INTENT V. OUTCOME ON ANTI-PLASTIC POLLUTION ACTIVITY

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When it comes to plastic pollution, we continually hear about policy ideas and promises to "do better" from governments around the world, especially from big-hitters like India and China, but we rarely see a focus on whether or not they are actually following through. Past literature has not adequately measured intent and outcome for countries that produce large amounts of plastic pollution, which is what this research aims to do. Specifically, data will be analyzed regarding China, India, Australia, and New Zealand. China and India produce some of the most plastic pollution, and Australia and New Zealand produce some of the least. Their green mindsets, exhibited by the amount of anti-plastic pollution policies we have seen from them recently, can be compared with how much plastic pollution they produce to measure their intent and outcome, respectively. I argue that whether or not a country has the right mindset can dictate whether or not their promises aimed at eliminating plastic pollution are fruitful or not. In conclusion, this project closely examines anti-plastic pollution policies in relation to the amount of plastic a country produces, which sheds light on gaps found in previous literature on the topic.

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Introduction

When it comes to plastic pollution, we continually hear about policy ideas and promises to "do better" from governments everywhere, especially from big-hitters like India and China, but are they actually following through? This line of questioning creates a framework in which it would be interesting to research environmental advocacy policies being implemented in countries around the world and seeing how they compare. Plastic pollution is largely measurable and has an important impact on human health, especially within the past 50 years or so, making it an extremely relevant study topic. Knowing this, we can ask the question: Why is implementation of anti-plastic pollution policies seen in some countries and not others?

It is one thing to create policies, but to follow-through is another, arguably more important aspect. That being said, there are a couple different answers to this question, with many different factors at play. A country may implement anti-plastic pollution policies more so over others because they have more funds in order to not only discuss and create them, but execute them. In some countries, eliminating plastic pollution might be held in a higher regard due to their culture and social ideologies. Along that same vein, it may be because they have a quota to fill that they have created for themselves due to those social beliefs. Some countries might have no other choice but to implement these policies over others because their country would suffer without them.

To do this, 4 countries will be looked at as case studies: India, China, New Zealand, and Australia. China and India have some of the worst plastic pollution, while New Zealand and Australia have some of the least. Alongside this, New Zealand and Australia have less amounts of mismanaged waste per person than India and China. The literature review discusses possible explanations for why this is seen, which can then be used to format the research design.

The literature review consists of sources that elaborate on 3 schools of thought that reveal information on why this kind of phenomena may be occurring. The review goes over wealth and poverty, elimination of plastic pollution feasibility, and green mindsets and citizen knowledge (in that order). From this information, a framework is built, allowing variables to come forward that will dictate the research design. In other words, what is found in reviewing previous literature surrounding the research question directly forms what kind of research needs to be done and how it can be done.

From the literature review, 3 competing explanations jump out. They are:

1. The amount of wealth a country has at their disposal dictates how they tackle their plasticwaste, assuming if they have more money, they will be able to do it more efficiently.

2. A country's plastic waste is not even feasible.

3. A country's mindset/citizen knowledge and whether or not it is future-focused and green determines whether or not they actually follow through on the quotas they have set forthemselves.

The third one makes the most sense with the literature at hand, which is explained in more detail within the research design. I argue that whether a country maintains a green mindset or not dictates whether a country's implementation of anti-plastic pollution policies are created at all or are followed through. Based on this, the hypothesis is: the greener a mindset a country has, the more anti-plastic pollution policies they will create and follow through on. In other words, we will see better anti-plastic pollution outcomes from countries that have greener mindsets. A country may make promises on reducing their plastic emissions, but their mindsets surrounding the topic dictate whether or not they actually do it.

The research design will take on a qualitative approach by observing a small number of cases, exploring them in detail to see whether the argument holds true. By using a positivist approach, previous findings can be used to generalize about other outcomes (and therefore prove or disprove the argument). The data collected comes from Our World in Data and various government sites that display what kind of

action they are taking (or claim to be taking). The data analyzed will come from the last 4 years (2019 to 2023) since the statistics used for generated plastic waste per country was formed in 2019 and at the time this is written, the last fully completed year was 2023. Like previously stated, the case studies include India, China, New Zealand, and Australia. By using data, we will be able to look at which countries exhibit green mindsets, high citizen green knowledge, and whether that equates to equal amounts of intent and outcome.

Literature Review

Why is implementation of anti-plastic pollution policies seen in some countries and not others? Intent and outcome will be measured, qualitatively. In order to do so, we have to look at the different approaches as to why a country's intent might not match their outcome, which is revealed through different schools of thought. One may be the amount of wealth a country has at their disposal, which is labeled as the wealth and poverty school of thought going forward. If a country has more resources to tackle their plastic waste, it is easy to assume they will be able to do it more efficiently. However, this first school of thought does not align with the fact that countries with a high amount of capital still produce tons of plastic pollution.

Another may be whether or not reducing a country's plastic waste is even feasible or not, which can be affected by factors such as government intervention and plastic types. This is labeled as the elimination of plastic pollution feasibility school of thought. If a country promises to decrease their plastic pollution, but it was never a feasible outcome, that outcome cannot be fully expected. However, this second school of thought does not explain why a country would not at least recycle what they could, since it has been well-established that recycling is an option (and one that they would be more inclined to take if they held a green mindset).

