Banning Retail Use of Plastic Bags: Do Shoppers Do More with Less?

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Abstract

This paper examines the impact on shopper behaviour of a legislated ban on the retail provision of single-use, check-out style plastic bags. Using cross sectional and longitudinal data from over 1167 interviews, the research examines ownership and use of reusable or 'green' bags by shoppers, in response to the ban. It compares this behaviour against what physical science researchers state is the required behaviour for 'green' bags to be an environmentally better alternative to single-use plastic bags. This paper finds that shoppers have widely and consistently adopted the use of 'green' bags, but have stockpiled them to levels above their immediate needs and that they do not intend to keep them for as long as is required for them to be a better choice that plastic.

Keywords: anti-consumption, plastic bags, sustainable development, product elimination, green marketing.

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Introduction

Since the early 1980's plastic bags have been provided free to consumers at supermarkets and other retail contexts (Hayabuchi *et al.*, 2005). Annually, 6.9 million plastic bags are used in Australia alone (Smith, 2004). The manufacture of plastic bags requires use of such natural resources as petroleum, ethylene, and coal (Wan, 2008; Environment Protection and Heritage Council, 2002), consuming an estimated 4% of the world's oil production (Ellis *et al.*, 2005). In their disposal, they contribute carbon dioxide and toxic chemicals to the environment, which impact on global warming, smog, and increase the likelihood of acidic rain (Ellis *et al.*, 2005). This is a major issue in Australia, with less than 3% of all plastic bags being recycled, leaving 6.7 billion plastic bags in landfills annually (Wan, 2007; Smith, 2004).

Research by Hayabuchi, et al. (2005) examining retail outlets that had instigated their own voluntary programs to encourage consumers to reuse plastic bags, suggests that without legislative enforcement, a reduction in the use of plastic bags by more than 50% is unlikely. This paper examines the impact of such a legislated intervention. In May 2009, South Australia became the first Australian state to have legislation banning single-use polyethylene plastic bags with handles less than 35 microns in thickness. In their place retailers are required to offer customers, for a fee, multiple-use 'green' bags, compostable (single-use) plastic bags, or other forms of reusable bags, such as paper bags. The most popular of these are 'green' bags, typically made of polypropylene fabric, which are purchased and then reused on subsequent shopping trips.

It is not the banning of single-use plastic bags alone that will create a positive impact on the environment, but also the behaviour of consumers after the ban is in effect. Which bag the consumer chooses to use (if any), how long they think these bags last for before they are disposed of, and how often they use them, will all have a major impact on the environment. This article looks at how shopper behaviour has changed since the ban in relation to the ownership and usage of 'green' bags and the implication of this for 'doing more with less' in transporting grocery shopping. As supermarkets accounted for over half of all new plastic bag use pre-ban (Smith, 2004), this is the research context of this paper.

The Case for Green Bags

'Green' bags are put forward as being a less harmful alternative to the environment than the single-use plastic bags. Over an assumed usage period of two years, they contribute three times less CO_2 to the environment and requiring four times less energy to produce than single-use plastic bags (Zero Waste SA, 2008). However, if this usage assumption is not followed and consumers were to use 'green' bags as single-use bags, then the ban would in fact prove more harmful to the environment. In this scenario, the reusable 'green' bags would actually take more energy to produce than a single-use plastic bag, proving to be approximately 65 times worse than using the single-use plastic bags (Verghese et al., 2009). Even if the 'green' bags were used for one year (52 times), instead of two years, the effect that they would have on the environment would be around 1.2 times worse than that of plastic bags (Verghese *et al.*, 2009). It is only when the 'green' bags are used for two years that the impact they have on the environment is significantly less than that of the single-use plastic

bags (Verghese *et al.*, 2009). And 'green' bags have been made to last at least this length of time, so their life time expectation is reasonable (James and Grant, 2006).

Ellis, et al. (2005) also argue that 'green' bags can be worse for the environment than single-use plastic bags, but claim that their impact is less than that asserted by Verghese et al. (2009) and James and Grant (2006). Ellis et al. (2005) claim that one of these 'green' bags uses approximately the same amount of resources to produce as four single-use plastic bags and emits approximately the same amount of greenhouse gases as these four single-use plastic bags. Under Ellis et al.'s claim, then if one 'green' bag is used instead of five plastic bags, the direct effect that the creation of shopping bags have on the environment will be reduced (excluding the use of extra bin liners purchased and the disposal of the bags which is outside of the scope of this paper to consider) (Ellis *et al.*, 2005).

As well as length of time bags should be used for, the number of bags owned has also been examined from the physical science perspective and overall impact. James and Grant (2006) estimated that, on average, households should use 4.15 of the 'green' bags per year. If they maintain this 4.15 'green' bags usage level in a year, then they would have successfully replaced the estimated 520 plastic bags that the average household uses yearly (James and Grant, 2006). Verghese (2009), also confirms that if a greater number of 'green' bags are consumed, then they will be a worse option overall for the environment than plastic bags.

