Understanding the Market Drivers Behind the Reduced Demand for Ivory Products in Japan

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Abstract

Reducing demand for wildlife products has been recognised as an important global priority. However, consumer demand is a complicated phenomenon involving numerous interacting biological and socio-economic factors, operating at a range of scales and time periods. The demand for elephant ivory is an excellent illustration of the gaps in our current knowledge. Although it is well-documented that Japan is no longer a significant destination consumer market for ivory products, we have little insight into the market drivers behind this change. This is partly because post-hoc evaluations are difficult when relying on traditional quantitative methods. We used General Elimination Methodology and semi-structured interviews with key stakeholders to understand the consumer changes in Japan. We identified the two biggest market drivers—the CITES international trade ban and economic recession—as well as a range of minor drivers and enabling conditions. These included respect for government authority, the passive nature of demand for ivory, and a general cultural shift away from conspicuous consumption. This case study highlights the role of theory-based qualitative evaluations in conservation, which recognises that specific outcomes are likely to be caused by multiple contributing factors driven by interactions between different actors.

Keywords: behaviour change, conservation social science, consumer research, demand reduction, impact evaluation, qualitative, wildlife trade

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INTRODUCTION

Wild species have a long history of being traded and used by humans, but there is increasing conservation concern about over-exploitation of vulnerable wildlife to supply commercial trade (Hughes 2003; 't Sas-Rolfes et al. 2019). As well as threatening the future of many species, illegal and/or unsustainable trade in wildlife may undermine local livelihoods, damage the

broader stability of ecosystems, and potentially contribute to the emergence of new zoonotic diseases (Rosen and Smith 2010; 't Sas-Rolfes et al. 2019). Although many trade chains are sustainable, curtailing exploitative markets is a major conservation issue (Golden et al. 2014; Challender et al. 2015).

Conservationists and policymakers can intervene at various points of the trade chain to address unsustainable trade in wildlife, including the supply of products, transactional arrangements, or consumer demand ('t Sas-Rolfes et al. 2019). With fears that there are expanding markets for certain taxa, reducing demand has been recognised as an important global priority (CITES Secretariat 2017; Esmail et al. 2020). Influencing consumer behaviour to reduce demand may be achieved by voluntary (e.g., social marketing interventions) or coercive (e.g., trade bans) means (Wyatt 2013; Felbab-Brown 2017). However, consumer demand is a complicated phenomenon. The quantity of a wildlife product demanded and the price it fetches are influenced by a range of market drivers, from legislation to motivations grounded in societal practices, such as the use of traditional medicine (Salazar et al. 2019; UNEP 2019). By examining case studies where demand has been altered, we can begin to disentangle these drivers.

The demand for elephant ivory is an excellent example of the gaps in our current knowledge. Ivory has been traded globally for centuries, and despite considerable controversy, media coverage and conservation efforts, it continues to hold significant socio-economic value (Martin 1985; Barbier et al. 1990; Martin and Stiles 2003). However, the ivory trade has caused a dramatic decline in elephant numbers in Africa and Asia, leaving many regional populations severely threatened (UNEP et al. 2013; Thouless et al. 2016). The international community responded in 1989 by banning the international trade in ivory, but legal domestic markets persist in some countries (CITES Secretariat 2017; Sakamoto 2017). This includes Japan, the largest ivory consumer country in the 1980s, which played an important role in driving the demand (Kitade and Toko 2016). However, recent analyses indicate a reduction in this consumer demand for ivory products (Kitade and Toko 2016; Kurohata 2020), which has been attributed to various market drivers, including the international trade ban, campaigns by NGOs aimed at consumers and an economic recession (Stiles et al. 2015; Kitade and Nishino 2017, 2018). This uncertainty is partly because there are no systematic studies of the multiple possible drivers and their interactions, and we lack longitudinal data on ivory purchases and consumer motivations in Japan and abroad.

This means we have limited insights into how consumer behaviour and attitudes influenced ivory sales in Japan, despite it being well-documented that Japan is no longer a significant destination consumer market for ivory products, as it was in the 1980's (Parker and Martin 1982; UNEP 2019). This is partly because post-hoc evaluations of such complex systems using quantitative methods such as synthetic counterfactuals are difficult when longitudinal data are lacking. Fortunately, theory-based approaches, which make use of programme theory or logic models as a framework for the evaluation, are well-adapted to this type of context (Stern et al. 2012), and these evaluation methods can be used to examine the assumptions underlying the causal chain from inputs to outcomes (White 2009; White and Phillips 2012). This is because they aim not just to establish whether a certain factor had an impact, but to identify the causal mechanisms that enabled outcomes, making them a methodologically rigorous alternative to traditional counterfactual experimental and quasi-experimental designs (Scriven 2008; Lemire 2010; Befani and Mayne 2014).

General Elimination Methodology is one such theory-driven post-hoc qualitative evaluation method. It has been used in several conservation contexts to substantiate causal claims (Patton 2008; Scriven 2008; Salazar et al. 2019), systematically identifying and then ruling out alternative causal explanations of observed results. Here we use General Elimination Methodology to analyse semi-structured interviews with key stakeholders and the existing literature to answer two key research questions: 1) how has the level of demand for ivory products in Japan changed since 1983; and 2) what were the market drivers behind any change? We reflect on the significance of our findings for the future of Japan's domestic ivory market, and the role of legal, economic, normative, and cultural drivers in changing demand for wildlife products over an extended time period.

Study context

Elephant ivory has been valued by consumers in Japan for over a thousand years, with records of its use dating back to the seventh century (Martin 1985). During the Edo period (1603-1868), raw ivory imports increased incrementally and the traditional ivory carving industry was established (Martin 1985; Kitade and Toko 2016). With the socio-economic development of Japan over the following 150 years, ivory use spread to a wider demographic and at its height Japan's ivory industry was one of the largest in the world (Ishihara et al. 2010; Kitade and Toko 2016). For example, between 1979 and 1989, it represented 32% of the world trade and the annual production value of ivory-related industries had an estimated worth of USD145 million (Kitade and Toko 2016).

During this period of growth, ivory was crafted into a diverse range of products (Martin 1985). Initially, the items produced were both high-end and practical in nature. For example, luxury *netsuke*, a traditional toggle on a kimono, were often intricately carved into decorative shapes (Kinoshita 2010). Use waned when the Japanese moved to more Western-styled clothing in the late nineteenth century, but they remain a collectable art piece (Martin 1985). Other products included hair accessories and combs, or parts for traditional musical instruments such as the shamisen (Kitade and Nishino 2017). However, the overall quantity of ivory carved was not very large because its high cost made it unaffordable to most people. This changed with the socio-economic boom that started in 1960 (Martin 1985). Entire tusks of ivory were used as decoration in homes, and

it became a popular material for traditional signature-seals named *hankos* (also known as *in-kans*; Ishihara et al. 2010).

Imports of raw ivory peaked in 1983 and then declined substantially. The annual production value of ivory and related industries in 2014 was 13% of what it was in 1989 (Ishihara et al. 2010; Vigne and Martin 2010; Kitade and Toko 2016; Sakamoto 2017). This resulted from a drop in both sales and prices, indicating a decline in demand. Further evidence comes from a drop in ivory association membership, an important industry practice among master carvers and traders (Sakamoto 2017), and consumer surveys that also indicate a low interest in purchasing ivory (Kitade and Toko 2016; Bergin et al. 2019). The largest share of the ivory production market in Japan is now made up of *hankos* (Kitade and Toko, 2016). Although most ivory products are now made in an industrialised process, *bachi* (musical plectrums), *netsuke* and *hankos* are still mainly produced by master carvers.

