

Institution: Cardiff University		
Unit of Assessment: UoA4 - Psychology, Psychiatry and Neuroscience		
Title of case study: Changing UK legislation on consumer charges designed to reduce single-use plastic waste		
Period when the underpinning research was undertaken: 2013 – 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s): Wouter Poortinga Lorraine Whitmarsh Gregory Thomas	Role(s) (e.g. job title): Professor Professor Research Associate	Period(s) employed by submitting HEI: 01/01/2006 – present 01/04/2009 – 30/06/2020 2015 – present
Period when the claimed impact occurred: 2013 – 2019		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact (indicative maximum 100 words) Reducing single-use plastic waste is a problem that requires broad public behavioural change supported by effective legislation. Cardiff research quantified the impact and public acceptance of single-use plastic bag and disposable coffee cup charges. It was the first to identify both increasing public support for charges as well as increased public appetite for further, related policy changes. This research underpinned Welsh, Scottish and UK Government policy changes, which led to charging for single-use plastic bags and disposable coffee cups. It also directly prevented 9.4 million disposable coffee cups going to landfill from catering companies and was highly influential with regard to national debates around single-use plastics and packaging.		
2. Underpinning research (indicative maximum 500 words) Plastic waste often does not decompose and can last centuries in landfill or end up as litter in the natural environment. This, in turn, pollutes soils, rivers and oceans harming animals living in these habitats. Led by Poortinga, Cardiff research on this significant societal challenge involved a series of interlinked research projects on carrier bag and coffee cup charging.		
2.1 Single-use plastic bags In 2011 the Cardiff team received funding from the Welsh Government to evaluate the success of the introduction of the Welsh carrier bag charge [G3.1]. Wales was the first country in the UK to introduce legislation, charging 5p for every single-use carrier bag sold on and after 1 October 2011. Previously, single-use carrier bags were free. This research was the first ever long-term, controlled field study exploring behavioural and attitudinal impacts of a carrier bag charge, with measurements obtained immediately before, and six months after, the introduction of the legislation [3.1]. The results showed that the carrier bag charge substantially reduced usage and that the policy increased in popularity after it was introduced. A follow-on post-implementation review, commissioned by the Welsh Government [G3.2], confirmed that the charge directly reduced single-use plastic bags, but also indicated that bags-for-life had begun to accumulate in people's homes [3.2]. In 2015, the law was changed in England, requiring shops to charge 5p for all single-use plastic carrier bags. Via ESRC funding, the Cardiff team carried out an in-depth investigation [G3.3], combining qualitative and quantitative methods, of behavioural and attitudinal impacts to the English plastic bag charge. They also undertook secondary data analysis on the impact of the Welsh charge for plastic bags [3.3-3.5]. The results confirmed the previous findings and provided further evidence that bags-for-life were accumulating in people's homes [3.4]. A key finding was evidence of 'policy spillover' [3.5]: people did not only become more supportive of the plastic bag charge after it was introduced, they also became more supportive of the introduction of other charges to reduce plastic waste.		

2.2 Disposable coffee cups

The outcomes of the ESRC-funded project led directly to a collaboration between Cardiff University and Bewley's, Ireland's leading tea and coffee company and one of the largest coffee roasters in the UK and Ireland [G3.4]. This study meant Bewley's became the first coffee company to commission research into discouraging disposable coffee cups. The research was carried out at twelve sites across the UK managed by Bartlett Mitchell, a contract caterer, and four UK universities between September and December 2016.

The research found that the use of single-use coffee cups could be reduced annually by 50 to 300 million through introducing easily implementable measures [3.6]. These included cafes and coffee shops offering financial incentives, re-usable alternatives and providing clear messaging reminding customers about the environmental impact of disposable cups. A key finding was that a 25p charge on disposable cups increased the use of reusable cups, but that a discount on reusable cups did not [3.6].

In summary, the Cardiff research not only showed that modest charges on plastic bags and disposable coffee cups led to substantial behavioural changes, but also that the charges act as a catalyst to wider awareness of the detrimental impacts of plastic waste and pollution, leading to increased public support for further policy actions.

