the use the IDF has made so far of its firepower in Gaza at an appropriate level, excessive, or insufficient
   a. At an appropriate level
   b. Too much firepower
   c. Too little firepower
   d. Don/t know/decline to answer

11. (The interviewee is required to give a score for each of the following factors regarding their functioning in Operation "Protective Edge") (1 - very poor 10 — very good)
   a. What grade would you give to the functioning of the government in running Operation "Protective Edge" so far?
   b. What grade would you give to the Home Front Command for its performance in managing the defense of the home front so far?
   c. In general, what grade would you give to the functioning of the local authorities during the operation so far?
   d. What grade would you give to the Jewish population in Israel for its behavior since the operation began?
   e. What grade would you give to the Arab population in Isarel for its behavior since the operation began?

12. In your opinion, what should Israel do now? To what extent do you agree or disagree with any of the following? (Strongly Agree/Moderately Agree/Moderately Disagree/Don't know/decline to answer)

a. Stop the fighting against Hamas unilaterally for up to 48 hours and if the rocket fire does not stop, continue the operation
b. Agree again to an immediate ceasefire with the help of a third party so as to discuss the conditions for maintain the quiet
c. Agree to a ceasefire only after an agreement on the conditions for sustaining the quiet is reached via a third party
d. Continue only with the aerial attacks until significant damage is caused to Hamas's capacities to fire rockets at Israel
e. Send in ground troops for a limited operation in coordination with continued aerial attacks until significant damage is caused to Hamas's capacities to fire rockets at Israel
f. Topple Hamas

13. In your opinion, what will be the outcome of Operation Protective Edge once it has ended?
    a. Long-term quiet like the quiet that was achieved on the northern border with UN mediate in 2006
    b. There will be a further round against Hamas after a period of ___
    c. Don't know

14. Would you define yourself in terms of diplomacy & security as:
    a. Right
    b. Moderate right
    c. Centre
    d. Moderate left
    e. Left

15. Scale of 1-5 of socioeconomic principles, 1 means the state intervenes a lot in socioeconomic issues (social democracy) & 5 means the state does not intervene at all with a free market (capitalism), where would you position the best system?
    a. Social democracy
    b. 2
    c. 3
    d. 4
    e. Capitalism

16. In the elections one year ago, which party have you voted for?

17. The average income for an Israeli household is 12000 NIS net per month (7800 for an individual). Is your family income in comparison to the average:
    a. Much under the average
    b. A little under the average
    c. Average

d. A little above the average
e. Much above the average
f. Do not know/refuses

18. Education
    a. Junior high or less
    b. High school without Bagrut
    c. Full high school with Bagrut
    d. Post high school — teaching, nursing, engineering
    e. Academic degree BA
    f. Academic degree — MA or higher
    g. Yeshiva
    h. Other
    i. Refuses

19. Country of birth
    a. Israel
    b. Europe-America
    c. Asia-Africa
    d. Other (open

20. Year of immigration to Israel
    a. Before 1990
    b. 1990 and on

21. Where was your father born?
    a. Israel
    b. Europe-American
    c. Asia-Africa
    d. Other (open)

22. What is your family situation?
    a. Single; does not live with partner
    b. Married; lives with partner
    c. Divorced, separated, widow
    d. Refuses

23. Town of residence

24. Date

Appendix B: Participation Consent Form

Scott Singer
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PARTICIPANT CONSENT FORM

Central University Research Ethics Committee (CUREC)

Siren Alarms and Voting – A Study of the Gaza Envelope

Purpose of Study: The purpose of this study is to understand how rocket attacks on the Gaza Border – both successful and unsuccessful – influence voting behavior in different communities. The project focuses specifically on *tzeva adom* alarms and counter-terrorism efforts to understand the effect of rocket attacks on Israel's democratic processes. Data collected from this interview will be used exclusively for a graduate thesis, and with permission, a consequent publication.

		Please initial each box
1	I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	
2	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without any adverse consequences or penalty.	
3	I understand that research data collected during the study may be looked at by authorised people outside the research team. I give permission for these individuals to access my data.	
4	I understand that this project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee.	
5	I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project.	
6	I understand how this research will be written up and published.	
7	I understand how to raise a concern or make a complaint.	
8	I consent to being audio recorded for the purpose of transcribing the interview.	
9a	I agree to the use of direct quotes, attributed to my name, in research outputs **OR**	
9b	I agree to the use of pseudonymised quotes in research outputs **OR**	
9c	I agree to the use of anonymised quotes in research outputs **OR**	

Appendix C: Robustness Checks

Date of Survey Collection

Table 5.C1: Pre-Ground Troop Intervention (July 14 Only)

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.372**	0.080	−0.073	−0.155	0.141
	(0.161)	(0.093)	(0.152)	(0.178)	(0.146)
Lebanon Dist.	0.034**	0.010	−0.036**	−0.028	0.021
	(0.016)	(0.017)	(0.018)	(0.017)	(0.015)
Gaza Dist.	0.026**	0.012	−0.024	−0.021	0.028**
	(0.012)	(0.009)	(0.015)	(0.014)	(0.012)
2013 Right-Wing Vote	0.771**	0.986***	−0.986***	−1.922***	0.646**
	(0.300)	(0.359)	(0.327)	(0.456)	(0.273)
Relative Income	−0.019	−0.251	0.020	0.329**	0.099
	(0.129)	(0.157)	(0.134)	(0.139)	(0.109)
Observations	185	180	182	181	184
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Table 5.C2: Post-Ground Troop Intervention (July 23 Only)

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.607***	0.519***	−0.600***	−0.096	0.057
	(0.163)	(0.188)	(0.162)	(0.103)	(0.185)
Gaza Dist.	0.043**	0.039**	−0.044***	−0.005	0.018
	(0.019)	(0.018)	(0.017)	(0.017)	(0.019)
Lebanon Dist.	0.007	0.021*	−0.011	−0.002	0.010
	(0.014)	(0.013)	(0.013)	(0.011)	(0.016)
2013 Right-Wing Vote	0.947***	1.049***	−1.056***	−2.297***	−0.021
	(0.348)	(0.335)	(0.298)	(0.365)	(0.305)
Relative Income	−0.061	−0.119	0.185	0.042	−0.032
	(0.156)	(0.132)	(0.130)	(0.150)	(0.114)
Observations	172	175	178	170	176
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Distance from Border

Table 5.C3: Localities Close to the Border (< 40 km)