Shortly before the peak in ivory imports, Japan became a party member to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the foremost multilateral treaty regulating wildlife trade. Significant changes in legislation followed (Figure 1). In 1989, CITES enacted the ban on the international trade in elephant ivory, although Japan was permitted to receive two one-off sales of ivory, in 1999 and 2008. At the same time, the government of Japan introduced various forms of domestic legislation to regulate aspects of trade in endangered species. Control of the domestic ivory industry came under the Law for the Conservation of the Endangered Species for Wild Fauna and Flora, enacted in 1993. External actors have claimed that both the legislation and its enforcement have not been stringent enough (EIA 2015). Prior to the 1989 ban large quantities of ivory were imported to Japan, much of which was stockpiled. The exact amount of ivory currently circulating within Japan is uncertain, and loopholes in the registration of this ivory to the CITES management authority potentially provides the opportunity for fraudulent trade and import to occur (Kitade and Toko 2016; Sakamoto 2017).

METHODS

Identifying potential market drivers

The first step in General Elimination Methodology is to identify all the possible causes of the outcome of interest, which in our case is the decline in demand for ivory in Japan. To do this, we reviewed the relevant literature and noted any events, conditions or other contributing factors which were cited as having had an impact on the ivory market in Japan. As the Japanese author of this study found very few papers on the domestic ivory market published in Japanese, the full literature search was conducted in English only. We began by searching Google Scholar and Web of Knowledge using the terms, 'Japan and ivory'. As much of the research on the Japanese ivory trade appears in non-peer-reviewed literature (Calver et al. 2017), we also employed the method of 'backward citation chasing' or 'citation searching' to find additional studies or reports, using the extensive research of Kitade and Toko (2016) as a starting point. The advantage of citation searching is that it is not limited to keywords or indexing and enables one to identify parallel topics (Cooper et al. 2017). This was especially relevant to our study due to the complexity of the subject matter and the length of the time period we were interested in (Hinde and Spackman 2014). Once we had collated all the possible causes, these were refined into a list of 35 potential market drivers (Table 1). These drivers may or may not have influenced demand for other products, wildlife or otherwise, but we were only interested in their impact on ivory.

Participant sampling

We carried out an initial stakeholder analysis to identify key stakeholder groups based on the respective sectors related to the trade. The sectors Industry, Academia, Government and NGO were identified. Key informants within each sector were then identified based on the literature, internet searchers, and through snowball sampling (n = 3). A purposive sampling strategy was used to ensure representation across three variables: 1) sector, 2) trade stance, and 3) nationality (Grimble 1998; Robinson 2014). We sought stakeholders from industry, government, academia, and conservation non-government organisations (NGOs), with both pro- and anti-trade stances, and both Japanese and foreign nationals. We selected these variables as they may have potentially influenced people's interpretation of events (e.g., trade stance), and to ensure different participants had access to different knowledge and experiences (e.g., sector). Although the foreign stakeholders we interviewed had lived in Japan for many years, or had spent a large portion of their careers working on ivory markets, we also
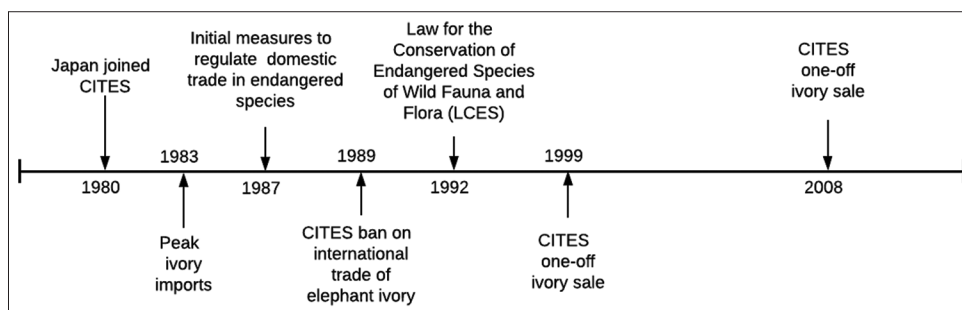

Figure 1
Timeline of important events and legislation relating to the ivory trade in Japan

Market Drivers	
CITES international trade ban of ivory	Awareness of elephant population status
Japanese economic recession	Pressure from eminent people
Unpredictable supply of ivory	Change in retail outlets
Ivory as investment commodity	Market shift to online outlets
Demand reduction campaigns	Marketing from ivory industry
CITES 1999 one-off sale of ivory	Fashion trends
CITES 2008 one-off sale of ivory	Awareness of animal welfare
Negative national media attention	Popularity of ivory
Negative international media attention	Tradition of ivory embodying good luck
Awareness of illegal wildlife trade	International demand for ivory
Awareness of elephant poaching crisis	Legacy of historical traditional of use of ivory
Demographic changes in Japan	Japan's involvement with CITES
Substitute material for ivory	Digitalisation of paperwork
Introduction of law on domestic trade	Government's involvement in ivory industry
Luxury/prestige status symbol of ivory products	Change in international socio-economic climate
Change in law enforcement of international trade	Unknown quantity of domestic ivory stockpile
Pressure from conservation NGOs on government	Change in law enforcement of domestic trade
Ivory as a traditional gift	

tracked nationality to ensure a majority of those we interviewed were native Japanese people. Trade stance was evaluated based on public statements, the position of the organisation they work for, and published papers. Participants with experience of, or active involvement in, the Japanese ivory trade were recruited in an iterative process throughout the study until theoretical saturation was reached; that is additional interviews did not present any additional themes and categories (Thomson 2011).

Interview process

We used a semi-structured interview process to reduce interviewer influence (Newing et al. 2010), the guide for which is available in the Supporting Information (SI 1). This question sheet was piloted with two volunteers prior to use. The initial section of the interview covered personal information and professional expertise. The first research question asked interviewees about consumer demand for ivory in Japan in 1983, consumer demand presently, and whether there had been a change in consumer demand. Interviewees were encouraged to speak freely about their understanding of demand and the situation of the ivory industry in Japan over that time period. To answer the second research question, we provided interviewees with a question sheet listing the 35 potential market drivers identified previously. Interviewees were asked to systematically go through this list and state whether they thought each market driver had had an impact on consumer demand. They were able to answer 'Yes', 'No' or 'Unsure', and explained the direction of a causal impact in discussion with the interviewer. They were also asked to list any additional drivers that had not been included.

Interviews were conducted over phone (n = 4), Skype (n = 15), and in person (n = 11). An interpreter who spoke both English and Japanese fluently assisted with three interviews, but the rest were conducted in English by one of the authors.

All interviews were recorded, and then transcribed using the online transcription service Temi (www.temi.com), with manual corrections. We obtained informed consent from all interviewees. They were provided with an information sheet and signed a consent form prior to participation in the study. This research was approved by the Imperial College Research Ethics Committee (2018–01416450–MORKEL-Bvdb) and the University of Kent Research Ethics Advisory Group (14-PGR-18/19).

Data analysis

Our theoretical approach was primarily inductive, in which detailed readings are used to derive themes through interpretations made from the raw data, but it was aided by abductive inference (Charmaz 2000; Elo and Kyngäs 2008; Adu 2019). In other words, we moved back and forth between the data and pre-existing theories in the literature (e.g., Ishihara et al. 2010; Vigne and Martin 2010; Kitade and Toko 2016; Kitade 2017), making comparisons and interpretations to find explanations for changes in demand (Thornberg 2012).

We analysed the transcripts concurrent to data collection and did not predefine the coding framework. Instead, it emerged in an iterative process, as we cycled repeatedly between reading, focused coding, reflection, and rereading (Adu 2019; Tie et al. 2019). We identified relevant information in the transcripts on a line-by-line basis and generated new codes and categories as our understanding evolved. The codebook we developed is available in the Supplementary Information (SI 2). All final coding was conducted by a single author (LTW) in NVivo 12 Pro (QSR International), but a large subset of interviews (n = 17) were independently coded by a second author (BM) and a qualitative consensus was reached through discussion and comparison.