3. References to the research (indicative maximum of six references)

[3.1] Poortinga, W., Whitmarsh, L., & Suffolk, C. (2013). The introduction of a single-use carrier bag charge in Wales: Attitude change and behavioural spillover effects. *Journal of Environmental Psychology*, 36. <http://doi.org/10.1016/j.jenvp.2013.09.001>

[3.2] Warmington, J., Owen, N., Mayne, B., Downing, P., Holland, M., Poortinga, W., & Whitmarsh, L. (2016). Post-implementation review of the single-use carrier bag charge in Wales. Cardiff: Welsh Government Social Research <https://gov.wales/post-implementation-review-single-use-carrier-bag-charge-wales-final-report>

[3.3] Thomas, G. O., Poortinga, W., & Sautkina, E. (2016). The Welsh single-use carrier bag charge and behavioural spillover. *Journal of Environmental Psychology*, 47, 126–135. <http://doi.org/10.1016/j.jenvp.2016.05.008>
<https://www.sciencedirect.com/science/article/pii/S0272494416300536>

[3.4] Poortinga, W., Sautkina, E., Thomas, G. O., & Wolstenholme, E. (2016). The English plastic bag charge: Changes in attitudes and behaviour. Cardiff: Welsh School of Architecture & School of Psychology, Cardiff University. <https://orca.cf.ac.uk/94652>

[3.5] Thomas, G. O., Sautkina, E., Poortinga, W., Wolstenholme, E., & Whitmarsh, L. (2019). The English plastic bag charge changed behavior and increased support for other charges to reduce plastic waste. *Frontiers in Psychology*, 10, 266. <https://doi.org/10.3389/fpsyg.2019.00266>

[3.6] Poortinga, W., & Whitaker, L. (2018). Promoting the use of reusable coffee cups through environmental messaging, the provision of alternatives, and financial incentives. *Sustainability*, 10(3), 873. <https://doi.org/10.3390/su10030873>

Selected grants:

[G3.1] Poortinga; Evaluation of the Introduction of the Plastic Bag Levy in Wales: Attitude Change and Behavioural Spillover, Welsh Government, 2011-2012 (£33,220)

[G3.2] Ricardo Consultancy (Cardiff University subcontracted); Post-Implementation Review of the Single-Use Carrier Bag Charge in Wales, Welsh Government, 2014-2015 (£98,875)

[G3.3] Poortinga; The English plastic bag charge and behaviour spillover: A field experiment, diary study and secondary data analysis, ESRC, 2015 – 2017 (£381,208)

[G3.4] Poortinga; Field experiment to encourage the use of re-usable coffee cups, Bewley's Tea & Coffee, 2015-2016 (In-kind award)

4. Details of the impact (indicative maximum 750 words)

Cardiff research into public acceptance of environmental charges for plastic bags and disposable coffee-cups led to the following impacts: 1) influenced policy passed by Scottish, Welsh, and UK Governments; 2) directly reduced the waste of UK and Irish-based coffee and catering companies; and 3) influenced public debate around environmental charging.

4.1 Influencing policy on plastic bag and disposable coffee cup charges

The Cardiff research was instrumental in informing changes in legislation, affecting England, Wales and Scotland.