Research Aims

The research papers have all hypothesised what behaviours are required for the move to 'green' bags from plastic to be positive for the environment. However, empirical evidence on how shoppers have *actually* integrated 'green' bags into their shopping behaviour post ban, has not yet been addressed and is the key aim of this research. In order to assess the effectiveness of such a legislated social marketing intervention as a mechanism for behaviour change, the research questions examine the number of 'green' bags shoppers own and how long they are kept for. This can then be compared to the behaviours required for the change to be a better alternative than single-use plastic. Additionally, the efforts shoppers are going to reinforce the behaviour of own-bag shopping, now that retailers no longer supply free alternatives, is examined. This offers insight into shoppers reactions to having behaviour forcibly changed rather than changed through say an incentive system or voluntary ban. Finally, the research examines the choices that are made in-store when shoppers forget their 'green' bags. Is it that they are buying the compostable single-use plastic alternative (and hence continuing the consumption of plastic), or investing in more 'green' bags?

Methodology

The initial research consisted of 510, 12-minute telephone interviews conducted before the ban had been passed as legislation, to benchmark behaviours. An additional research stage consisted of 502, 14-minute telephone interviews, conducted two months after the ban's implementation. 253 of these final interviews were with respondents who also participated in the benchmark study. Reinterviewing half of the respondents from the benchmark allowed for the identification of attitudinal and behavioural changes between the two research studies. Non-response bias amongst the re-contacts was unlikely, as a response rate of over 60% was achieved in the follow-up (Gendall, 2000) and their pre-intervention bag usage behaviour

matched that of the entire overall benchmark sample. The other 254 final stage respondents were recruited as a control.

Interviews were conducted using a commercial telephone interviewing field team. Respondents were randomly recruited from the electronic White Pages and screened for being the main household shopper to ensure that only shoppers on whom the ban would have a direct effect were included.

Eleven-point 0 to 10 scales were used to measure attitudes and behaviours. Analysis was conducted using SPSS 17, with cross tabulations and independent two-sample t-tests and paired t-tests used in analysis.

Findings and Discussion

Respondents who were interviewed at both the benchmark and final research stages showed an improvement in taking their own bags shopping, with the implementation of the ban. Prior to the ban, 61% said they took their own bags shopping, 34% were entirely reliant on store bags, and 5% used both. Overall, 80% of all respondents said that, in a typical week, they would use at least some store-supplied plastic bags.

Once the ban was effective, behavioural compliance rose sharply, with 95% claiming to take their own bags. The number of respondents who claimed to have started taking their bags within the last three months saw an increase from 4% prior to intervention to 28% when the ban was in effect. The behaviour was not only more prevalent but also more consistent, with incidences of forgetting to take bags decreasing from 2.2 to 1.5 trips in ten and not taking enough own-bags shopping decreasing from 1.8 to 1.0 trip in 10.

The number of bags that respondents claimed to take with them to meet their needs saw little change, with an average of 4.6 bags taken before the ban and 4.7 bags after by shoppers taking their own bags. This appears to be the amount shoppers need to meet their needs at a purchase occasion and approximates the number suggested by James and Grant (2006).

However, shoppers were found to own more bags than required to meet their shopping needs. The average total number of ‘green’ bags owned by shoppers before the ban was 10.4, which remained the same after the ban. The high number of reusable bag ownership means that respondents are either stockpiling reusable bags, or they are not displaying the required change in behaviour for the plastic bag ban to be effective. There is double the amount of bags being kept than is required to meet current shopping needs. This may be due to respondents keeping bags in multiple locations so as to avoid being ‘caught out’ in a situation where they need to shop but do not have access to ‘green’ bags. This is supported by the high proportion of all post-ban respondents (80%) claiming to keep green bags in their car as well as in other locations.

Another critical issue as to whether these new behaviours work out more positively for the environment than plastic bags, is how long the reusable bags are kept for before they end up in landfill (James and Grant, 2006). Respondents were asked how long they thought their ‘green’ bags would last for before they needed replacing. Only 42% of respondents believed that their ‘green’ bags would last them two years or more. 27% believed that their ‘green’ bags would last between one and two years, while one third of respondents believed that their ‘green’ bags would not even last them a whole year. These numbers are alarming, as ‘green’

bags need to be used for two years for them to be a superior environmental choice. This then becomes of even more concern with the finding that only 36% of respondents claimed that they washed their 'green' bags. This lack of washing means that 'green' bags could potentially become a health problem if both raw meats, fruit and vegetables have been stored in the same 'green' bags without being washed (Cirko, 2009). It also reflects a mentality that the bags are not supposed to be washed and reused for an extended time.

Two thirds of post-ban research respondents said they sometimes forgot, or did not take enough of their own bags shopping. In this scenario, 29% said that they try to carry the groceries or to use the trolley instead, thereby avoiding a bag purchase of any kind, 27% buy more 'green' bags, 18% buy compostable plastic bags, while only 8% change shopping behaviour by buying fewer things (4%) or overfilling their existing bags (4%). The remaining respondents had not yet confronted the situation. This means that over a quarter of the respondents buy more reusable bags when they forget or do not have enough 'green' bags with them at the supermarket, increasing the stockpiling behaviour.