The last approach we will be looking at is a country's mindset combined with their citizen's knowledge and its effect on whether or not they are future-focused and green, which is labeled as the green mindsets and citizen knowledge school of thought. The mindset a country uses in tackling an issue like plastic waste could dictate whether or not they actually follow through on the quotas they have set for themselves. In accordance with the research question, this last school of thought provides the best framework, arguing that a country's mindset and citizen education dictates how well they tackle their plastic pollution. As such, my thesis going forward is that a country's overall mindset and their citizen's knowledge on green behavior directly activates a country to advocate and implement environmental policies effectively.

Wealth and Poverty

Whether a country has available funds for tackling pollution or not would, assumingly, make a big difference in whether or not they can tackle their plastic pollution. However, this would not explain why very wealthy countries still have large amounts of plastic pollution. Some of the wealthiest countries put out the worst amounts of pollution. We can dive into why this is so by looking at previous literature surrounding the issue.

Studies show that financial development does not entirely sidestep environmental deterioration, which, it would seem, would be helpful in mitigating pollution. In one study, results show a negative relationship between a country's financial development and their ecological footprint for fourteen of the countries analyzed, while the impact of financial development on a country's ecological footprint is positive and significant for thirty of the countries analyzed. This shows that while environmental deterioration is caused by energy consumption and financial development, those same factors can also bring about green investments and industries. This can be mitigated by allocating more funds to socially responsible industries and green environmental projects. However, since energy consumption is a key factor in economic development, introducing renewable energy is a must (Saud et al., 2020). On that same note, in developing countries, economic growth is prioritized in order to sustain their economy, which threatens environmental preservation. This prioritization of economic growth increases demands for

natural resource extraction and industries associated with environmental unsustainability (like mining and deforestation). Using panel data of 70 countries from 2000 to 2018, it was found, using descriptive statistics and correlation analysis, that both income inequality and poverty have a significant influence on environmental quality (Ehigiamusoe et al., 2022). If this is true, we should expect higher plastic polluting countries to experience more poverty, no matter what their promises against plastic pollution are.

To see if this is true, we can look to certain countries as examples, like Denmark.Denmark has a high GDP, digitalization rate, and steady demand for software/IT products. This means they are incentivized to develop environmental technologies. Since emission-cutting technologies are needed globally, they are on the up and up when it comes to being eco-friendly. In short, it is beneficial for a country with a high GDP to be environmentally conscious. Globalization can only help countries like Denmark and could alleviate any environmental consequences they endure (Kirikkaleli et al., 2023). This goes against the previous literature explaining that financial development does not entirely sidestep environmental deterioration. Here, financial development is credited for Denmark's ability to develop green technologies. Furthermore, Denmark's initiatives in involving citizens in making their country more eco-friendly seem to be very fruitful. The world's largest public collection of plastic trash was made possible in Denmark through a low-budget initiative, where volunteers around the country were able to clean their coasts and terrain. More than 150,000 kids and 50,000 adults volunteered and collected 156 tons of trash. Alongside this, it is the first country to complete a national soundscape mapping of their landscapes. This allows studies to be done on how noise pollution affects them. Other countries, like Japan, are drawing inspiration from work like this (Sonne & Alstrup, 2019). This also goes against previous literature, showing that low-budget initiatives are possible. However, are these feats (like being the first country to do extensive soundscape mapping) due to their healthy financials? Also, are these numbers skewed? Larger countries that have more plastic pollution but a higher capacity to process it may look like, on paper, that they are doing better compared to countries with less plastic pollution, even if they are not pulling their weight entirely.

As can be seen, there are shortcomings to this school of thought, since past literature tends to contradict each other. Some say a country's wealth increases green behavior, while others say it decreases it. Even so, these contradictions do reveal some strengths to this approach, since, after all, they all reveal efforts made in decreasing pollution that work. If we can focus on the things that work, we can make efforts towards keeping anti-plastic pollution promises.

Elimination of Plastic Pollution Feasibility

We can sit here and judge exactly how certain countries are performing in reducing their plastic waste, but maybe their scores are skewed because of recyclability rates. There are plastics out there that are not suitable for recycling, which creates problems in how a country tackles their plastic pollution. Plastic pollution is, undeniably, bad for the environment. If it's bad for the environment, it's bad for humankind. The scariest part is that plastic pollution is seen in some areas as irreversible, specifically when weathering processes turn plastic buildup into microplastic particles invisible to the human eye, especially on coastlines. Impacts from plastic pollution include changes to carbon/nutrient cycles, habitat soil, sediments, aquatic ecosystems, biological impacts of endangered species, ecotoxicity, and more. This global threat should be tackled by coordinating waste management internationally and reducing plastic emissions, specifically through consumption of virgin plastics (Macleod et al., 2021). However, this school of thought argues that even with plans of action like the one previously mentioned, the correct mindset, and all the money in the world, reducing pollution is not entirely possible. This would explain why anti-plastic pollution policies do not seem to be followed through on.

Due to contamination, only 55% is suitable for recycling due to contamination. Plastics with unknown or multiple polymer compositions are

harder to recycle. Since household waste has a variety of plastics, it is difficult to sort and recycle all of it. In all, only a little more than half is actually recycled (Kampmann et al., 2018). This would explain why despite policy initiatives, plastic pollution persists. This is why recycling needs to be within a circular framework. Countries like Denmark engage in such practices due to their goal commitments on the recycling side and consuming side. In short, if a person recycles the majority of their waste and then proceeds to buy products that are manufactured from recycling, they have just engaged in and created a circular recycling system. This means plastics get to be used more than once and, to put it plainly, makes a country's plastic pollution numbers go down. In one study on Denmark and Portugal, individuals who recycle in both places tend to increase their purchase of circular products, and that individuals who buy circular products in Portugal have a tendency (albeit weak) to increase their recycling (Stangherlin et al., 2023).