We tallied the proportion of each stakeholder group (e.g., whether NGO or anti-trade) who selected 'Yes' when

asked whether a specific market driver had impacted consumer demand. This question sheet data allowed us to consider whether there were clear differences between stakeholder groups in the importance they placed on different market drivers. When ratings given by stakeholder groups differed, we used the qualitative data in the coded transcripts to help us understand why perceptions differed.

General Elimination Methodology process

Based on the analysis of the stakeholder interviews and data gathered from the literature review, we compiled a list of possible causes for the reduction in demand. We then constructed potential causal pathways for each of these possible causes, listing the events and enabling conditions that would need to be present for the cause to have an effect (Scriven 2008; Figure 2). Once these potential mechanisms were established, we assessed the absence or presence of the factors deemed necessary for each possible cause to impact demand. We qualitatively measured the strength of the evidence available for each cause from weak to strong, based upon the number of different interviewees/stakeholders groups mentioning a given driver and the reasoning supplied. Where intervening mechanisms were absent, we eliminated the possible cause from our evaluation. We refined the remaining causes into an overall theory of change, assessing the likely impact of each one to identify the major and minor drivers of change with a complex contribution analysis.
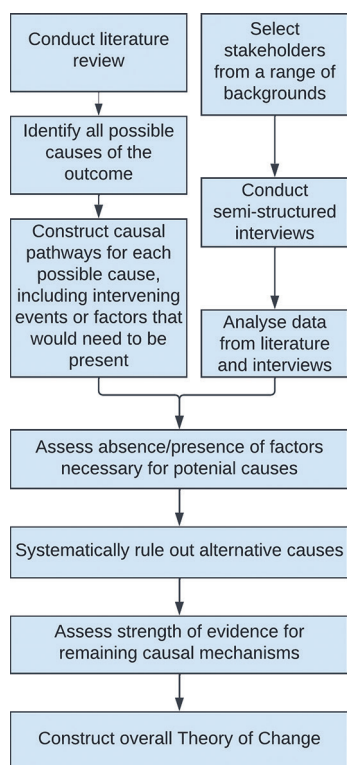

Figure 2
Pathway used for applying General Elimination Methodology in this study

The evaluation method we used—General Elimination Methodology—relies on the perspectives of a diverse array of stakeholder groups with specific relevant expertise, rather than a large number of individuals who have limited knowledge or experience of the target phenomenon. When multiple interviewees from different stakeholder groups support a potential causal explanation for the outcome of interest, our confidence in it is increased. When there is disagreement, we assess the coherence of the reasoning supplied by interviewees and the existing literature and data to judge the likelihood of impact. For this reason, overall sample size has limited importance, beyond ensuring that the key perspectives around an intervention are being adequately represented. What is critical is the diversity of expertise included in the study, and continued sampling until theoretical saturation of coding has been reached.

RESULTS

We interviewed 32 stakeholders between June 2018 and January 2020. As one interview session encompassed three members from the same organisation, this equalled 30 interviews in total. Interviews averaged 66 minutes in length and ranged from 38 minutes to 111 minutes. Respondents were generally pro- or anti-trade, few were neutral (Table 2; SI 3). Representatives from two major government departments agreed to be interviewed about the ivory trade, as did members of the *netsuke* and *hanko* industries. We were able to interview NGO staff who had been campaigning on Japan's ivory market for over 20 years, and academics with research expertise in both the domestic and international trade. More than half of those we interviewed were Japanese, and many had lived through the events discussed below.

Change in demand

Our first key research question was to investigate whether there had indeed been a reduction in demand for ivory products, as suggested by many sources and the available data (Kitade and Toko 2016; Kurohata 2020). Consumer demand reflects the quantity of ivory that consumers are willing to purchase at specific price points, so a reduction in demand means consumers are willing to buy fewer ivory products at every price point. Market surveys conducted by TRAFFIC show a reduction in the availability and sale of a variety of ivory products, both legally and illegally (Kitade and Nishino 2018). In addition, the price of worked ivory has decreased since the CITES ban (Kurohata 2020). The interview data were in accordance with the available quantitative data. Respondents were nearly unanimous that demand had declined, for all products.

> However we're not buying as much ivory volumes compared to the eighties. […] The demand has diminished. There'd been a reduction from 80% demand in the eighties when there was a conscious culture discriminating against individuals that didn't use ivory stamps versus the 10%

Table 2
Key characteristics of stakeholder respondents, including their trade stance, nationality, and sector

Participant	Trade Stance	Nationality	Sector
R02	Neutral	Japanese	Government
R05	Pro	Japanese	Industry
R06	Pro	Japanese	Industry
R07	Pro	Japanese	Industry
R08	Anti	Japanese	NGO
R10	Anti	Japanese	NGO
R11	Anti	Japanese	NGO
R12	Anti	Foreign	NGO
R13	Anti	Japanese	NGO
R16	Anti	Foreign	Academia
R17	Anti	Foreign	NGO
R19	Anti	Foreign	NGO
R20	Anti	Foreign	Academia
R21	Pro	Foreign	Academia
R22	Anti	Foreign	Academia
R23	Anti	Foreign	NGO
R24	Anti	Japanese	NGO
R25	Anti	Japanese	NGO
R26	Anti	Foreign	NGO
R31	Pro	Japanese	Academia
R32	Pro	Japanese	Industry
R34	Anti	Foreign	Academia
R35	Anti	Foreign	NGO
R36	Pro	Japanese	Academia
R37	Anti	Foreign	NGO
R39	Anti	Japanese	Academia
R40	Pro	Japanese	Industry
R44	Pro	Foreign	Academia
R46	Pro	Japanese	Academia
R49	Pro	Foreign	Academia
R51	Neutral	Japanese	Government
R53	Neutral	Japanese	Government

of the population still purchasing ivory products presently (R11, Japanese, NGO, anti-trade, 2018).

The change in demand since 1983 has not been entirely uniform. There are some niche consumer bases which maintain a certain level of demand. For example, older generations value the ivory products they possess, but have little desire to purchase more except as an occasional luxury.

> These older people probably do value and treasure their ivory products, such as ornaments for display; so they'd look after it, and keep it, and I don't think they'd really consider getting a new one… Maybe for elderlies that are living primarily on pension, they might just treat themselves to an ivory-made *inkan* as a luxury product or something (R02, Japanese, Government, neutral to trade, 2018).

Mapping possible causes

The different factors that may have led to a reduction in demand for ivory products fell into four thematic areas: 1) economic, 2) legal, 3) normative, and 4) cultural.

These causes evolved beyond the potential market drivers identified at the beginning of the study, as a detailed analysis of the data transformed our understanding of the causal pathways. In addition, we separated out the factors that were likely to increase the demand for ivory products, such as marketing campaigns from the ivory industry (SI 4). Although some were important market drivers, they failed to counteract the prevailing conditions that led to a reduction.

Economic

Based on the literature review and interview data, we identified a range of possible causes within the economic sphere that could have led to a reduction in demand for ivory products. These included an economic recession, changes in retail outlets, and the availability of substitute materials (Figure 3). Following an economic bubble, Japan experienced a severe recession that started in the early-1990s (Powell 2002; Siddiqui 2009). Respondents strongly agreed that this had far-reaching implications, including a general cultural shift away from conspicuous consumption (Ciniselli 2013). Consumers had less discretionary funds for large, expensive ivory products, but they also generally had less desire to make those types of purchases, as the status associated with gratuitous displays of wealth waned. In a reinforcing fashion, as fewer people were seen purchasing and using ivory products, social norms around their use changed.

> The economic recession impacts the majority of consumer's ability and willingness to spend on goods and services, especially luxury goods and services (R19, Foreign, NGO, anti-trade, 2018).