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.360***	0.285***	−0.255***	−0.156*	0.012
	(0.085)	(0.061)	(0.053)	(0.081)	(0.070)
Gaza Dist.	0.080**	0.111***	−0.053**	0.001	0.007
	(0.034)	(0.025)	(0.021)	(0.028)	(0.012)
Lebanon Dist.	0.017	0.014**	−0.012	−0.011	0.011*
	(0.010)	(0.005)	(0.009)	(0.008)	(0.006)
2013 Right-Wing Vote	1.984***	0.749	−0.659	−1.036*	−0.137
	(0.646)	(0.496)	(0.404)	(0.522)	(0.366)
Relative Income	−0.168	−0.157	−0.124	0.044	0.105
	(0.209)	(0.256)	(0.201)	(0.211)	(0.163)
Observations	64	63	63	62	65
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Table 5.C4: Localities Far from the Border (> 40 km)

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.978***	0.563***	−0.294*	−0.257	0.165
	(0.229)	(0.214)	(0.154)	(0.192)	(0.162)
Gaza Dist.	0.014**	0.006	−0.015**	−0.011*	0.006
	(0.007)	(0.010)	(0.007)	(0.006)	(0.008)
Lebanon Dist.	−0.006	−0.005	0.004	0.002	0.004
	(0.005)	(0.008)	(0.006)	(0.004)	(0.007)
2013 Right-Wing Vote	0.614***	1.142***	−1.189***	−2.081***	0.418**
	(0.191)	(0.197)	(0.196)	(0.249)	(0.208)
Relative Income	0.088	−0.127	0.045	0.161*	0.051
	(0.104)	(0.084)	(0.076)	(0.090)	(0.066)
Observations	420	418	427	414	427
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Voting History

Table 5.C5: Right-Wing Voters Only

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.366**	0.197**	−0.136**	−0.100	−0.031
	(0.172)	(0.090)	(0.062)	(0.084)	(0.087)
Gaza Dist.	0.020**	0.016	−0.010	−0.018*	0.002
	(0.008)	(0.010)	(0.008)	(0.010)	(0.014)
Lebanon Dist.	0.014***	0.016***	−0.006	−0.014***	0.002
	(0.005)	(0.006)	(0.006)	(0.005)	(0.009)
Relative Income	−0.011	−0.137	−0.022	0.131	0.140*
	(0.112)	(0.097)	(0.084)	(0.101)	(0.078)
Observations	278	273	278	267	280
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Table 5.C6: Non-Right-Wing Voters Only

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.477***	0.323**	−0.343**	−0.346***	0.109
	(0.147)	(0.126)	(0.135)	(0.114)	(0.106)
Gaza Dist.	0.024***	0.004	−0.023*	−0.015**	0.004
	(0.008)	(0.010)	(0.013)	(0.007)	(0.005)
Lebanon Dist.	−0.001	−0.009	0.006	0.003	0.009**
	(0.005)	(0.008)	(0.012)	(0.004)	(0.004)
Relative Income	0.118	−0.138	0.089	0.197	−0.053
	(0.146)	(0.140)	(0.106)	(0.125)	(0.118)
Observations	206	208	212	209	212
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

OLS

Table 5.C7: OLS Regression Specification

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.199***	0.118***	−0.098***	−0.086***	0.039
	(0.052)	(0.045)	(0.032)	(0.032)	(0.092)
Gaza Dist.	0.010***	0.005	−0.008***	−0.006**	0.005
	(0.003)	(0.003)	(0.003)	(0.003)	(0.009)
Lebanon Dist.	0.003	0.004	−0.0002	−0.002	0.009
	(0.002)	(0.002)	(0.002)	(0.002)	(0.006)
2013 Right-Wing Vote	0.471***	0.669***	−0.606***	−0.981***	0.338
	(0.113)	(0.106)	(0.100)	(0.109)	(0.274)
Relative Income	0.010	−0.080*	0.012	0.066	0.073
	(0.048)	(0.043)	(0.038)	(0.041)	(0.078)
Constant	1.247***	1.085**	2.782***	3.575***	5.984***
	(0.425)	(0.423)	(0.411)	(0.294)	(1.171)
Observations	484	481	490	476	492
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Explanatory Variable Specification

Table 5.C8: Logged Sirens Variable

	Positive Reaction Toward				
	Limited Ground Troops	Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.738***	0.587***	−0.250**	−0.242*	0.033
	(0.129)	(0.156)	(0.124)	(0.147)	(0.126)
Gaza Dist.	0.026***	0.019**	−0.016**	−0.014**	0.004
	(0.009)	(0.008)	(0.007)	(0.007)	(0.007)
Lebanon Dist.	0.005	0.004	0.001	−0.002	0.005
	(0.006)	(0.005)	(0.005)	(0.003)	(0.005)
2013 Right-Wing Vote	0.787***	1.105***	−1.096***	−1.941***	0.345*
	(0.189)	(0.182)	(0.177)	(0.240)	(0.193)
Relative Income	0.028	−0.145*	0.024	0.132	0.066
	(0.089)	(0.082)	(0.069)	(0.083)	(0.060)
Observations	484	481	490	476	492
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Table 5.C9: Days of Sirens Experienced Variable

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.177***	0.113***	−0.064**	−0.067**	0.024
	(0.039)	(0.039)	(0.029)	(0.033)	(0.028)
Gaza Dist.	0.022**	0.013*	−0.015**	−0.014**	0.005
	(0.009)	(0.007)	(0.007)	(0.006)	(0.006)
Lebanon Dist.	0.005	0.004	0.001	−0.003	0.005
	(0.006)	(0.005)	(0.006)	(0.003)	(0.005)
2013 Right-Wing Vote	0.751***	1.057***	−1.079***	−1.925***	0.345*
	(0.189)	(0.185)	(0.176)	(0.239)	(0.188)
Relative Income	0.028	−0.143*	0.024	0.135	0.066
	(0.087)	(0.080)	(0.070)	(0.085)	(0.060)
Observations	484	481	490	476	492
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Regional

Table 5.C10: Exclude Jerusalem District Robustness Check

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.357***	0.204**	−0.224***	−0.158**	0.037
	(0.113)	(0.087)	(0.076)	(0.076)	(0.065)
Gaza Dist.	0.019	0.010	−0.017*	−0.013**	0.004
	(0.012)	(0.007)	(0.009)	(0.007)	(0.006)
Lebanon Dist.	0.009	0.006	−0.001	−0.004	0.005
	(0.009)	(0.005)	(0.008)	(0.004)	(0.005)
2013 Right-Wing Vote	0.770***	0.972***	−1.095***	−1.768***	0.480***
	(0.197)	(0.194)	(0.192)	(0.218)	(0.185)
Relative Income	0.058	−0.162*	0.041	0.173**	0.087
	(0.087)	(0.084)	(0.073)	(0.086)	(0.065)
Observations	444	441	450	437	452
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Table 5.C11: Exclude Tel Aviv District Robustness Check