Despite circular framework recycling, recycling everything is impossible. However, bans may put an end to adding more plastic to the problem. India, for example, has been increasing producer responsibility and plastic-ban enforcement. Within the past couple years, more and more policies have been passed and plastic bag bans partially enforced. Although these policies are increasing in number, their implementation is weak and further impetus is needed to increase effectiveness (Nomani et al., 2023). These bans effectiveness is only as good as their implementations. Furthermore, in China, after bans and levies were introduced in 2008, plastic bag usage fell by 70% in Chinese supermarkets. That translates to about 40 billion bags. In Ireland, a 90% reduction in plastic bags was seen after the 2002 levy was introduced. Street vendors and smaller businesses were not affected, though. In other words, where bans/levies were implemented to reduce plastic marine pollution, they were followed (Xanthos & Walker, 2017).

In accordance with my study, it looks like government intervention through the use of bans and levies works. While bans/levies do not eliminate the existing plastic pollution, they protect against more being added. For the material that is added, recycling and collection are feasible options. Of course, there has been irreversible damage made to the coasts through plastic pollution, but that does not eliminate recycling as an option for what is being put into the consumer system. That is why this school of thought is weak, because despite reducing pollution being difficult, it is not impossible. Therefore, it is feasible. But, there are also strengths to this school of thought. It can be gathered from the literature that circular framework recycling and bans/levies are options for countries looking to follow through on their promises to decrease their plastic consumption and pollution. Still, our expectations can be managed by realizing that recycling and undoing all of the damage that has been done is not feasible. It's a give-and-take situation when looking at whether or not reducing plastic pollution is possible, since for every pro, it seems, there is a con. Yes, we can recycle, but only 55% of plastics are recyclable. Yes, we can introduce bans/levies, but they are only as strong as their implementation. Yes, circular framework recycling can eliminate the consumption of virgin plastics, but there are already microplastics invisible to the human eye all over our coasts. It would be silly, however, to assume that the cons to these approaches eliminate them as options.

Green Mindsets and Citizen Knowledge

Whether or not a country has the right mindset can dictate whether or not their promises aimed at eliminating plastic pollution are fruitful or not. This combined with the efforts a country makes at educating the masses on green behavior allows for their green policies to be followed through on. A country could have endless money and come up with systems that allow for feasible recycling and bans, but whether or not their citizens and government leaders understand the importance of these approaches, they won't be effective.

Studies show that the mindset an individual holds can predict how they are going to react to the introduction of eco-friendly products. Across five experiments, it was seen that those with abstract level mindsets have more positive reactions to eco-friendly products. This is

because abstract mindsets are focused on the future. Yet, it was also found that consumers with a concrete mindset still have positive responses to eco-friendly products when they are advertised in the present tense. So, no matter the mindset, environmental change is doable. It just depends on the approach (Reczek et al., 2018). Based on this, we can infer that countries with both kinds of mindsets can be made mentally available in implementing eco-friendly policies and actually following through on them. Increasing information availability about plastic pollution in countries who exhibit more concrete mindsets would explain to them why green options are desirable, catering to their concrete level mindset and urging them to make greener choices. When this approach is used, those with abstract mindsets are still affected positively, so there is no downside.

Like said previously, though, these approaches can only be implemented combined with green education. What does this look like in countries that do not have this kind of information readily available to them? According to Sohaib Mustafa et al., people in developing countries have less knowledge about going green, so policy implementation is therefore more difficult. In order to make policies more easily implemented, educating the masses on green behavior is a must. When people are aware of what being eco-friendly does for the planet, they are more likely to engage in that behavior. Furthermore, using eco-friendly products can create jobs in dwindling economies, especially when it comes to recycling (Mustafa et al., 2022). In regards to my study, this could explain why top plastic polluters have difficulty implementing their policies.

Speaking of effectiveness of implementing policies, in 1991, a program was initiated through the Environmental Protection Agency (EPA) called the 33/50 Program. It was the EPA's first voluntary pollution prevention program. In a study by Martina Vidovic and Neha Khanna, 19 industry groups were analyzed. While the program was successful in attracting the most polluting firms, the decline in emissions observed from 1991-1995 was found to not be a direct result of the program. The results of the study actually indicated that firms that reduced their emissions prior to the initiation of the program were more likely to participate in the program, and once they did so, their emissions were higher during the years in which the program was in existence. Furthermore, lowered emissions during the length of the program were seen by firms who had achieved large past reductions in their emissions (Vidovic & Khanna, 2007). In short, there is evidence that programs don't really matter. It's the mindset of major corporations in decreasing pollutants. On that same note, in another study it was seen that the success of volunteer beach cleanups are dictated by the mindsets an environmental group has, and has a big effect on mitigating plastic pollution. Volunteer beach cleanups not only clean beaches, they lead by example and urge social learning, spreading the word and educating others on why cleanups are necessary. It's seen that tributary groups strengthen larger campaigns, which then diffuses their knowledge and goals from the local level to the global level. In this way, they foster environmental stewardship (Jorgensen et al., 2021). Imagine if this was applied to every country. Would we see better kept promises?