> So basically you get into a situation where once the bubble bursts, people want to buy it less. You're not going to have people who already have ivory who are buying it. Again, it's new people coming in, younger generations coming in who have less money, who see older generations buy ivory *hankos*, but they don't have the money to get that, nor do they see sort of that as being fashionable. So I personally think that, I mean sort of knowing Japanese mentality as well, I think that, it was quite a bad thing to kind of flaunt your wealth. There was a massive contrast between the eighties and the nineties in Japan in terms of that sentiment (R31, Japanese, Academia, pro-trade, 2020).

Since the 1980s, retail outlets for ivory changed substantially, including a shift to e-commerce platforms and decisions by many brick-and-mortar stores to stop stocking ivory products (Kitade and Toko 2016; Japan Times 2018; WildAid 2019). The growing availability of ivory online may have had mixed effects on demand, and respondents expressed uncertainty about this driver (Figure 3). E-commerce could have made it easier to buy ivory products and minimised any potential stigma from face-to-face purchasing. However, this would mainly have applied to planned purchases, rather than impulse buys while browsing in brick-and-mortar stores. Some respondents
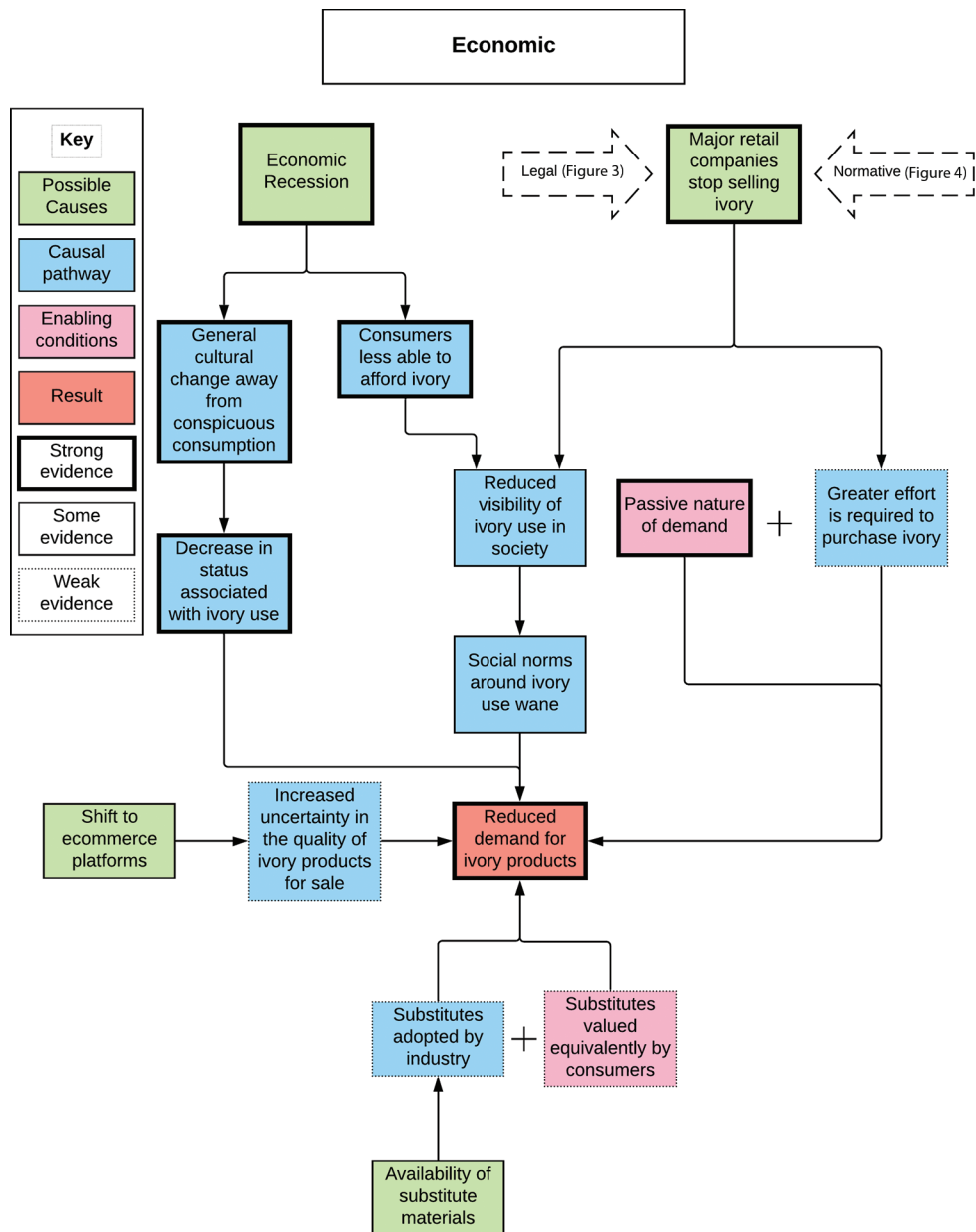
Figure 3
Theory of change for economic factors that could potentially have led to a reduction in demand for ivory products in Japan

suggested that the possibility of being defrauded may have dampened demand for ivory products, though there was little evidence to show this was a major concern.

Online marketing hasn't increased the number of consumers compared to the eighties when there were more consumers. However, the potential access to ivory is much larger and thus the potential purchase demand could increase as a result of online marketing. As opposed to you having to go all the way to a shop, you can just purchase online, which is a shorter span between the time that you decide to buy and point of sale (R11, Japanese, NGO, anti-trade, 2018).

Major retail stores such as Aeon and Ito-Yokado have stopped selling ivory products, and even online e-commerce giants such as Rakuten Ichiba and Yahoo Shopping have already followed or pledged to do so (Japan Times 2018; WildAid 2019). These decisions were spurred on by factors such as the confusing bureaucracy imposed by the domestic legislation and pressure from those opposed to the ivory trade (both explored further in this article). Reduced availability in major stores would have increased the effort needed to acquire ivory. It will also have reduced the visibility of ivory use in society generally, and thus social norms. Respondents characterised consumer demand for certain ivory products, e.g., accessories, as passive (Figure 3). Browsing shoppers may have bought ivory products that were on display, but most consumers lacked the motivation to make a special effort to find them. Although participants did not explicitly distinguish

between recreational buyers and professional collectors, this characterisation suggests recreational buying.

> Items, products such as accessories, made by ivory have become less and less popular in the stores and they've been replaced with other materials, accessories made from other materials. And people would buy those ones. They don't care so much about ivory. If such articles are not sold in the stores, people just give up, then they don't care so much about buying ivory (R08, Japanese, NGO, anti-trade, 2020).

Depending on its purpose, there is a range of other materials that can be carved in the place of ivory. These include but are not limited to titanium, crystal, buffalo horn, plastic, mammoth ivory, and woods such as mahogany or boxwood. They vary in terms of price, status, and durability. Whether they are accepted by businesses and customers as alternatives to ivory depends on the specific product. For instance, respondents were firm that ivory is considered to be the best material for *bachi* (large plectrums) for *shamisens*, a traditional Japanese musical instrument. This usage accounts for only a small portion of the market, however.

> Yes, but I've heard that instrument plucks have to be ivories. They've tried using alternatives, but it just breaks apart. The *shamisen* plucks (R05, Japanese, Industry, pro-trade, 2018).

Laser-engraved titanium *hankos* occupy a similar price and prestige bracket to hand-carved ivory *hankos*, but the smaller, traditional businesses may have been unable and/or unwilling to invest in the needed equipment to provide them (Figure 3). *Netsuke* carvers show a greater willingness to use alternative materials such as boxwood, even if ivory is still desirable. "One thing I would like to add is that, of course, I understand the value of ivory, and the problems. And netsuke is not just about ivory. And even if there won't be ivory anymore, I will continue to make netsuke from other materials," informed R40 (Japanese, Industry, pro-trade, 2020).