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.357***	0.204**	−0.224***	−0.158**	0.037
	(0.113)	(0.087)	(0.076)	(0.076)	(0.065)
Gaza Dist.	0.019	0.010	−0.017*	−0.013**	0.004
	(0.012)	(0.007)	(0.009)	(0.007)	(0.006)
Lebanon Dist.	0.009	0.006	−0.001	−0.004	0.005
	(0.009)	(0.005)	(0.008)	(0.004)	(0.005)
2013 Right-Wing Vote	0.770***	0.972***	−1.095***	−1.768***	0.480***
	(0.197)	(0.194)	(0.192)	(0.218)	(0.185)
Relative Income	0.058	−0.162*	0.041	0.173**	0.087
	(0.087)	(0.084)	(0.073)	(0.086)	(0.065)
Observations	444	441	450	437	452
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Table 5.C12: Exclude Central District Robustness Check

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.284***	0.191**	−0.154**	−0.159**	0.022
	(0.100)	(0.093)	(0.076)	(0.079)	(0.067)
Gaza Dist.	0.014	0.011	−0.018**	−0.020***	−0.002
	(0.009)	(0.008)	(0.007)	(0.007)	(0.007)
Lebanon Dist.	0.007	0.005	0.004	0.0003	0.009
	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)
2013 Right-Wing Vote	0.914***	0.978***	−1.068***	−1.850***	0.318
	(0.243)	(0.227)	(0.229)	(0.326)	(0.227)
Relative Income	−0.018	−0.149	0.002	0.123	0.015
	(0.101)	(0.095)	(0.080)	(0.097)	(0.063)
Observations	345	344	349	337	350
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Table 5.C13: Exclude Southern District Robustness Check

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.905***	0.504**	−0.363**	−0.212	0.232*
	(0.207)	(0.206)	(0.147)	(0.181)	(0.132)
Gaza Dist.	0.020	−0.031	−0.041**	−0.009	0.056***
	(0.021)	(0.020)	(0.017)	(0.018)	(0.019)
Lebanon Dist.	0.001	−0.037**	−0.021	0.002	0.050***
	(0.018)	(0.017)	(0.016)	(0.015)	(0.017)
2013 Right-Wing Vote	0.666***	1.174***	−1.204***	−2.039***	0.409**
	(0.194)	(0.192)	(0.193)	(0.248)	(0.205)
Relative Income	0.064	−0.176**	0.071	0.175*	0.095
	(0.101)	(0.086)	(0.074)	(0.092)	(0.071)
Observations	414	412	420	410	421
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Table 5.C14: Exclude Haifa District Robustness Check

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.355***	0.197**	−0.223***	−0.146**	0.034
	(0.112)	(0.090)	(0.075)	(0.073)	(0.067)
Gaza Dist.	0.018	0.008	−0.014	−0.009	0.005
	(0.012)	(0.008)	(0.009)	(0.006)	(0.007)
Lebanon Dist.	0.009	0.007	−0.003	−0.007*	0.005
	(0.008)	(0.005)	(0.007)	(0.004)	(0.005)
2013 Right-Wing Vote	0.788***	1.245***	−1.139***	−2.082***	0.360*
	(0.194)	(0.198)	(0.191)	(0.256)	(0.202)
Relative Income	0.020	−0.091	0.010	0.104	0.126*
	(0.098)	(0.086)	(0.078)	(0.085)	(0.065)
Observations	426	422	430	418	434
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Table 5.C15: Exclude Judea and Samaria Robustness Check

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.359***	0.202**	−0.228***	−0.156**	0.031
	(0.111)	(0.088)	(0.080)	(0.072)	(0.065)
Gaza Dist.	0.019*	0.009	−0.017	−0.013**	0.004
	(0.011)	(0.007)	(0.011)	(0.006)	(0.006)
Lebanon Dist.	0.007	0.006	−0.004	−0.004	0.005
	(0.008)	(0.005)	(0.009)	(0.004)	(0.005)
2013 Right-Wing Vote	0.813***	1.043***	−1.098***	−1.913***	0.344*
	(0.191)	(0.184)	(0.180)	(0.242)	(0.194)
Relative Income	0.022	−0.159**	0.018	0.132	0.060
	(0.085)	(0.079)	(0.072)	(0.085)	(0.062)
Observations	464	461	470	457	472
District FE	X	X	X	X	X

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Control Variable Specification

Table 5.C16: Don't Replace "Relative Income" Missing Values Robustness Check

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.352***	0.189**	−0.187**	−0.129*	0.056
	(0.120)	(0.081)	(0.073)	(0.077)	(0.071)
Gaza Dist.	0.016*	0.008	−0.016*	−0.013*	0.006
	(0.010)	(0.007)	(0.009)	(0.007)	(0.007)
Lebanon Dist.	0.007	0.007	−0.001	−0.004	0.006
	(0.007)	(0.005)	(0.008)	(0.004)	(0.006)
2013 Right-Wing Vote	0.678***	1.001***	−1.120***	−1.999***	0.293
	(0.197)	(0.188)	(0.185)	(0.238)	(0.201)
Relative Income	0.010	−0.146*	0.027	0.133	0.064
	(0.084)	(0.078)	(0.072)	(0.087)	(0.063)
Haifa District	−0.082	0.339	1.299**	0.977	−0.499
	(0.453)	(0.624)	(0.586)	(0.672)	(0.550)
Jerusalem District	−0.074	0.476*	0.234	−0.057	−0.544**
	(0.247)	(0.283)	(0.226)	(0.225)	(0.233)
Judea and Samaria	0.373	0.691*	0.730*	−0.340	−0.496
	(0.547)	(0.405)	(0.376)	(0.367)	(0.450)
Northern District	−0.752	−0.323	1.796**	1.249*	−0.085
	(0.656)	(0.806)	(0.739)	(0.718)	(0.653)
Southern District	−0.821**	−0.778*	0.170	0.039	−0.790
	(0.372)	(0.414)	(0.457)	(0.454)	(0.495)
Tel Aviv District	−0.013	−0.056	0.371	0.155	0.090
	(0.263)	(0.344)	(0.321)	(0.253)	(0.229)
Observations	444	441	449	437	452

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Table 5.C17: Replace "Right-Wing" with "Likud" Robustness Check