India has some of the worst plastic pollution, so we would assume based on the previous findings that their mindset towards going green is not suitable towards that goal. However, this is shown to not be true, since we see India is making efforts by enforcing bans on single-use plastics and partnering with UNEP to fight their plastic waste. Nevertheless, it's seen that coverage of technological advancements are being utilized so India appears green and eco-friendly, when in reality, there is a big divide between the plastic sector and consumers (Bagai & Henam, 2021; Pathak & Nichter, 2021). The communication between the two is lacking. In the blame-game that persists between citizens and stakeholders, taking accountability and actually implementing change is easier said than done. Ecological citizenship requires a deep understanding of sustainability, whereas consumer citizenship is defined by the citizens ability to be a driving force in a market. Consumer citizenships can be targeted with messages on their responsibility to go green, which creates a false sense of greenness without

actually making structural changes, especially when activist discourse is absent. This is how India is able to distract from collective action while also appearing to care about going green without sacrificing their economic development (Pathak & Nichter, 2021). Despite the literature revealing this, it is important to note that this behavior may or may not be a conscious choice on behalf of India. Increasing plastic pollution and how it may be caused by economic desperation should not be ignored. That is why this school of thought is so interesting. It is multifaceted, showcasing exactly why it should be studied.

In conclusion, this school of thought is strong when approaching this study because it looks at the root cause of why a country might not take action against plastic pollution in the first place with what resources they have despite promises they make. Especially when looking at the literature from Gauri Pathak and Mark Nichter, it is seen that knowledge and taking accountability go hand-in-hand, which is what this school of thought is all about. Going forward, this school of thought will be extremely helpful in creating the framework needed for this study, which is why my study aligns with it the most. Although these sources show that green mindsets and citizen knowledge are big factors in anti-plastic policy implementation, they do not apply their findings to a wide array of countries to see which countries depict these behaviors the most/least and why. By combining the past literature with this study, the "why" and "where" can be revealed to answer how these countries perform in comparison with their promises.

Research Design

It is no question that plastic pollution has become an issue worldwide. However, there is a question as to why more anti-plastic pollution policies are seen in certain countries, less in others, and varying degrees of plastic pollution throughout. In order to answer the question, "Why is implementation of anti-plastic pollution policies seen in some countries and not others," a positivist approach will be used, which means that previous findings will be used to generalize about other outcomes. The independent variable for this research is a country's green mindset, and the dependent variable is their implementation of anti-plastic pollution policies. Previously, competing explanations besides green mindsets were discussed, but green mindsets will be the main focus going forward.

Variables

The independent variable is a country's green mindset. By breaking down this term, it can be conceptualized. When the term "green" is used in this context, it is defined through Merriam-Webster as "tending to preserve environmental quality." The term "mindset" is defined, also through Merriam-Webster, as "a mental attitude or inclination" (Merriam-Webster, 2023b; Merriam-Webster, 2023c). When this is put together, a green mindset is the mental inclination one has towards preserving the environment. A country's green mindset can be operationalized by discussing how it will be measured. Therefore, this will be measured based on the amount of plastic pollution a country creates combined with how much plastic waste they mismanage. This will be gathered from Our World in Data, a scientific online publication published by the Global Change Data Lab.

The dependent variable is the country's implementation of anti-plastic pollution policies. For the term "anti-plastic pollution policies," there are quite a few words used. Let's break it down. "Anti," when used as a prefix, is defined as "one that is opposite in kind to." "Plastic" is "any of numerous organic synthetic or processed materials that are mostly thermoplastic or thermosetting polymers of high molecular weight and that can be made into objects, films, or filaments." "Pollution" is defined as "the action of making an environment unsuitable or unsafe for use by introducing man-made waste." "Policy" is defined as "a definite course or method of action selected from among alternatives and in light of given conditions to guide and determine present and future decisions" (Merriam-Webster, 2023a; Merriam-Webster, 2023d; Merriam-Webster, 2023f; Merriam-Webster, 2023e). Put all together, anti-plastic pollution policies are carefully selected courses of action meant to determine present and

future decisions against man-made synthetic/ processed polymers of high molecular weight that make the environment unsafe for use. This will be measured by analyzing how many policies a country has pushed forward in the last 4 years, since the data collected for plastic waste was generated from statistics in 2019 and it is 2023 now.

Methodology

The methodology going forward will be a qualitative one utilizing case studies, since the research will consist of observing a small number of cases, exploring them in detail to see whether the argument holds true. By looking at certain case studies of certain countries based on the amount of plastic pollution they produce, a value will be assigned to each one, those being high, medium, and low. The same goes for the amount of policies they have developed.

Hypotheses

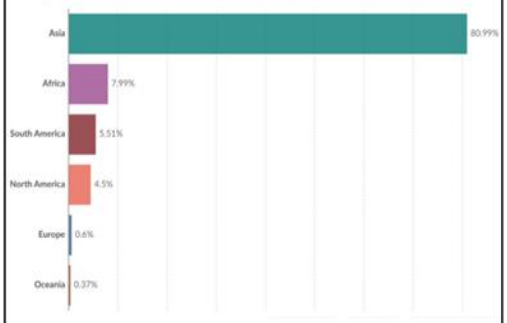
Based on the literature review, there were 3 competing explanations: 1. The amount of wealth a country has at their disposal helps tackle their plastic waste, so it can be assumed they'll be able to do it more efficiently, 2. A country's plastic waste might not even be feasible, and 3. A country's mindset/citizen knowledge and whether or not it is future-focused and green determines whether or not they actually follow through on the quotas they've set for themselves. We'll be focusing on the third one.