Legal

Both international and national legislation had the potential to impact ivory demand (Figure 4). The CITES international trade ban was a major driver that came up repeatedly. The government did eventually enforce the import ban, and a culture of respect for government authority affected public perception of ivory use. Deference to political authority as a core value in Japan has been established in the literature, and it also emerged from our analysis of the data (Zhai 2017). How this implicit trust in the government impacted demand for ivory overall is not clear cut however, and some respondents thought consumers could have interpreted the presence of legal products in stores as a governmental endorsement of the trade.

> The CITES international trade ban of ivory. I think that definitely had an impact. I would say Japanese people are quite orderly. [...] There's a certain level to which the law is held in regard to, and I think in Japan it's quite, it's quite strict. You'll see that in drug use for example. There is drug use in Japan, but it's so shunned upon. So there's quite,

the public perception of the law is quite strong. So I think, yeah, the international trade of ivory ban was definitely influential (R31, Japanese, Academia, pro-trade, 2020).

Pressure from the international community helped prompt the enactment of national laws regulating the domestic ivory market, and later amendments which further strengthened this legislation (Mak and Song 2018; Sand 2018). The confusing bureaucracy imposed by the domestic legislation has been criticised, with some members of the conservation community concerned about loopholes (Environmental Investigation Agency 2015), but it likely contributed to the decision made by many large retailers to stop stocking ivory products. In this way it may have been partially responsible for reducing the availability of ivory in the market, which could have lessened consumption due to the passive nature of demand (Figure 4). However, it is also possible that seeing registered ivory items available for sale reinforced consumer trust.

> About regulations, and involvement of government. I think it's not directly affected purchasers' demand, but I think it does affect or change the behaviour of people in the ivory industry or shoppers, so involvement of governments in the dissemination of regulations will change their behaviour, and it may change the retail outlets. So it will affect. But again, in this case, it may increase or decrease demand. Both is possible (R46, Japanese, Academia, pro-trade, 2020).

Normative

Consumers of ivory may have been influenced by a range of sources, including NGOs, the media, and eminent people (Figure 5). NGOs aimed to change behaviour by increasing the public's awareness of the trade and empathy towards elephants. If consumers had developed negative attitudes towards the illegal wildlife trade in ivory and believed that the ivory market in Japan contributed to elephant poaching, then they may have decided to boycott its products. However, despite frequent media coverage, respondents were only aware of a small number of concerted demand-reduction campaigns aimed at ivory consumption. Some respondents thought it was very likely that NGO campaigns combined with media coverage of the ivory trade did improve consumer knowledge, but there is little evidence that this led directly to behaviour change. NGOs did however successfully exert pressure on several retail giants to change their policies regarding ivory, which could have had indirect impacts by reducing the visibility and availability of ivory products.

> Firstly, those kinds of international negative campaign affected a lot on big department stores in Japan at that time. So it becomes more and more difficult for them to sell ivory products because it's a kind of shame to be selling those kinds of things. Automatically the market has been shrunk (R16, Foreign, Academia, anti-trade, 2018).

Most Japanese people only follow national media outlets, so respondents considered the extensive international media coverage on the ivory trade unlikely to have impacted consumers directly (Newman et al. 2020). National media
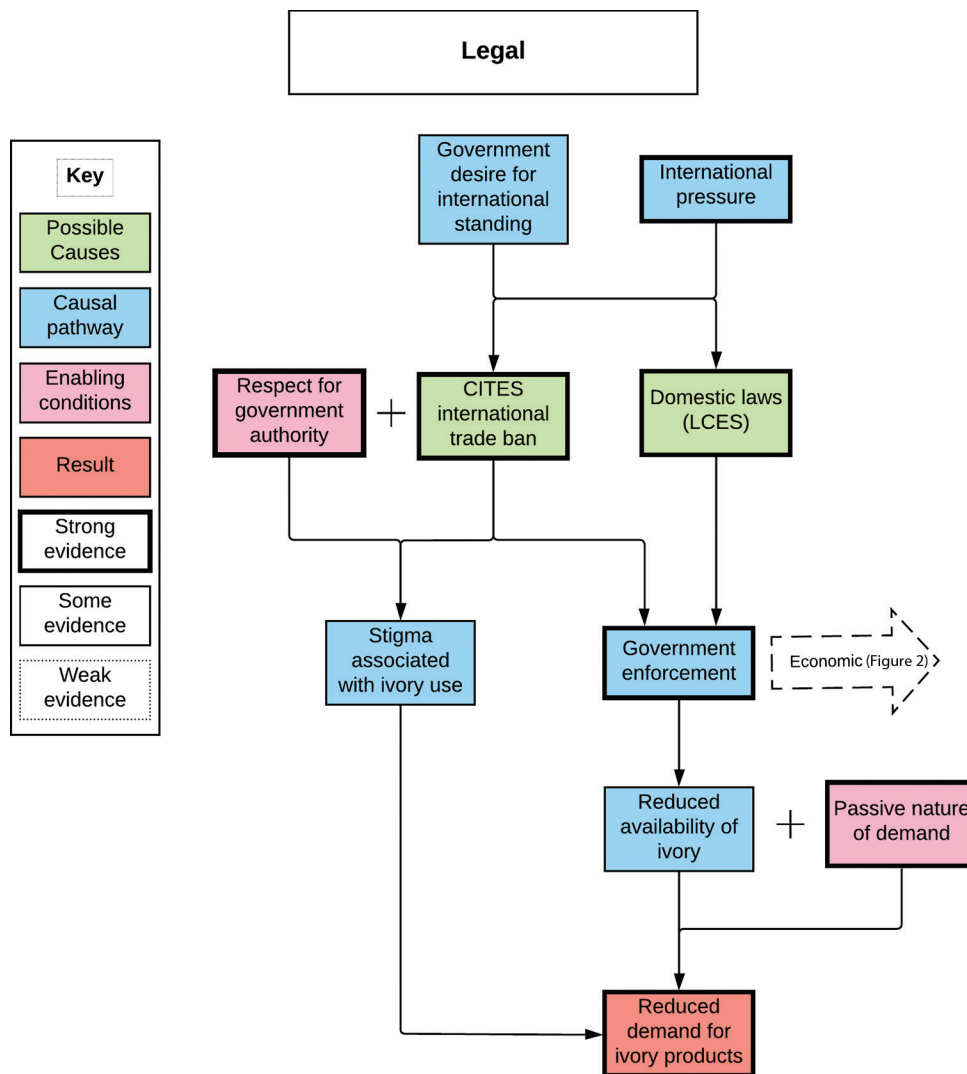
Figure 4

Theory of change for legal factors that could potentially have led to a reduction in demand for ivory products in Japan

often pick up stories from international outlets however, and there has been extensive and frequently emotive reporting, particularly in the years following the CITES trade ban. There is a large degree of uncertainty associated with the impact of this media coverage on consumers. Respondents thought that audience segments may have been differentially affected. Amongst those more susceptible to this coverage were younger generations, policymakers, and those who were already uninterested in purchasing ivory products.

> I think yes; I'm not sure about the degree of impact, but I do think there will be people [who are] exposed to the media and feel that they shouldn't purchase it. Whether these people wanted it in the first place is another issue. They may not have had any interest, but they'll be aware of it from the news (R02, Japanese, Government, neutral to trade, 2018).
>
> So it may be because in Japanese society, I think they primarily get their news from Japanese language media, not necessarily English language media. So if you're talking

about influencing an individual Japanese consumers, I don't think that has played a factor in influencing consumers, but if you are teasing them out [different stakeholder groups], say policy makers in Japan, I think then negative international media attention has an influence on policy makers, but not on consumers (R19, Foreign, NGO, anti-trade, 2018).