	Positive Reaction Toward				
	Limited Ground Troops	Ground Troops to Topple Hamas	Immediate Ceasefire	Negotiations with the PA	Government Performance
	(1)	(2)	(3)	(4)	(5)
Sirens (per 10)	0.339***	0.208**	−0.206***	−0.129	0.019
	(0.111)	(0.090)	(0.077)	(0.082)	(0.063)
Gaza Dist.	0.018	0.010	−0.015	−0.009	0.004
	(0.013)	(0.008)	(0.009)	(0.007)	(0.006)
Lebanon Dist.	0.009	0.006	−0.002	−0.004	0.005
	(0.009)	(0.005)	(0.008)	(0.004)	(0.005)
2013 Likud Vote	0.314*	0.261	−0.479***	−0.576***	0.653***
	(0.170)	(0.189)	(0.173)	(0.178)	(0.155)
Relative Income	−0.024	−0.202**	0.080	0.243***	0.069
	(0.082)	(0.080)	(0.073)	(0.080)	(0.061)
Haifa District	−0.256	−0.035	1.427***	1.165**	−0.254
	(0.468)	(0.607)	(0.505)	(0.538)	(0.538)
Jerusalem District	0.080	0.584**	0.054	−0.289	−0.424**
	(0.250)	(0.296)	(0.204)	(0.255)	(0.212)
Judea and Samaria	0.689	0.946**	0.258	−0.892**	−0.563
	(0.530)	(0.384)	(0.400)	(0.384)	(0.447)
Northern District	−0.773	−0.487	1.643**	0.948	−0.096
	(0.678)	(0.814)	(0.652)	(0.640)	(0.651)
Southern District	−0.747*	−0.484	0.108	−0.013	−0.713
	(0.410)	(0.397)	(0.449)	(0.425)	(0.435)
Tel Aviv District	−0.029	−0.105	0.425	0.377	0.111
	(0.292)	(0.329)	(0.370)	(0.354)	(0.211)
Observations	486	483	492	478	494

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the locality level.

Table 5.C18: Distribution of Respondents by Locality[19]

Locality	Number of Respondents	Number of Sirens on July 24
Tel Aviv – Yafo	53	22
Jerusalem	47	5
Petah Tikvah	39	16
Haifa	29	3
Ashdod	22	83
Rishon LeZion	19	40
Be'er Sheva	18	75
Ashkelon	16	112
Rehovot	16	41
Holon	15	27
Ramat Gan	14	25
Bat Yam	13	28
Herzliya	13	18
Bnei Brak	12	23
Hadera	12	3
Netanya	12	2
Nazareth	10	0
All Others	349	N/A

[19] Purpose of table is to show distribution of survey respondents and siren exposure. There was more significant variation in more rural areas.

Figure 5.C1: Distribution of Sirens Experienced by Survey Respondents

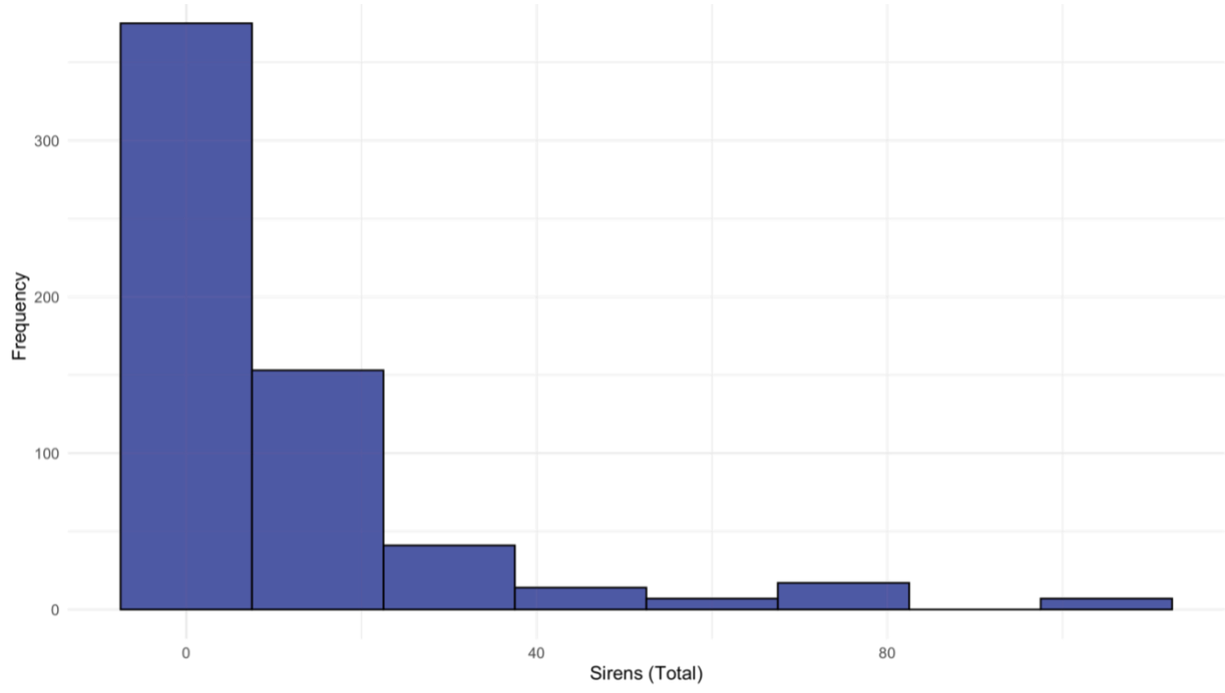


Figure 5.C2: Distribution of Sirens Experienced by Survey Respondents (Logged)