Case Selection

The cases we will be looking at come from Our World in Data, where an annual estimate of plastic emissions was generated for each country from statistics in 2019. The estimates were generated from marine plastics, not including waste that is exported overseas, so we get a number that is generated on a country's personal plastic pollution and not the plastic pollution another country created and exported to them. That being said, India created 12.92% of global plastic waste emitted to the ocean and China created 7.22%. They were the two highest polluters in this category. When looking at which countries produced the least amount, there were a couple labeled as <0.01%, so figure 1 can be referred to in order to choose which ones to analyze:

Figure 1

Share of Global Plastic Waste Emitted to the Ocean, 2019



Note. A country's total does not include waste that is exported overseas. This graph was provided by *Our World in Data.*

Oceania has the least amount of global plastic waste emitted to the ocean, so we will look at countries from there. Tonga and Samoa were labeled as having 0% global plastic waste emitted to the ocean, but they have very small land masses and so it is understandable. New Zealand and Australia are the next ones up with <0.01% of global plastic waste emitted to the ocean. Since there is more news about their policies, we will be choosing these two as our other case studies.

Hence, we have our four case studies, two that generate large amounts of plastic pollution (India and China) and two that generate the least (Australia and New Zealand). Now that we know which ones to focus on, we can shift to looking at their amount of mismanaged waste per person, which shows each country's citizens' lifestyles more accurately than marine plastics, even though marine plastics were used to choose the case studies in order to get a plastic pollution total. As far as looking at their mismanaged waste, which includes the plastics that don't end up in the ocean but instead, in landfills or incinerated, it is estimated that each citizen of India generates 9.51 kg (20.97 lbs) of mismanaged waste, while in China, it's 8.56 kg (18.87 lbs). In New Zealand, it's 0.36 kg (0.79 lbs) per person and in Australia, it's 0.21 kg (0.46 lbs) (Ritchie, 2022).

The green mindsets which each of these countries holds will be measured by how much anti-plastic movement we have seen from them. To do so, I'll be looking at their government sites for official postings of their policies.

For example, the Asian Development Bank released a brief discussing China's anti-plastic actions (Yee, 2023), The Energy and Resource Institute talks about India's single-use plastic ban (Bharat, 2023), the Nicholas Institute for Environmental Policy Solutions from Duke created a country profile for Australia's plastic pollution policies (Bering & Karasik, 2022), the Ministry for the Environment of New Zealand outlines the plastics they are phasing out (New Zealand Government, 2023), and the Sustainable Ocean Alliance reviews 20 country's actions towards tackling plastic pollution, which includes China and India (Greenberg, 2022).

Justification

The previous explanations do not hold when looking at this research design because each country analyzed has wealth at their disposal and has shown to have recycling capabilities. If either of those explanations were true, we would see large disparities in government wealth between the case studies selected and recycling rates of 0%, but we do not. This means the first two competing explanations are not reasonable for this design. However, the third explanation that dives into green mindsets does work because it analyzes actual approaches a country is making on either end of the pollution scale, whether they contribute large amounts of plastic pollution or they contribute minimal amounts of plastic pollution.is reliant on the data provided by Our World in Data, where a scale is provided. Here is an image straight from the source:

Results and Analysis

Before levels of high, medium, and low are assigned to each case study, it is important to review what this means for them. The values assigned when analyzing the independent variable

Figure 2

Scale of Mismanaged Waste Per Capita

Note. From *Our World in Data*

(the amount of plastic pollution) is reliant on the data provided by Our World in Data, where a scale is provided. Here is an image straight from the source.

A value of "low" means 0 kg to 5kg of mismanaged waste per capita. A value of 5 kg to 15 kg is a value of "medium." Finally, a value of "high" falls into 15 kg of mismanaged waste per capita and above.

For the dependent variable (plastic pollution policy activity), each case study will be analyzed based on how much and what kind of information they have available on their anti-plastic pollution policies. The values assigned to each one will be assigned based on how much information is presented, how it is presented, the ease of which it is accessible or not, and the educational value of it. Not only will these aspects be analyzed, but the way in which they compare to one another will have a large effect on what kind of values they are given. In short, the scores given will be in relation to each other, and not as stand-alone stats. A country's green mindset is in relation to other countries around the world because the extent of their green behavior is depicted on how the other countries are presenting. For example, if not a single country was pushing anti-plastic pollution policies, but one country was, they'd be doing amazing and setting the standard. If everyone was pushing anti-plastic pollution policies, but one country was, they'd be doing amazing and setting the standard. If everyone was pushing anti-plastic pollution policies, then a new standard has been set and the ability to go above and beyond with policy formation and information presentation has just gone up, meaning a country would have to do more in order to stand out. That being said, within the 2019-2023 timeline, we see policy action from each of the case studies selected. Below, a summary of each is presented:

India

According to India's Ministry of External Affairs, they are engaging in assemblies and conventions to discuss possible solutions to plastic pollutants. Words like "should" and "may" are seen in their outline, which shows a degree of non-commitment to decreasing plastic pollution

immediately. They then go on to outline what India and France have committed to doing. I won't go over what France is doing because it is not relevant to the case studies chosen, but India has (i) brought forward rules (as of August 12, 2021) for phasing out identified single-use plastic items with low utility and high littering potential by July 1, 2022 (like light weight plastic bags, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks and polystyrene, plastic plates, glasses cutlery (suchas plasticforks, spoons, knives, trays), plastic stirrers, etc.), and (ii) in February of 2022, created the Guidelines for Extended Producer Responsibility on Plastic Packaging that mandates recycling of different categories of plastic packaging, reuse of identified rigid plastic packaging waste, and use of recycled plastic content in plastic packaging for producers, brand owners, and importers.It proceeds to briefly go over the United Nations' initiatives, which includes India, like adopting Resolution 69, which urges states to take action against plastic pollution by 2025 (Government of India, 2023).