Studies have shown that people may emulate the behaviour of celebrities, including eschewing certain products such as meat, but the impact of celebrity endorsers in conservation is not clear-cut (Cheng et al. 2007; Duthie et al. 2017; Phua et al. 2019). In this case, we found there was little evidence that eminent people in Japan chose to take the spotlight to pressure consumers to boycott ivory (Figure 5). One exception was a visit by HRH Prince Philip where he openly spoke out against ivory consumption while meeting with the prime minister (Kitade and Toko 2016). Few respondents considered this significant, although one felt it may have had an impact on policymakers who were concerned about Japan's international reputation.
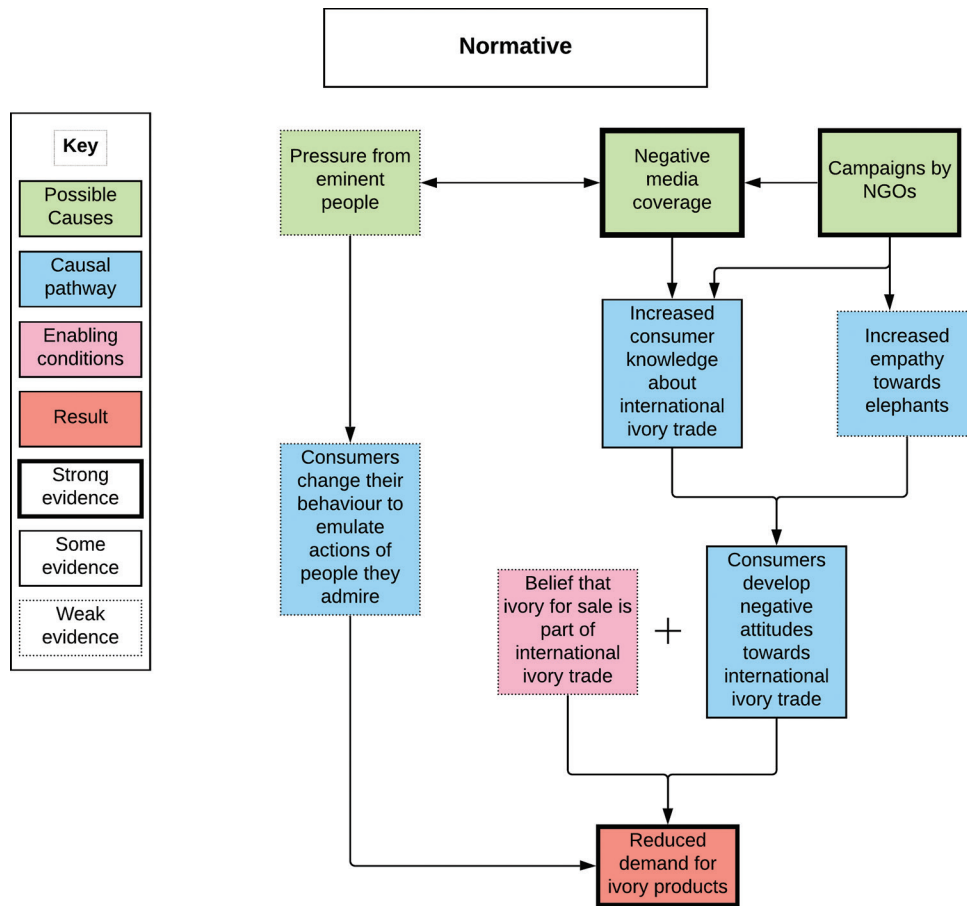
Figure 5
Theory of change for normative factors that could potentially have led to a reduction in demand for ivory products in Japan

Cultural

Over the past four decades many aspects of Japan's society have changed (Figure 6). Between 1970 and 2005 there was a steep decline in Japan's birth-rate, leading to a progressively ageing population. This demographic decline has been linked to a decrease in consumption generally, and respondents also associated it with reduced demand for specific ivory products (Ciniselli 2013). For instance, *hankos* are a standard "coming-of-age" gift that older relatives may give to young adults, and ivory has often been promoted as a desirable material. As the number of people in each generation decreased, the quantity of *hankos* needed could also have decreased. However, respondents were unsure whether this change in itself would have been enough to lead to a decrease in ivory *hanko* sales.

> When I check the sales strategy of *hanko* retailers one of their main targets [are] parents or relatives or the young people who are becoming adult[s]. They promote ivory *hanko* to the parents and relatives to gift this to your children for becoming [an] adult. It's a kind of high prestige, *hanko* may ascertain the future of the children, or something like that (R10, Japanese, NGO, anti-trade, 2018).

> I think one of the things is just the demographic change [that influenced change of demand] because the *hankos* were

basically given to young men when they reached a certain age as part of a rite of passage. Now because of Japan's ageing population and low reproductive growth rate, the cohorts coming through to give the *hankos* to have dropped because of a demographic shift. Traditional demand, the traditional gift, it's just rapidly becoming less and less popular—one strong factor (R44, Foreign, Academia, pro-trade, 2018).

Another factor that could have lessened the need for *hankos* is the digitisation of paperwork. If physical signatures were no longer required for day-to-day business activities or major purchases like buying a car, then the average consumer would have no practical need for *hankos* and the entire culture of use could be lost. At the time of interviewing, respondents thought it was unlikely that digital signatures had become commonplace enough for them to have had a major impact on *hanko* sales (Figure 6). However, since the SARS-COV-2 pandemic, there have been reports of a much larger shift towards electronic signatures (Reynolds 2020; Ryall 2020).

> I think that with the *in-kan*'s [*hankos*], their demand is definitely affected. When more people use online methods, there is less of a need to stamp seals using *in-kan*'s. So, although it's not limited to those made of ivories in particular, but *in-kan*'s in general, I feel like their
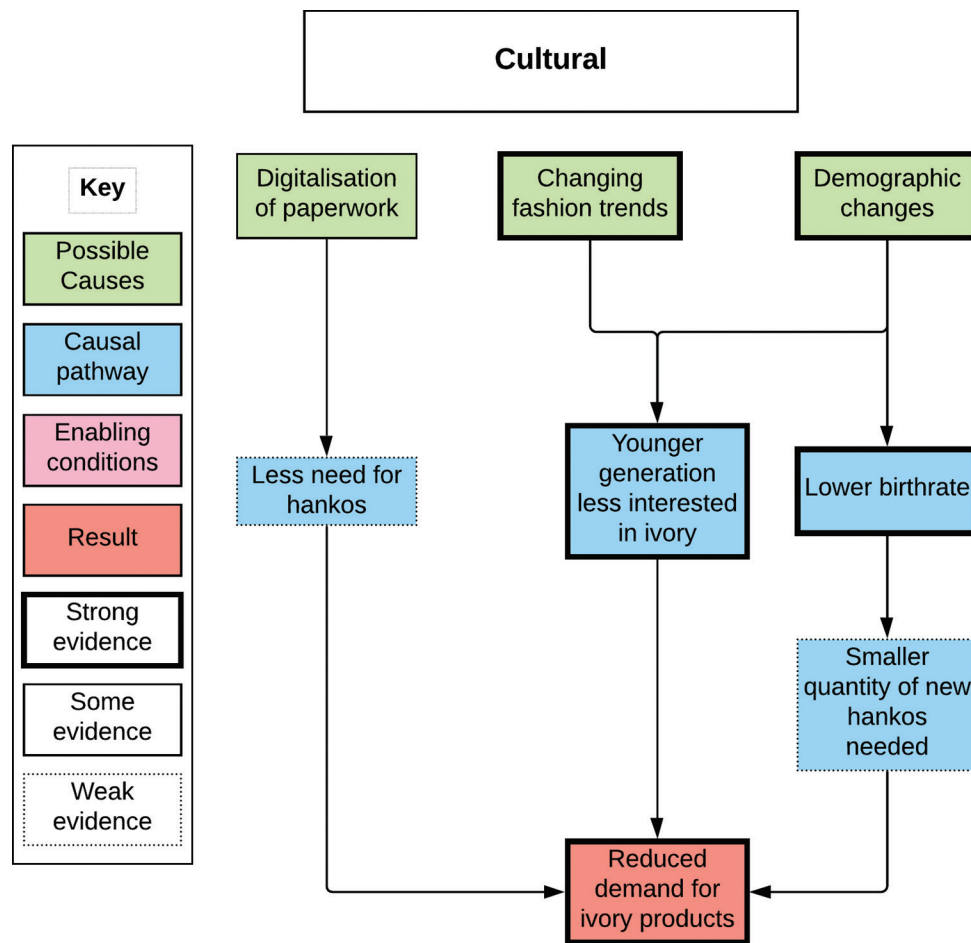
Figure 6
Theory of change for cultural factors that could potentially have led to a reduction in demand for ivory products in Japan

significance will begin to die out, and potentially even the art of carving *in-kan*'s may be lost together too (R02, Japanese, Government, neutral to trade, 2018).