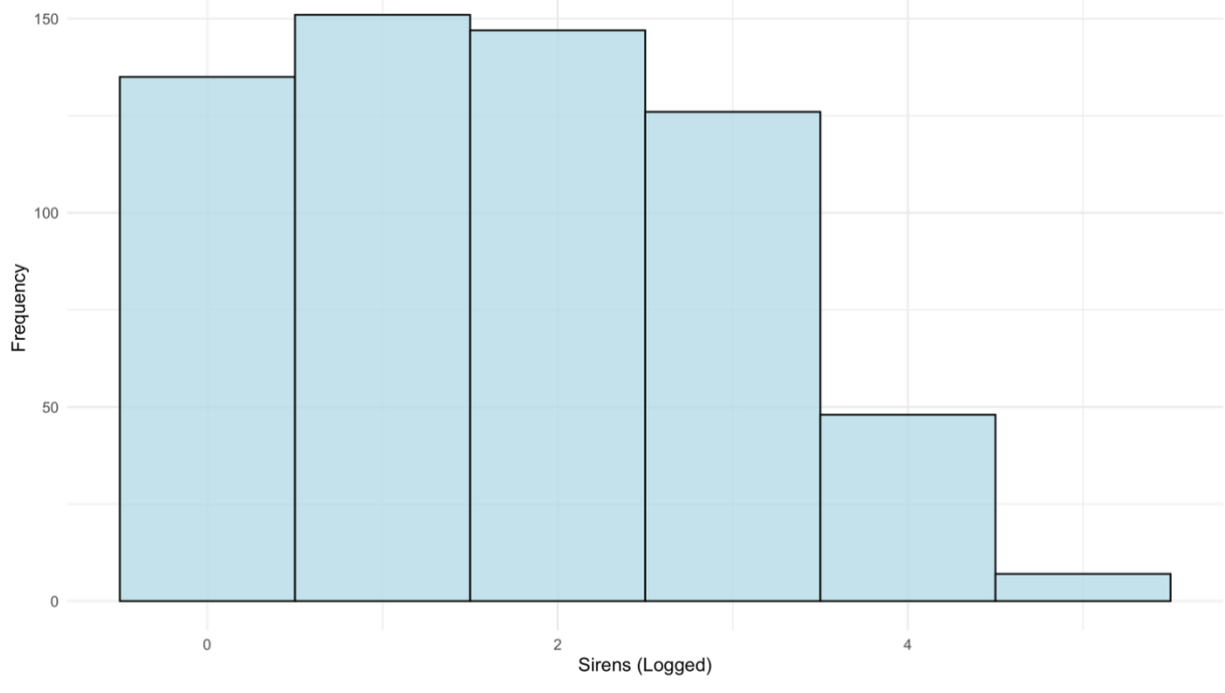


Table 5.C19: Dependent Variable Descriptive Statistics

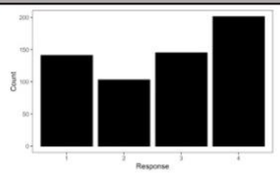
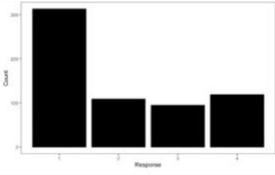
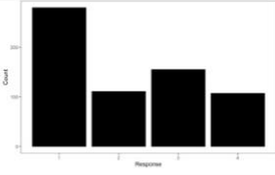
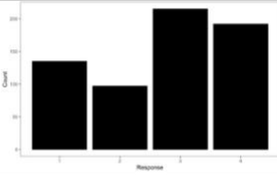
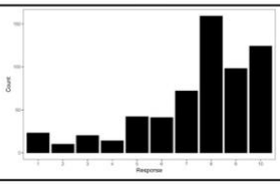
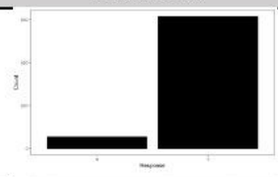
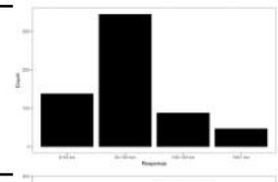
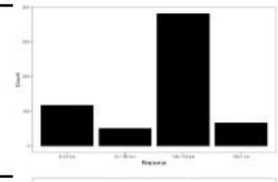
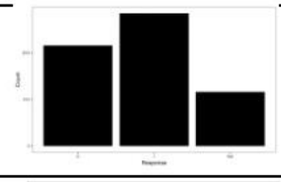
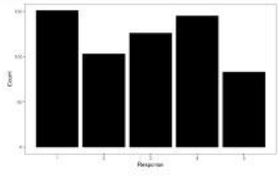
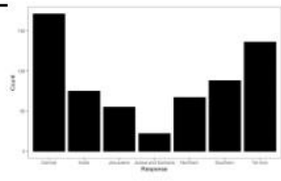
Variable	Jewish	Non-Jewish	Distribution (Jewish)
Ground Troops Limited	Strongly disagree: 141 (23.0%) Moderately disagree: 103 (16.8%) Moderately agree: 145 (21.6%) Strongly agree: 201 (23.6%) NA's: 24 (3.9%)	Strongly disagree: 49 (89.1%) Moderately disagree: 0 (0.0%) Moderately agree: 0 (0.0%) Strongly agree: 2 (3.6%) NA's: 4 (7.2%)	
Ground Troops to Topple Hamas	Strongly disagree: 271 (44.1%) Moderately disagree: 107 (17.4%) Moderately agree: 92 (15.0%) Strongly agree: 118 (19.2%) NA's: 26 (4.2%)	Strongly disagree: 41 (74.5%) Moderately disagree: 2 (3.6%) Moderately agree: 3 (5.5%) Strongly agree: 1 (1.8%) NA's: 8 (14.5%)	
Immediate Ceasefire	Strongly disagree: 276 (45.0%) Moderately disagree: 110 (17.9%) Moderately agree: 145 (23.6%) Strongly agree: 69 (11.2%) NA's: 14 (22.8%)	Strongly disagree: 4 (7.2%) Moderately disagree: 1 (1.8%) Moderately agree: 9 (16.4%) Strongly agree: 38 (69.1%) NA's: 3 (5.5%)	
Negotiations with the Palestinian Authority	Strongly disagree: 133 (21.7%) Moderately disagree: 96 (44.9%) Moderately agree: 215 (35.0%) Strongly agree: 140 (22.8%) NA's: 30 (4.9%)	Strongly disagree: 2 (3.6%) Moderately disagree: 1 (1.8%) Moderately agree: 0 (0.0%) Strongly agree: 51 (92.3%) NA's: 1 (1.8%)	
Government Grade	1: 23 (3.7%) 2: 10 (1.6%) 3: 20 (3.3%) 4: 14 (2.3%) 5: 42 (6.8%) 6: 41 (6.7%) 7: 72 (11.7%) 8: 159 (25.9%) 9: 98 (16.0%) 10: 124 (20.2%) NA's: 20 (3.3%)	1: 33 (60.0%) 2: 0 (0.0%) 3: 1 (1.8%) 4: 1 (1.8%) 5: 3 (5.5%) 6: 2 (3.6%) 7: 2 (3.6%) 8: 2 (3.6%) 9: 1 (1.8%) 10: 1 (1.8%) NA's: 9 (16.4%)	

Table 5.C20: Key Control Variable Descriptive Statistics

Variable	Descriptive Statistics	Distribution
Jewish	Jewish: 615 (91.8%) Non-Jewish: 55 (8.2%)	
Gaza Border Distance	Min.: 3.181 1st Qu.: 51.183 Median: 58.618 Mean: 73.889 3rd Qu.: 83.271 Max.: 208.317	
Lebanon Border Distance	Min.: 0.00 1st Qu.: 85.03 Median: 112.00 Mean: 105.80 3rd Qu.: 130.80 Max.: 366.97	
Right	Yes: 284 No: 215 NA's 115	
Income	Min.: 1.000 1st Qu.: 2.000 Median: 3.000 Mean: 2.845 3rd Qu.: 4.000 Max. 5.000 NA's: 62	
District	Central: 171 Haifa: 75 Jerusalem: 55 Judea and Samaria: 22 Northern: 67 Southern: 88 Tel Aviv: 136	
Total Matched Observations	**670 / 705 (95.0%)**	

Chapter 6
Learning the Right Lessons: National Security, Public Opinion, and AI

"Artificial intelligence is going to matter greatly, and indeed, already does. It matters, then, that we understand the politics that surrounds it, and that we ultimately lay the groundwork for the governance of a technology that is poised to be transformative."