In comparison with the other case studies, the dependent variable is not as present. Yes, there are policies that translate to a green mindset, but there is minimal action that can be seen. The information presented by India was published in 2023 but talks about eliminating this kind of plastic usage by mid-2022, so first and foremost, the timeline does not add up. As far as the transparency and presentation of their information goes, there was a lack of readily available information and policies in comparison to the other countries analyzed. We see language that does not support a sense of urgency and minimal information on whether or not their policies were fruitful. An image of their site can be seen in figure 3.

Figure 3

Example of What India's Information on Their Green Initiatives Looks Like

Note. This can also be found within the bibliography if one wishes to see its entirety.

On January 16, 2020, the National Development and Reform Commission (NDRC) and the Ministry of Ecology and Environment released a policy document outlining a five-year roadmap restricting theuse of plastic products (Zhang, 2021). In the document, certain rules are laid out, such as (i) restriction of non-degradable plastic bags in shopping malls, supermarkets, pharmacies, book stores, and food takeout services in major citiesby the end of 2020 and in other cities/towns by 2022 (except markets selling fresh produce, which are exempt from the ban until 2025), (ii) the banning of single-use plastic utensils and straws for on-site dining in city restaurants by the end of 2020 and in other counties by 2022 (including reduction of single-use plastics in takeout by 30% by 2025),(iii) prohibition of single-use plastic items in star-rated hotels by 2022 and in other hotels/ homestays by 2025, and (iv) the banning of

plastic postal and courier packages in developed areas, including Beijing, Shanghai, Jiangsu, Zhejiang, Fujian, and Guangdong by 2022. This ban will be applied nationwide by 2025 (2020).

As far as the transparency and presentation of their information goes, there is more information available, especially in comparison to India, but it is still lacking. There were multiple sites to traverse and many of them were in Chinese, so it was difficult to decipher as someone who does not speak Chinese (which can be seen in figure 5). With the help of Google Translate and the Library of Congress (which can be seen in figure 4), their reports and web pages could be analyzed. There is definitely more action being taken here, but there's still a lack of information on whether or not their policies were fruitful.

Figure 4

Example of What China's Information on Their Green Initiatives Looks Like

Note. This can also be found within the bibliography if one wishes to see its entirety.

Figure 5

Example of What China's Information on Their Green Initiatives Looks Like

Note. This can also be found within the bibliography if one wishes to see its entirety.

Australia

Right off the bat, the difference in initiative can be seen. Australia has an extensive amount of information available on their mission to fight their plastic pollution. Their timetable lays out their mission and policies over the course of a couple years, which will be briefly summarized here. They explain that in 2019, the Council of Australian Governments (COAG) agreed to establish a timetable to ban the export of waste plastic, paper, glass, and tires and that environment ministers agreed on the National Waste Policy Action Plan (NWPAP). In 2020, the first National Plastics Summit took place, the Recycling and Waste Reduction Act was passed, and microbeads were phased out in rinse-off cosmetics, personal care, and cleaning products. In 2021, the first National Plastics Plan delivered on action 5.5 of the NWPAP, the circular economy roadmap was released by CSIRO, regulations on unsorted mixed plastic waste exports began, the first review of National Environment Protection (Used Packaging Materials) Measure 2011 and the Australian Packaging Covenant to evaluate the co-regulatory arrangements took place, and the National Plastics Design Summit occurred. In 2022, regulations started on unprocessed single polymer or resin waste plastic exports,

Figure 6

Example of What Australia's Information on Their Green Initiatives Looks like

Note. This can also be found within the bibliography if one wishes to see its entirety.

non-compostable plastic packaging products containing additive fragmentable technology that did not meet relevant compostable standards were phased out, expanded polystyrene (EPS) in loose fill and moulded consumer packaging and food and beverage containers were phased out, PVC packaging labels were phased out, and a review of the progress made towards the 2025 National Packaging Targets were done to make sure they were still on track. In 2023, it became

required that at least 80% of supermarket products display the Australasian Recycling Label. They even go on past these years to look ahead into the future, outlining goals they want to enact (Australian Government, 2021).

There was an abundance of readily available information and policies in comparison to the other countries analyzed and their information was very well laid out. It was laid out in a very official pdf format backed by specific members of their government, which was refreshing Having specific names included was nice, which can be seen in figure 6. It was grounding in the sense that there was proof of real people working on making a difference, not just being labeled as authored by an umbrella term for a section of their government (like "by the Department of Environmental Protection"). It was also educational, with different terms being explained so the average person could decipher what kind of action was being taken and why. There was also research presented, which made very clear that steps were being made to not just "clean up," but create long-term solutions by understanding the problem at heart. It is safe to say that Australia exhibits a green mindset in this respect. An image of what their presentation of information looks like can be seen in figure 6.

New Zealand

New Zealand is working towards improving upon old legislation and enacting new policies to combat plastic waste. They say, "We are developing new waste legislation to replace the current Waste Minimisation Act 2008 and the Litter Act 1979. The new legislation will support delivery of many significant nitiatives including the waste strategy and waste actions of the

Figure 7

Example of What New Zealand's Information on Their Green Initiatives Looks like

Note. This can also be found within the bibliography if one wishes to see its entirety.