A common theme emerged that, as well as being fewer in number, the younger generations had less interest in ivory products. This was mainly attributed to changing fashion trends, and a greater awareness of the plight of elephants in the illegal ivory trade (Figures 5 and 6). While the other factors explored in this research article may also have impacted the reduced popularity of ivory accessories amongst younger consumers, some respondents believed that was just a reflection of the cyclical nature of generational preferences. Geographic differences between urban and rural populations are also a potential factor, but none of the stakeholders highlighted this as a driver of ivory demand. "The senior population contributes more strongly to the market demand for ivory. The younger population might be future ivory consumers. However, the immediate demand for ivory belongs primarily to the people above fifty years of age" (R05, Japanese, Industry, pro-trade, 2018).

And, for people who know anything about ivories, whether it be young people, the issue is that when young people are seen wearing accessories made of ivory, it doesn't leave a very good impression; as in, its treated in a similar way as animal fur clothing (R36, Japanese, Academia, pro-trade, 2018).

Overall theory of change

Markets are complex systems, and it is important to recognise that the reduction of demand for ivory products was caused by multiple, interacting factors (Figure 7). Based on our analysis, the two biggest drivers were the CITES international trade ban and the economic recession. When coupled with respect for government authority, the passive nature of demand, and a general cultural shift away from conspicuous consumption, we see profound effects on demand for ivory products in Japan. Without these enabling conditions, interventions such as the CITES trade ban may have failed to impact consumer demand, and instead led to a thriving black-market trade like we see in other countries (Gao and Clark 2014).

They're very fashionable in the eighties and then with the recession combined with the CITES ban, combined with the interest in emulating the west, we see that ivory had gone out of fashion. It's a combination of factors all happening at the same time (R20, Foreign, Academia, anti-trade, 2018). Around that time, the average price for ivory made stamps began increasing. This was further exacerbated around the

time period that you've just mentioned—around the late-1980's when the imports of ivories were banned. This meant that the business had to run on what was currently in the domestic stockpile, so it was this resource scarcity that drove up the prices which ultimately lead to the final stamps at retail stores becoming more expensive. This, in combination with the falling Japanese economy caused the demand to decline (R32, Japanese, Industry, pro-trade, 2018).

While we cannot quantify precisely the impact of different market drivers, other factors likely had comparatively smaller or more indirect effects (Figure 7). Pressure from the media and NGOs may have changed the perceptions of at least some consumer segments, and also influenced major retailers. This is also the case for the enforcement of national legislation.

Yes, of course! Because at that time it was everywhere in newspapers. The consumers themselves are also aware. They must have felt like they were ashamed of buying this kind of thing. So in the beginning they thought is a kind of status of wealth but after negative way international media campaign, they started to feel ashamed of buying such kind of things (R16, Foreign, Academia, anti-trade, 2018).

DISCUSSION

We have been able to tease out the varying drivers that have impacted demand for ivory in Japan over the past 35 years by rigorously and systematically applying General Elimination Methodology. We identified the two biggest drivers, the CITES
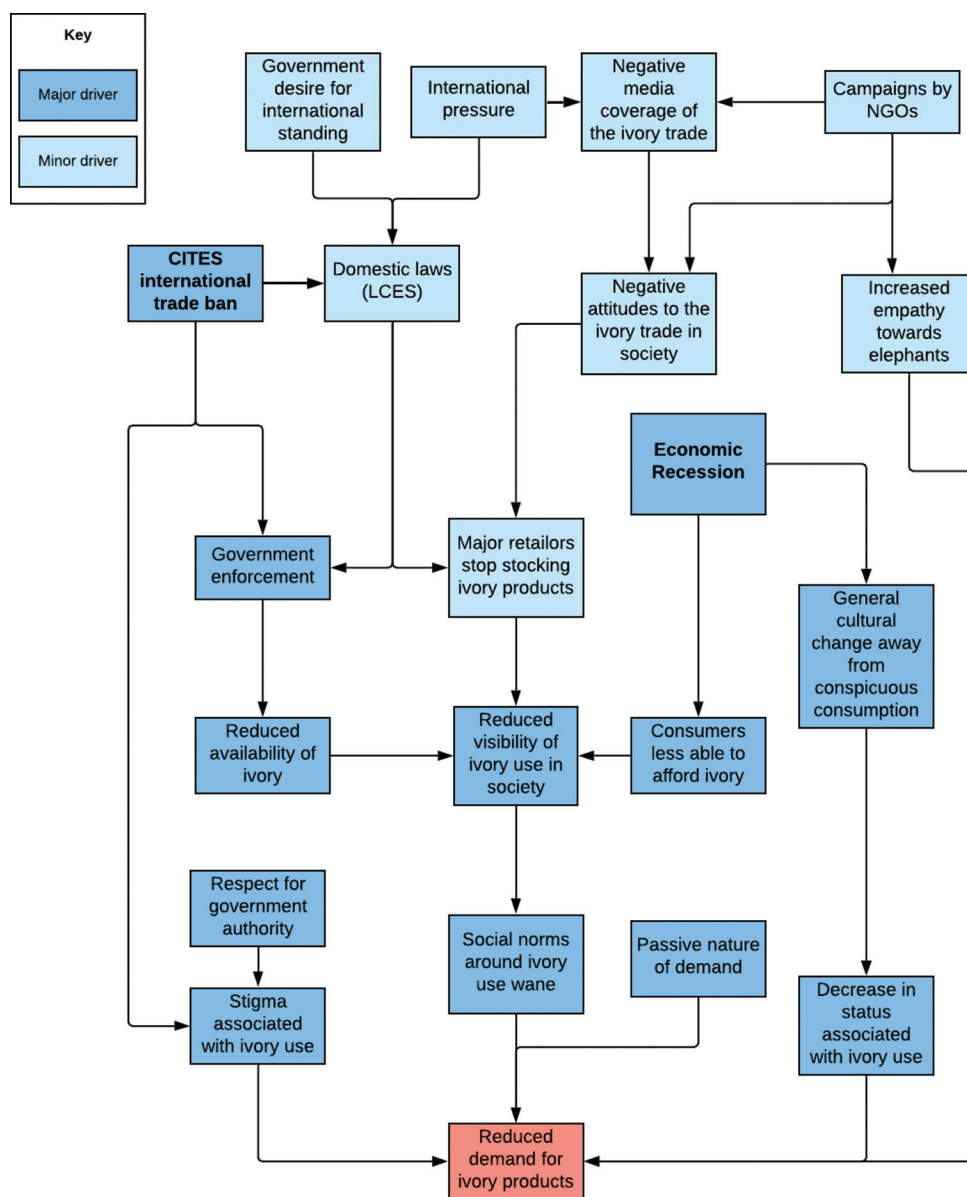

Figure 7
Overall theory of change, illustrating the major and minor drivers that led to reduced demand for ivory products in Japan

international trade ban and the economic recession, as well as a range of minor drivers and enabling conditions. Purported influences that are unlikely to have had an impact, such as pressure from eminent people, have been ruled out.