- Environmental Audit Committee (EAC) Plastic Bag Enquiry:** In December 2013, Poortinga presented Cardiff's research into the Welsh plastic bag charge to the House of Commons Environmental Audit Committee's Plastic Bags Inquiry. Poortinga's evidence was central to the recommendation in the 2014 EAC Plastic Bags Report to remove exemptions for plastic bag charges for small retailers in England [5.1a]. The findings of the carrier bag research were also used by Surfers Against Sewage (SAS) and the Campaign to Protect Rural England (CPRE) in their submissions to the EAC Inquiry [5.2]. In January 2018, following an increase in public pressure, the UK government announced the extension of the plastic bag charge to small retailers in England.
- Wales Environment Act 2016:** Senior Evidence Advisor for the Welsh Government, Joanne Amesbury, commented on the impact of the Cardiff research [3.1, 3.2] into Wales' single-use carrier bag charge. The research *"has supported not just a commitment to continue with the charge but was also used in the development and implementation of the Wales Environment Act"* [5.3]. The Wales Environment Act was passed by the National Assembly in 2016 [5.4], giving ministers the power to set a charge for other types of carrier bags, including bags-for-life, given the Cardiff team's finding that bags-for-life were accumulating in people's homes [5.3]. Amesbury also stated that at a broader level that *"the Cardiff University research provides us with a view of how attitudes and behaviours have changed over time, which we are currently using to review our policies. We will use this information to decide whether changes to the current regulations are required"* [5.3].
- Environmental Audit Committee (EAC) Disposable Packaging: Coffee Cups and Plastic Bottles Enquiry:** In October 2017, Poortinga provided evidence to the EAC's Disposable Packaging: Coffee Cups and Plastic Bottles Inquiry on the findings of Cardiff's research on the English plastic bag charge [3.4, 3.5] and the work with Bewley's on disposable coffee cups [3.6]. Cardiff's research also featured in the EAC's Plastic bottles: Turning Back the Plastic Tide report, in particular that policy spillover was increasing public support for other environmental interventions, such as a deposit return scheme on plastic bottles [5.1b]. Poortinga was the only environmental psychologist at both EAC inquiries. This formed part of the evidence which led the Committee to advise the Government to introduce a 'latte levy' of 25p on disposable coffee cups, through its Disposable Packaging: Coffee Cups Report [5.1c].
- Scottish Circular Economy Bill:** Cardiff's research directly influenced the Scottish Government's proposed legislation to charge for single-use drinks cups in their Circular Economy Bill. The Scottish Government's advisory panel, EPECOM, liaised with Cardiff on their 'Recommendations on Single-use Disposable Beverage Cups' report [5.5]. As a result of Poortinga's research into single-use items and the effectiveness of charging for single-use cups [3.6], EPECOM commissioned Poortinga and colleagues to carry out a review which formed the basis of this report. The report recommended that *"separate minimum, mandatory pricing for cup and drink should be introduced at a national level to effectively change behaviour"* [5.5, p.12]. The Scottish Government's response went beyond the recommendations *"by enabling charges to be introduced for items that have been proven to cause environmental harm, for*

example, single-use beverage cups” in order to encourage behaviour change, as well as paving the way for additional charges on other items [5.6, p.6].

4.2 Direct environmental changes

Cardiff’s collaborative research with Bewley’s indicated a series of simple changes that could be implemented by coffee chains to reduce use of disposable cups [3.6]; notably, the research involved a number of Bewley’s clients, including CH & Co, Bartlett Mitchell, The University Caterers Organisation, David Lloyd Leisure Clubs, and Westmorland Service Stations [3.6]. To take part in the research, these clients were required to introduce reusable cups and a disposable cup tax.

As a result of these changes, Bewley’s (who provide disposable cups to these companies) confirmed a 30% reduction in sales of disposable cups since the research was completed in 2016, preventing approximately 9.4 million cups per annum from going to landfill [5.7]. One company, Bartlett Mitchell, prevented 500,000 disposable cups being used, through a policy banning any team members using disposable cups and introducing client training to encourage reusable cup use [5.8].

In addition to the reductions in cup sales for Bewley’s, data provided by the four universities that instituted the disposable cup tax confirmed a further 250K cups had been saved from landfill in one year alone. The Chief Executive of The University Caterer’s Organisation confirmed that all their members (186 higher or further education institutions) now operate a charging-based system or have removed disposable cups altogether, and estimates the total saving amongst their members (through Bewley’s and all other disposable cup providers) was around 10 million cups [5.7].