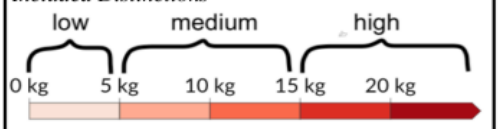
Emissions reduction plan." They then go on to describe what the impact will be, why they are doing it, and how they will. They have multiple goals they have set, like waste legislation reform, phasing out hard-to-recycle and single-use plastics, improving household recycling and food scrap collections, container return schemes, product stewardship, waste disposal levies, responding to the Rethinking Plastics report, and creating a circular economy (Ōhanga āmiomio). On the site, there is information on bans put in place that businesses can reference in order to stay up to date with the current laws surrounding plastic waste. One can find information on The Waste Minimisation (Plastic and Related Products) Regulations 2022 which were issued in March 2022 and amended in November 2022. The October 2022 ban on single-use plastic drink stirrers, single-use plastic cotton buds, plastics with pro-degradant additives, certain PVC food trays and containers polystyrene takeaway food and beverage packaging, and expanded polystyrene food and beverage packaging, and more can be found, too (Aotearoa (New Zealand) Government, 2023). Similarly, they make it easy to understand, and therefore, enact.

Similarly to Australia, there was an abundance of readily available information and policies in comparison to the other countries analyzed. Not only was it very well laid out and not confusing at all, the number of policies and the action being taken was hard to miss. Of all the sites and reports provided, New Zealand's was by far the most comprehensive, educational, layered, informative, and easy to navigate. New Zealand's amount of information was presented very well, which makes it easy for the average person to come along and learn about laws, next steps, and why plans are being formed and implemented in the first place. New Zealand most definitely exhibits a green mindset based on what has been presented, and frankly, sets the bar when it comes to each of the case studies covered here. A sense of their organization can be seen in figure 7. Specifically, there is a bar on the left hand side of the site where one can navigate to different sections of the site, each one covering a separate topic all in relation to their green initiatives.

Values

As mentioned earlier, New Zealand and Australia emit <0.01% of global plastic waste to the ocean, while India created 12.92% and China, 7.22%. When it comes to mismanaged waste, (plastics that end up in landfills or incinerated) it is estimated that each citizen of India generates 9.51 kg (20.97 lbs), 8.56 kg (18.87 lbs) in China, 0.36 kg (0.79 lbs) in New Zealand, and 0.21 kg (0.46 lbs) in Australia. Based on this information, values of high, medium, or low can be assigned to how much plastic pollution is created by each country in question. Low will be assigned a value of 1, medium will be assigned a value of 2, and high will be assigned a value of 3. Next to each label of high, medium, or low will be the number value, as well, in parenthesis. Below is the scale for reference:

Figure 8
Scale of Mismanaged Waste Per Capita With Included Distinctions



Note. This is the same as Figure 2, just with the assigned values attached.

Based on the numbers provided by Our World in Data, here are the following values for each case study in regards to the independent variable:

India: medium (2)
China: medium (2)
Australia: low (1)
New Zealand: low (1)

Moving forward, based on the green mindsets each case study has exhibited via the amount and kind of policies from them, another value can be assigned for the dependent variable:

India: low (1)
China: medium (2)
Australia: high (3)
New Zealand: high (3)

Each case study was analyzed in comparison with the other in order to form a scale. Having looked over each one, India has been given a low value because of its lack of readily available information and policies in comparison to the other countries analyzed. Their information was confusing to navigate, some of it even contradicting itself, and there was a lack of explanation as to why they were making the decisions they were.

China has been given a medium value because, in comparison to India, it has more information available and policies being pushed forward, but it is still lacking in comparison to the other case studies. While there was definitely more action being taken, it was difficult to navigate. All of the information seemed to be scattered across multiple sites so it was hard to get a clear, straight answer on some things. The use of Google Translate probably made things a bit more confusing, too. Despite this, the medium value was assigned because it had more information than India.

Australia has been given a high value because of its abundance of readily available information and policies in comparison to the other countries analyzed. Australia created a pdf with a summarized version of their goals, plans, and achievements that makes it easy for the average person to navigate the current and past state of Australia's anti-plastic pollution initiatives. It was hard to miss the amount of information they had present, which not only covered what they have done and what they plan to do, but research initiatives, technology investment, and education on plastic pollution that provided specific data for their citizens and the rest of the world to look over. It did not seem at all like they were making a pdf just to do it; they were making their report because they knew how important it was. It was not thrown together, but planned out formally and efficiently. On that same note, New Zealand has also been given a high value based on the same kind of reasoning made for Australia. Their website was easy to navigate, was very clear, and had an abundance of information readily available. It was not only policy driven, but educational, as well. New Zealand's presentation of information was by far

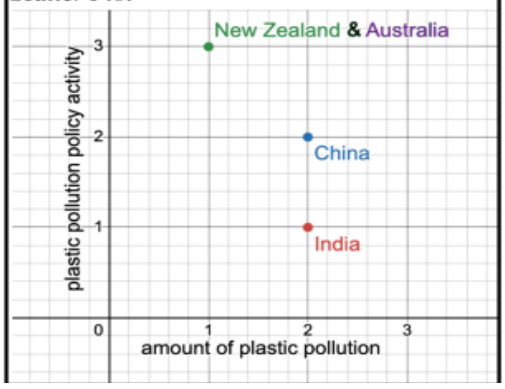
the most comprehensive, with their whole site being designated to different topics on plastic pollution. These ranged from waste strategies to priorities for investment like research and public information. The fact that they have made a point to invest in public information shows, since their site is so informative and easy to navigate. They have links provided for different funds and programs they have going on as well as plans to improve recycling and minimizing waste. They even have an email you can reach out to if you have any questions. This is a great site for anyone to reference, especially those who may run a business and need to update themselves on what kinds of policies are in place in order to run their business in accordance with new rules.