– JADE LEUNG, CTO OF THE UK AI SAFETY INSTITUTE, UNIVERSITY OF OXFORD DPHIL DISSERTATION, JULY 2019

6.1 Summary of Findings

On November 30, 2022, OpenAI released its Chat GPT-3 model to the public, revealing the ability to form paragraphs in multiple languages with relatively high degrees of accuracy. For the technical experts who had started tracking developments in artificial intelligence before DeepMind's AlphaGo defeated the world's best Go player in 2017, the performance of OpenAI's large language model was relatively unsurprising. But for the public, the Chat-GPT moment truly bought the transformative power of artificial intelligence into their purview. What was once being developed quietly in cool start-ups in Silicon Valley and, to an increasing degree, in Zhongguancun (Beijing's equivalent to Silicon Valley), and was regularly discussed by perhaps a few hundred people, had proliferated into the purview of 180 million users. There are many more who have increasingly consumed news about the technology and use related chat interfaces like Claude. It entered the public eye at a time of tremendous geopolitical challenge following Russia's invasion of Ukraine beginning in 2022 and increasingly cold relations between the United States and People's Republic of China, largely surrounding Taiwan. Historical lessons from emerging technologies of yesteryear force us to ask: was ChatGPT's release in November

2022 the Sputnik moment for AI? If so, *how* will AI affect the relationship between public opinion and national security? Learning the right lessons from how other emerging technology contexts have altered shaped the public opinion-national security relationship offers a critical anchor to begin thinking about these speculative — but critical and timely — questions.

The fate of 21st century emerging technologies in the national security realm will not and should not be determined exclusively in boardrooms and situation rooms, as the technocratic school has argued. Instead, as much of the IR literature on democratic constraint argues, today elected leaders tasked with developing national security policy are constrained by their constituents, concerned with polling data, and forced to balance security imperatives with demands from a public that may change the trajectory of emerging technology-related national security legislation. Although the technical nature of emerging technologies may make them initially seem like unlikely candidates to face particularly strong public opinion constraints, emerging technology issues in the national security domain have often been shaped by public opinion pressures. Building on existing literature highlights that this will be especially true in the remaining decades of the 21st century, as emerging technologies bring security from the national and international domains to the level of the individual.

The localization of security has had three key vehicles: consumption, production, and experience. First, individuals themselves **consume** emerging technologies that are dual-use, making their everyday consumption decisions important in the national security domain. Individual information and the aggregate data collected is seen as a critical national security asset which is a key input into many contemporary technologies. Moreover, trade-offs between security and other factors, such as economic prosperity, can both structure the nature of consumption on their own or constrain government preferences in aggregate. Second, as states have realized it is important for them to **produce** critical technology inputs and maintain chokepoints in the era of weaponized interdependence, it has become more important for states to invest in their domestic infrastructure and fund ambitious industrial policies and impose costly technology-preserving economic statecraft measures to remain competitive and maintain their national security. However, maintaining these chokepoints has domestic foundations — publics must be willing to endure economic and other costs to maintain their strategic advantages. In addition, these chokepoints face both external and internal threats which threaten to undermine strategic advantages. Public preferences around the production of critical technologies can thus shape the durability of the chokepoint, with key implications for geopolitics and the distribution of global chokepoints more broadly. Finally, emerging technologies transform how individuals **experience** security, specifically through the experience of conflict. Emerging technologies can shape both the

frequency and the nature of encounters with violent conflict. While improvements in offense, such as through growing lethal autonomous weapons capabilities, may increase harm for civilians, defensive improvements in technologies like anti-missile defense systems could reduce or transform how civilians experience violent conflict, reducing their exposure to material harm. These three categories provide a framework to conceptualize how emerging technologies bring security issues to the local level and provide a starting point for building mid-level theories that explain how variation in the national security environment shapes public attitudes.

Individual preferences for consumption of dual-use technologies follow friendshoring logics. Dual-use emerging technologies are both strategically critical and contain a wide range of suppliers, creating a dual-use security-price trade-off that conventional technologies like stealth planes, nuclear submarines, and aircraft carriers lack. In these dual-use technology cases, individuals can buy technologies domestically, from allies, and from adversaries, each of which creates a novel security-price trade-off. Publics make these trade-offs according to a friendshoring logic, which I call *alliance-based price elasticity*: market forces are more important when consumers are faced with a technology produced domestically or from an allied country, while security wins out when faced with a choice between domestic and adversary-produced technology. To test this theory, I created a novel survey experiment conducted in the UK, varying the cost and source of surveillance technologies to be incorporated in British public spaces. While discounting Chinese dual-use technology resulted in a modest drop in the probability the respondent preferred British technology, offering American technology at a discount resulted in a far more substantial drop in the preference the respondent would prefer to buy British, showing that American technology price decreases are more likely to win the hearts, minds, and wallets of British consumers compared to the same price decreases in Chinese technology. Although publics do not display an understanding of technical risks associated with relying on foreign surveillance technologies, ally-adversary dynamics rooted in broader economic protectionism shape individual preferences for consuming dual-use technologies.

While publics are willing to endure costs of living increases to counter adversarial tech competition, their willingness to accept a greater economic burden faces both partisan and generational divides. States have realized that controlling the production of key emerging technologies is a source of power in the international system, providing them with the power to leverage chokepoints through weaponized interdependence. However, maintaining these production chokepoints is economically costly and faces both external and internal threats, prompting a challenging individual pocketbook-collective security trade-off. Using an original survey experiment in Taiwan, I show that

publics primed with tech competition from the PRC are more willing to endure substantial cost-of-living increases than those in the control. However, willingness to sacrifice individual economic benefit for collective security faces internal division: DPP voters are far more willing to accept cost-of-living increases than opposition KMT and TPP voters, while younger voters (20-29) are much less willing to tolerate price increases than older voters (70+). These findings suggest that despite strong rally effects against external tech competition, Taiwan faces possible internal threats to its critical semiconductor industry with polarization and generational differences in preferences.