4.3 Raising public awareness and driving industry response

a. Plastic Bags

The Cardiff research was presented at the Royal Geographical Society in September 2016. More than 50 representatives of UK, Welsh and Scottish governments, (retail) industry, third-sector organisations, and members of the public debated the implications of the research for future policy on waste and litter. The Cardiff research results were widely reported in national and international media, with over 200 pieces reaching 54% of UK adults between 29 September and 31 October 2016 [5.9a].

In particular, Poortinga’s findings around policy spillover were widely reported in the media: “Some 90% of shoppers in England now use their own carrier bags, research from Cardiff University has suggested – up from 70% before the levy was introduced. So could similar charges be applied to other items to help the environment?” [5.9b].

b. Coffee Cups

Following the publication of the EAC Coffee Cups Report to which Poortinga provided key evidence, public interest in the latte levy and reusable cups increased in the following ways:

- UK Google Searches for “reusable coffee cups” immediately rose to approximately 10-fold of pre-publication levels, and since then have maintained a 4-fold increase for more than 2 years [5.9c].
- In their official response to the report, a UK Government spokesperson said “Businesses are already taking steps to limit their environmental impact, but we expect industry to go further and will return to the issue if sufficient progress is not made” [5.9d].
- Britain’s largest coffee chain, Costa Coffee, “obstructively lobbied” [5.9d] the government, claiming there was no evidence that the charge identified in the Cardiff research would work. McDonalds defended their approach to single-use plastic, while Coca-Cola acknowledged in a statement that “public awareness of the potential negative impacts of single-use plastics has risen considerably in the last 12 months” and called for reform of the system to ensure greater recycling [5.9d]. Starbucks

trialled a 5p charge on disposable coffee cups, leading to a 150% increase in reusable cup use [5.9e].

- The Houses of Parliament instituted an internal 25p surcharge on takeaway cups, which led to the number of cups falling from 58K to 15K per month [5.9d].
- The *Independent* adopted the report's proposed "latte levy" within their 2018 Cut the Cup Waste campaign, citing Cardiff's research that charging 25p per cup would help cut the number used by up to 300M a year [5.9e].

In summary, via collaboration with industry and government partners, the Cardiff team influenced government policy across Scottish, Welsh, and UK governments to introduce critical charging approaches designed to limit use of, and waste from, single-use plastics. The research additionally resulted in direct reductions in use of disposable coffee cups, of at least 9.4 million coffee cups, across the industry partners involved in the research, as well as influencing broader national discussion on single-use plastics, in addition to charging as an effective tool to address plastic use.

5. Sources to corroborate the impact (indicative maximum of 10 references)

[5.1] House of Commons Reports:

- a House of Commons Environmental Audit Committee (2014). Plastic bags (HC 861). London: House of Commons
- b House of Commons Environmental Audit Committee (2017). Plastic bottles: Turning Back the Plastic Tide. London: House of Commons.
- c House of Commons Environmental Audit Committee (2018). Disposable packaging: Coffee Cups (HC 657). London: House of Commons.

[5.2] Written evidence submitted to the disposable packaging inquiry from Surfers Against Sewage, Campaign to Protect Rural England, Foodservice Packaging Industry,

[5.3] Testimonial: Welsh Government on bags-for-life/ 2016 Environment Act

[5.4] Environment (Wales) Act 2016

[5.5] EPECOM Report of the Expert Panel on Environmental Charging and Other Measures: Recommendations on Single-use Disposable Beverage Cups

[5.6] Scottish Government Response to EPECOM recommendations

[5.7] Testimonial: Bewley's Tea and Coffee company

[5.8] Bartlett Mitchell Corporate Social and Environmental Responsibility (CSER) Report 2018

[5.9] Collated Media Items on the Plastic Bag Charge and Latte Levy

- a Plastic bag charge – Cardiff University news analysis (September 2016)
- b 'Plastic bag charge: could fee be applied to other packaging?' BBC News (29th September 2016)
- c UK Google Search trends for "reusable coffee cups"
- d 'Costa Coffee lobbied government against 25p 'latte levy' before proposals were binned', The Independent, (16th September 2019)
- e Latte levy: What is the proposal, and how could it help save the environment? 'The Independent' (5th January 2018)