Looking at these values, we see a relationship begin to form. With each of the values assigned, we can begin to see on paper how both the independent and dependent variables interact with one another, which is explored in figure 9 in the form of a scatter plot.

Upon further inspection, it can be seen that those countries with higher amounts ofplastic pollution tend to have a lower/medium amount of anti-plastic pollution policy activity. Furthermore, the countries with a low amount of plastic pollution tend to have a higher amount of anti-plastic pollution policy activity.

Figure 9

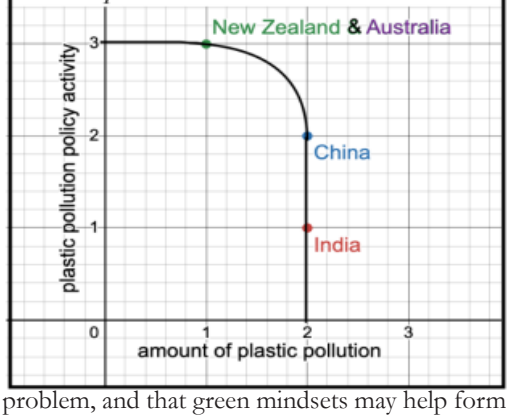
Relationship Between Policy and Pollution
Scatter Plot



An inverse relationship can be seen here that could be explained by their green mindsets, which is depicted through their anti-plastic pollution policy activity. Where the independent variable is present, there is less of the dependent variable, and vice versa. In figure 10, a line has been placed to showcase the relationship being explained. The line falls pretty sharply when the variables converge, meaning as soon as one of the variables is present, the other falls, hence, the inverse relationship. It is an interesting relationship, especially since China and India have the same independent variable value but different dependent variable values. This makes for a drastic fall on the graph, which definitely aligns with the information presented on their green mindsets and plastic pollution. These results get even more interesting, however, when it is realized Australia and New Zealand have the same plot point, which adds to why the line drops so drastically. There is not a fourth plot point to straighten out the curve. All in all, knowing that when plastic pollution is up, green mindsets go down is a very interesting conclusion. One might think that when plastic pollution is up, green mindsets would also go up in order to combat the problem of pollution, but that is not seen. When we look back to the original research puzzle that asked why promises do not seem to be kept on combating plastic pollution, this relationship would explain why. It would also explain why pollution is such a persistent problem, and that green mindsets may help form solutions, and therefore, be the solution.

Figure 10

Relationship Between Policy and Pollution
Line Graph



Conclusion

This study began with the research question,

"Why is implementation of anti-plastic pollution policies seen in some countries and not others?" In the end, it has been concluded that green mindsets may have to do with it. After looking at the past literature and revealing three schools of thought, delving deeper into the effects green mindsets may have on the research question made the most sense. From there, case studies were chosen and data gathered on each one to analyze their green mindsets and compare it with their amount of plastic pollution. It was found from this that when high levels of green behavior are exhibited through policy formation via a green mindset, lower levels of plastic pollution are found.On that same note, when low levels of green behavior is present, higher amounts of plastic pollution is. This proves that enabling and tapping into green ways of thinking and policy implementation leads to lower levels of plastic pollution. However, there are limitations to this research that cannot be ignored. For instance, while the research attempted to factor in waste that may have been exported from one country to another, this was difficult to track and was not available through most data resources. Furthermore, while steps were taken to eliminate this, like looking at oceanic plastic waste in order to choose a case study and then transitioning to mismanaged waste per capita once the case studies were located, oceanic plastic waste can, too, be affected by plastic pollution exportation or water current movement. Further research must be done in order to obtain a clearer data set. This would begin by tracking plastic movement on a global scale for years, which is already a huge endeavor on its own.

The conclusion also does not explain how money factors in, which plays a huge role in technology advancement in general, not just technological advancement in regards to combating plastic pollution. It also does not explain how the case studies that showcased having a green mindset were able to acquire that mindset in the first place. Why is it that New Zealand seems to have a more defined green mindset than India at all? Researching each case study's history and what effects that might have on the way they approach plastic pollution would be beneficial in understanding how to tap into these approaches to plastic pollution.

Based on the conclusion that was reached, though, an extension of this research could be completed by asking how well the policies outlined here worked at fighting plastic pollution. Many of the policies outlined here were from the past, present, and future, and seeing how the policies outlined for the future turn out would be very helpful in seeing how well-kept a country's promises are. There were quite a few goals set for the year 2025, especially when it came to China. Their medium score might go up to a high score if an effectiveness is seen from their policies for 2025 and they make it more accessible to the global public.

Another way this research could be continued is by analyzing other case studies. There are plenty of other countries, and therefore, plenty of other case studies to begin. If a more

in-depth graph were to be created with more than 4 plot points, another relationship may be revealed, which would be very intriguing. The relationship revealed here compares two drastic ends of the plastic pollution spectrum, two with the most plastic pollution and two with the least. Including data from case studies that do not fall on either of those ends, but somewhere in the middle, would be interesting.

In the end, the inverse relationship revealed between the independent and dependent variable is very telling. There were gaps in the previous literature that made it difficult to conclusively say in a straight-forward manner that this relationship exists, but now the qualitative analysis has been done to show that it is true, at least within the confines of this study. Future research should most certainly be done in order to not only confirm the phenomenon seen here, but take it a step further and reveal new relationships as plastic pollution continues to worsen. How humanity goes about tackling plastic pollution as a whole is yet to be seen, but breaking down what kinds of frameworks are the best at decreasing the negative impacts of the issue is nothing short of important. At the rate humanity is going with the pollution we create, it is of the utmost importance. How each country will take a stand

will dictate the future of our planet.

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