Improvements in defensive technologies reveal that psychological mechanisms may drive hawkish attitudes following exposure to violence. Emerging technologies transform how individuals experience security, with the potential to influence both offensive and defensive capabilities in conflict. Dramatic improvements in access to and capabilities of anti-missile defense technologies have created conflict environments in which material violence has been minimized, forcing a reconsideration of what it means for individuals to be exposed to violence. Violence exposure, I argue, encompasses not just material but also *psychological mechanisms*, including uncertainty and traumatic triggering, each of which requires a different counter-terrorism remedy. The Israeli defense landscape in 2014 offered the perfect testing ground for a security environment dominated by psychological mechanisms: material violence in the form of deaths, injuries, and property damage, was substantially reduced with the proliferation of and improvement in the capabilities of the Iron Dome, while Hamas continued to fire thousands of rockets that triggered psychological mechanisms. I test the theory by leveraging the substantial inaccuracy of Hamas' rockets as a source of as-if random variation, showing that exposure to siren alarm during the 2014 Israel-Gaza War was associated with statistically significant localized increases in hawkish policy support across a range of measures such as a ground troop invasion, and decreased support for dovish policies like ceasefires. This article therefore demonstrates that even when violence does not cause material damage, appears to be associated with psychological damage through fear and disruption, representing a critical change in the civilian experience of (lack of) security. As defensive technology improves, these non-material mechanisms may grow in their relative importance in terrorism strategy.

6.2 Contributions

This dissertation demonstrates that emerging technologies fundamentally reshape the public-national security relationship by creating new emerging technology-enabled sites of democratic constraint:

Security becomes consumptive. The friendshoring paper highlighted that dual-use technologies have a public-facing economic dimension that conventional security technologies generally lack. This

framework can be used to think through a broader set of dual-use technologies, including technologies like AI systems that that are deeply embedded in everyday life. It underscores that consumer choices may shape markets for strategically important goods, and that public preferences and national security priorities may or may not align.

Strategic technological advantages require public buy-in. The chips illustrated that chokepoints have public opinion constraints that threaten states' ability to build and maintain networked power. It is not inevitable that all publics will be willing to pay the price (economically or otherwise) to maintain critical advantages in emerging technology, and I show that partisan cleavages and demographic change threaten to fracture domestic support. Thus, while all states desire to build and maintain chokepoints, their ability to do so may vary based on domestic interests.

Defensive technologies may change conflict itself. As the sirens paper shows, non-material mechanisms may induce localized increases in hawkishness, mechanisms which may become more important if defensive technologies improve. Moreover, as access to anti-missile defense technologies expands to other contexts like the Ukraine-Russia war, these theories may play an important explanatory role in the causes of localized increases in hawkish attitudes.

These cases offer insights into empirically significant cases at the intersection of geopolitics and emerging technology. They include the UK traversing U.S.-China tech competition, threats to Taiwan's Silicon Shield amidst concerns of PRC invasion, and the role of Israel's defensive technology amidst conflict with Hamas. How the UK and other Western democracies choose to regulate procurement may structure technological supply chains and levels of dependencies between states. I illustrate that the British public supports importing sensitive emerging technology when the price is right, but only with allies and partners. Moreover, the dissertation's chips paper provides critical insights into public opinion on semiconductors on Taiwan amidst calls by U.S. politicians for Taiwan to invest more in its security and broader fears of invasion and great power war. This dissertation highlights both Taiwan's public's strong commitment to supporting its semiconductor industry, as well as partisan and demographic threats to that commitment. Finally, in the case of Israel, I show that violence drives hawkish attitudes even without exposure to material violence, facilitating dynamics that create public opinion incentives to launch ground offensives in Gaza. For Prime Minister Benjamin Netanyahu's current coalition, this dissertation reveals that the government has strong incentives to prolong conflict and to react harshly when Hamas sends rockets, which is relevant as conflict is ongoing and broader regional war threatens to break out.

Policymakers should consider my theories' implications during policy formation and implementation. While the goal of this dissertation is not to offer direct policy prescription, there are important lessons policymakers can learn from my research when creating and implementing policy. First, I illustrate that while publics follow a friendshoring logic when it comes to dual-use technology preferences, this does not reveal publics understand technical risks. Instead, the public's motivation to securitize adversarial technology reflects a desire for protecting jobs, not a securitization against technology-specific risks, which may impact the framing politicians use as they regulate dual-use technology procurement and mergers and acquisitions. Second, countries trying to maintain technological chokepoints must gain sufficient economic buy-in from the public, but their ability to do so may be conditioned on the party in offices and, over time, generational changes in attitudes. Finally, policymakers in countries deploying emerging technologies to engage in counter-terrorism should consider whether their counter-terrorism strategies eliminate the root cause of the threat they face. My research suggests that for countries like Israel, efforts to reduce the ability of terrorists to launch rockets in the first place may be critical to reduce the psychological consequences of violence.

6.3 Avenues for Further Research

This dissertation provides important avenues for further research that will contribute to a more robust research agenda at the intersection of emerging technology, public opinion, and national security.

Test external validity with respect to geography. First, comparative studies should test the mid-range theories developed as part of this dissertation in different geographical contexts. For example, how would the public in a country more firmly stuck in the middle between the U.S. and China, such as Turkey, respond to price-security trade-offs? External validity questions also apply in the case of chokepoints — how much would Dutch people be willing to pay to maintain a comparative advantage in lithography? How do psychological mechanisms influence public opinion in the context of the current war in Ukraine?

Test external validity with respect to technology type. Similar external validity testing could be undertaken by testing how well the theories travel not just to other geographical contexts, but also to the study of different technologies. Would the results substantially change if we studied laptops instead of surveillance cameras? What if we studied chokepoints in the biosecurity supply chain as opposed to chokepoints in the semiconductor supply chain? Answering these types of questions will strengthen the external validity of the theories and clarify scope conditions. This includes further inquiry into variation

within technological classes interrogated within this dissertation like dual-use technologies, where variation in technical nature, their geopolitical importance, role in supply chains, and current regulatory status could shape public preferences.

Relax regime type assumptions. In addition to studying democratic publics, further research should explore whether and how emerging technologies bring security issues closer to individuals in authoritarian publics, thereby developing a more robust understanding of how sensitive my theory is to regime type. Authoritarian states lack selection and responsiveness mechanisms, but authoritarian leaders are still sensitive to domestic constraints (e.g. Weeks 2012). It is quite likely that emerging technology issues are publicly salient, but the mechanisms through which public opinion shapes national security policy may vary substantially across issue areas.