One important finding is the lack of evidence that concerted campaigns directly affected consumer demand. Conservationists and policymakers are increasingly interested in demand-side interventions that focus on shifting individual behaviour through approaches such as social marketing and environmental education programs (Veríssimo and Wan 2018). The consumer-facing interventions in Japan tended to be awareness-raising campaigns using mass media, an approach that is unlikely to directly persuade consumers to change their behaviour (Kelly and Barker 2016; Greenfield and Veríssimo 2018). Instead, these campaigns indirectly contributed to a reduction in demand by placing pressure on major retailers to stop stocking ivory products, which reduced the visibility of ivory usage in society.

Differences between stakeholder groups

Given the importance of diverse perspectives for the analytical method we used, General Elimination Methodology, the limited number of stakeholders from certain backgrounds, e.g., only three from the government, should be acknowledged when interpreting the results. Industry stakeholders were especially difficult to recruit, due to previous poor experiences with interview requests from foreign media. However, there were few significant differences between respondents' perceptions of the factors affecting consumer demand for ivory, including between Japanese and foreign stakeholders. Considering attitudes towards the ivory trade are often strongly-held and diametrically-opposed (pro versus anti-trade; Biggs et al. 2017), this consensus suggests we can be confident in our analysis. Where opinions did differ, the disagreement was often qualitative in nature, e.g., the level of importance that should be ascribed to a specific driver. One factor about which stakeholder groups did disagree was media coverage. Industry members felt there had been far more negative media coverage and NGO campaigns, and that these did change consumer behaviour. This may be because the coverage was more salient to these stakeholders, who belonged to the very trade it attacked. Academics, policymakers, and industry members also felt that the media had misrepresented Japan's ivory market and its impact on elephants, a concern not shared by NGO representatives.

> I feel that the way these groups release information about illegal trade or animal treatment using traps and such is almost problematic on a legal level. On top of this, the media portrays it in such a skewed way. It just seems to claim that ivories are bad (R32, Japanese, Industry, pro-trade, 2018).

Respondents who held pro-trade attitudes were more likely to emphasise the importance of shifting fashion trends and changes in retail outlets, both physical and digital. Anti-trade respondents focused relatively more on factors that could be driving demand, such as the tradition of historical use and the status associated with ivory. They also thought that substitute materials and the implementation of the CITES trade ban played a bigger role in reducing consumer demand than did the pro-trade respondents.

The future of Japan's domestic ivory market

Although there has been an overall reduction in demand for ivory products, there were several counteracting forces (SI 4). One important factor is support from the Japanese government, who are lobbied by the ivory industry and a small sector of the population to support the trade as an important cultural and economic product. The government is also resistant to letting national policy be dictated by foreign bodies. At the CITES CoP17 meeting, a Resolution was proposed that recommended the closure of domestic markets that are "contributing to poaching or illegal trade" (CITES Secretariat 2017). Japan has firmly maintained that its domestic market does not fit this description, holding the stance that commercial trade, when carried out at sustainable levels, may help fund anti-poaching efforts and community-based conservation (Japan 2016). There is little evidence that elephants are currently being poached to supply the domestic trade, with few seizure records for imported ivory. Instead, "new" ivory entering the market tends to be whole ivory tusks, once used for decoration by older consumers, now being registered for sale with the government as they are inherited by family members who no longer consider them desirable (Ministry of Environment 2018). This large quantity of stockpiled ivory, together with the low levels of demand, means that Japan is unlikely to close the domestic ivory market any time soon.

> Yes. I think the general idea is that we don't want to entirely close down the market, so we're tightening the regulations, and lawfully carrying out procedures. We don't want to see illegal trades or the killing of elephants. By doing things under the law, we can continue ensuring this doesn't happen. This time we've amended the law, making it stricter than before, so we'd like to appeal to the public that things are carried out under proper management. Basically, ensuring that there is nothing bad coming in or going out of the country, and ultimately I don't think we're heading in the direction towards closing down the market at all (R02, Japanese, Government, neutral to trade, 2018).

The continued existence of a domestic market does not seem to pose a conservation concern. However, the contravention of CITES through illegal exports of stockpiled ivory, particularly by Chinese tourists, may provoke condemnation from many in the international conservation community, providing a case for strong domestic regulatory enforcement. If Japan wants to avoid further international criticism, there is an urgent need to tighten customs security.

> So that means for Chinese going overseas to where they can buy ivory illegally, the Chinese currency goes so much further. And so if they go to Japan, the ivory prices in Japan remain low, much lower compared with China. And then if

they buy that ivory and smuggle it back to China and sell it on China's market in RMB, the profit margin was huge. So that has created during that period, there has been quite a few large cases of ivory being smuggled from Japan to China and caught by, actually over a hundred cases, of this kind of smuggling ivory from Japan to China caught China's enforcement, none of them was caught by Japan. None (R35, Foreign, NGO, anti-trade, 2018).

Lessons from this study may also apply to other wildlife trades with similar motivational drivers in Japan, such as ornamental *bekko* (turtle shell) or timber (Thomas-Walters et al. 2020a). Japan is one of the top importers and exporters of wildlife products for use in ornaments and jewellery (Alexandra et al. 2021). Understanding market drivers that have helped to reduce demand for ivory could help design interventions to combat any trade that is of conservation concern in the same context (Thomas-Walters et al. 2020b). For example, if demand is passive then campaigns that pressure retailers to stop stocking a wildlife product may be very effective. Moreover, conservation researchers and practitioners ought to track wider market changes to anticipate any potential impact on specific trades, as in the case of Japan's economic recession and general shift away from conspicuous consumption.

Wider relevance

This case study also highlights the potentially important role of theory-based qualitative evaluations in conservation (Salazar et al. 2019). Conservation issues often involve many interacting biological, social, political and socio-economic factors, operating at a range of scales and time periods (Margoluis et al. 2009; Knight et al. 2019). Theory-based impact evaluation methodologies can help establish causal attribution in cases where we lack baseline data or a credible counterfactual (White 2009). They allow researchers to take a wider view of the system under investigation, to consider alternative mechanisms and investigate heterogeneity in perceptions amongst stakeholder groups (De Allegri et al. 2018). Quantitative data can then be incorporated into the analysis alongside richer, qualitative data (Leeuw and Vaessen 2009). Adopting this new approach will help us move away from debates about whether a single intervention caused a particular outcome, instead recognising that there are likely to be multiple contributing factors driven by interactions between different actors (Birnbaum and Mickwitz 2009; Curzon and Kontoleon 2016). In doing so, we can challenge current simplistic narratives and gain a more nuanced understanding of conservation interventions.

Our analysis highlights the importance of understanding the cultural context in which interventions take place (Waylen et al. 2010). Notably, we identified several facilitating conditions that enabled drivers to impact consumers. These included respect for government authority, the passive nature of demand for ivory, and a general cultural shift away from conspicuous consumption. Without these cultural attributes, the same market drivers (e.g., the CITES trade ban) enacted in other

countries may have led to very different outcomes (Bergin et al. 2019). In addition, many of the drivers we identified, from increased media coverage to the economic recession, were not under the deliberate control of a single stakeholder and so would also be difficult to replicate in other nations. However, the CITES international trade ban had a major influence on demand, and pressure from the international community and national media did indirectly contribute to market changes. A theory-based evaluation approach illuminated the complexity of these interacting drivers, enabling us to conclude that Japan's ivory market is currently unlikely to be a threat to elephant population given the long-term reduction in demand for ivory.

Supplementary material

https://bit.ly/3w4HE6T

Author Contributions Statement

BM and DV conceived and designed the study; LTW, TK and BM collected the data; LTW analysed the data; LTW led the drafting of the manuscript. All authors contributed critical, intellectual content to the drafts and gave final approval of the version to be published.

Declaration of competing interests

The authors declare no competing interests in the conduct of this research.

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Research ethics approval

This research was approved by the Imperial College Research Ethics Committee (2018–01416450–MORKEL-Bvdb) and the University of Kent Research Ethics Advisory Group (14-PGR-18/19).

Data availability

The qualitative data is not accessible due to privacy restrictions.

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