Probe how uniquely responsive national security stakeholders are to public opinion on 21st century emerging technologies. Further research should also dig deeper into whether the way public opinion influences national security outcomes is different for 21st century technologies compared to the historical cases that motivate the theory. Developing this understanding may take decades until archives allow us to be privy to intimate closed-door conversations. But this information will allow us to better understand whether elected leaders see 21st century emerging technology issues as closer to the public compared to other national security questions.

Study how emerging technologies moderate foundational international relations theories beyond the relationship between direct exposure to violence and attitudes. The dissertation's third paper, which rethinks on the relationship between exposure to violence and attitudes toward the use of force, offers a model for studying the public opinion-national security-emerging technology nexus that can be extended. For example, how will increases in emerging technology capabilities affect the relationship between employment in industry and protectionist attitudes? How will increases in emerging technology capabilities affect which types of violence are seen as legitimate? In each of these cases, emerging technology forces us to reconsider the mechanisms driving foundational international relations theories.

6.4 Advancing this Research Agenda in the Age of AI

This dissertation also points to the need for developing a broader research agenda that will address the intersection of public opinion, national security, and artificial intelligence. Now that Chat-GPT and other large language model-powered chat interfaces have been dropped into the public's lap, this intersection is

no longer speculative. As AI capabilities increase and its use-cases become publicly salient, AI may well prove to be the technology that is most publicly salient, deserving of study from both academics and the think tank community.

Cross-Country Variation in The Salience of AI-Related National Security Concerns and Trade-offs. National security considerations have increasingly shaped the policy conversation around frontier AI, but understanding of these risks has been largely dominated by technical experts and policymakers. As a first step to studying public opinion on AI-related national security concerns, scholars should track which publics understand AI as a fundamentally national security issue, and track changes in issue salience and conceptualization over time. Furthermore, scholars should study how individuals navigate trade-offs between security and a range of other factors such as economics, privacy, environmental factors, and product quality. More granularly, specific features of the technology, including their technical architecture, safety, and country of origin, may shape important consumption patterns and, by extension, global markets.

Variation in Cultural Understandings of Foundational AI Concepts Such as Safety, Transparency, and Bias. Most countries have agreed to a global consensus that AI should be developed in a safe, transparent, and bias-minimizing manner. However, different countries may have different understandings of each of these concepts — for example, the Chinese word 安全 means both safety and security, facilitating debate over how to best operationalize the concept. Different cultural norms and ideas, which are sociological and deeply engrained with the public — may lead to different operationalizations of these core concepts and others, creating challenges to building global consensus. Public opinion work in this area should conceptualize different areas of safety and explore areas of global consensus and divergence.

Variation in Domestic Threat Models. Threat models — frameworks for understanding ways in which AI could be deployed to cause harm — provide a critical foundation for frontier model evaluations to test and ensure their safety. However, different countries may have different threat models — what may threaten one state may not threaten others. Public opinion provides one venue through which to study how different countries and their publics understand threats, showing areas of consensus and divergence on the microfoundations of threat models that ultimately shape safety evaluations.

Domestic Foundations of AI Arms Racing. Future research should study whether and under what conditions publics support arms racing for frontier AI, especially the U.S. and Chinese publics as the

countries which are likely to matter most. Research in this area could build on the microfoundations of the security dilemma developed by Kertzer, Brutger, and Quek (2024), exploring whether publics support arms racing in the critical case of frontier AI.

Domestic Sources of Global Competitiveness in Emerging Technology and Their Threats: Polarization, Industrial Policy, and Immigration. In addition to studying the possibility of arms racing, researchers should investigate whether and how AI gets both polarized and securitized within different domestic contexts, perhaps most notably through different attitudes toward industrial policy and immigration. Might Republicans one day be more supportive of restricting global access to frontier AI than Democrats, or vice versa? Or will there be a different cross-cutting cleavages across the national security and AI domains, connecting to existing interest groups concerned about topics like privacy? What about in other countries? There may also be demographic variation tied to income, age, and gender that ultimately shapes AI national security conversations and coalitions. Industrial and immigration policies represent two key frequently salient areas of domestic politics that face domestic polarization.

The Role of the Tech Private Sector in Public Opinion-National Security Dynamics. Companies are key sources of national competitiveness. In the case of some companies like TSMC, company choices and outcomes are intimately tied to national security. However, the market power and national security importance of these companies may give them disproportionate influence in political processes and even shape public awareness of evidence on key issues of frontier AI risks (Bommasani et al. 2025; Bommassani, Singer, et al. 2025). Future quantitative research can study how publics understand the benefits and risks of providing financial support to big AI companies across the supply chain, while qualitative research can study how companies mediate public opinion-national security dynamics in the emerging technology sphere.

6.5 Final Words

Another of Duncan Snidal's DPhil students, Jade Leung, was far ahead of her time when she submitted her DPhil dissertation on the politics of AI governance in 2019. Before she went on to serve as the inaugural Chief Technology Officer at the UK AI Safety Institute, she warned, "Artificial intelligence is going to matter greatly, and indeed, already does. It matters, then, that we understand the politics that surrounds it, and that we ultimately lay the groundwork for the governance of a technology that is poised to be transformative" (Leung 2019). I echo her foresightful statement, with a new caveat informed by this dissertation:

Public opinion is going to matter greatly for the future of artificial intelligence, and indeed, already does. We need to understand how publics are grappling with it, because their input will be critical to the trajectory of AI's development, deployment, and holistic trajectory in national security and beyond.

Like most IR literature, this dissertation is ultimately largely about structure and agency. More than that, it is about locating agency by asking the public about their preferences in the spaces we least expect it: in war, amidst great power competition, and in a world made radically more uncertain by increasingly transformative artificial intelligence. These phenomena and possibilities will structure the ways through which publics engage with AI and national security outcomes, but they do not inevitably define their path. As citizens, we collectively have the power, and indeed the responsibility, to push our policymakers to develop and govern AI in responsible ways. Your choices over the next few years could fundamentally alter the trajectory of what may be the most transformative technology in human history.

AI can bring the world a lot good — not just by lifting people out of poverty, helping cure diseases, and mitigating global challenges like climate change, but also by enabling fundamentally new scientific and technological discoveries that create currently unfathomable possibility. As this dissertation acutely points out, there will be challenging trade-offs and circumstances created by new technologies and transforming geopolitics. These will only become more salient as AI brings national security and much broader transformation intimately into our lives. As this happens and the words from this dissertation fade into time, I sincerely hope we prove the realists of yesteryear wrong. The public voice must steer our uncertain geopolitical and technical future for the better; governments must empower their citizens with the knowledge needed to make good, informed decisions.

We — as an academic discipline, field of policy, and indeed all of humanity — must rise to this challenge.

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