The most popular way that shoppers reminded themselves to take their reusable bags shopping with them was leaving their bags in their car. This behaviour was claimed by two thirds of respondents post ban. The second most popular method was to carry reusable bags in their handbag (13%).

The bags that respondents choose to purchase when they either forget their reusable bags, or did not have enough, are mainly more 'green' bags (46%). However, one quarter of respondents are still paying for single-use bags; 11% are buying compostable plastic bags and 11% are purchasing reusable plastic bags (which sit between the single-use and 'green' in terms of cost and usage life). When considering how to choose amongst the different bags available for purchase, 30% of respondents claimed that their key purchase consideration was how the bag will impact on the environment. This indicates a strong willingness on behalf of shoppers to be educated to 'do the right thing' in relation to bag usage. A further 29% claimed that their key consideration was the ability to reuse the bag, while one quarter of respondents claimed price as the key criteria. Clearly there is an opportunity for more education so shoppers know which bag choices are best for the environment in different circumstances and the associated bag life expectancy of each choice.

Conclusion

The research findings suggest that the shopping bag behaviour of respondents, in terms of environmental impact, has improved with the introduction of the legislated ban on single-use plastic bags. Shoppers have improved in the level of own-bags that are taken grocery shopping and the consistency with which they remember to take 'green' shopping bags with them to the supermarket. They have also got better at estimating how many 'green' bags are required to meet their shopping needs on each trip. All these behaviour changes are positive, because the more often consumers take enough of their own reusable bags shopping with them, the fewer reasons they have to purchase more 'green' bags or the compostable single-use plastic alternatives.

However, when respondents do not have enough reusable bags with them, or forget to take them altogether, approximately half (46%) are buying more supplies of reusable bags. This is an unsustainable behaviour and results in stockpiling. This could be improved through continued communications encouraging consumers to partake in behaviours that remind them

to take their reusable bags shopping, such as leaving their reusable bags in the car. It appears that this is one of the most prevalent and successful ways shoppers are remembering to take their own bags shopping with them. The findings also support the notion that shoppers are receptive to such messages as they are seeking to have positive environmental outcomes through their shopping bag choices.

The number of green bags that respondents are using is a positive sign, with consumers claiming that they take approximately 4.7 'green' bags per supermarket shop, which is only slightly higher than the number of 'green' bags per year Verghese (2009) estimated shoppers would use. However, consumers own more than double this number of 'green' bags, which is an indication that consumers need to be educated on this issue before the use of 'green' bags can be effective at reducing the environmental impact of shopping bags.

Also of concern is that shoppers do not expect their 'green' bags to last the two years that is required for them to be a superior alternative to plastic. However, this research occurred early in the ownership stage (two months into the ban) and so shoppers may well revise their estimates and behaviours as they actually experience the effect of usage on their bags and their new behaviours become entrenched.

To summarise, the research indicates that consumers have altered their grocery shopping behaviours since the plastic bag ban has come into effect. The majority of behaviour change is positive, but it is not yet at the stage where it can be clearly said to be better for the environment than the banned single-use plastic bags. While consumers are on their way to consuming fewer resources to carry their shopping, it cannot yet be clarified if the plastic bag ban has in fact lead consumers to change their shopping behaviours enough to be able to do more shopping, while consuming less resources with the bags that they use. In conclusion, there is evidence that a legislated ban on single-use plastic polyethylene bags is an effective behaviour change mechanism for shoppers, but that the impact may be further enhanced through other levers such as a social marketing program run in tandem. This would help to profile and encourage best-practice new behaviours.

Limitations & Future Research

Future research in this area would be useful to determine if consumers continue to change their shopping bag behaviours as the ban becomes more familiar to them and their behaviours more entrenched. The post-ban research in this paper was conducted only two months after the plastic bag ban came into effect. It may well be that behaviours take time to settle and that shoppers start to reduce their stockpiling behaviours of 'green' bags with time. It may also be that they use them for a two-year period despite many of them estimating currently that they would not.

Other possible extensions of this study include: assessing the ban's effect on behaviour change against other approaches such as a tax on plastic bags and examining how the own-bag behaviour might have spread to other retail contexts. The impact of bin liners and their required purchase, now that free plastic bags are no longer available for this purpose, also warrants examination in the overall context of resource usage.

References

Cirko, C., 2009. Grocery Carry Bag Saniation: A microbiological study of reusable bags and 'first or single-use' plastic bags. Environment and Plastics Industry Council.

Ellis, S., Kantner, S., Saab, A. and Watson, M., 2005. Plastic grocery bags: the ecological footprint. Vipirg, Victoria, BC

Environment Protection and Heritage Council, 2002. Plastic Shopping Bags in Australia: National Plastic Bags Working Group Report to the National Packing Covenant Council. Adelaide, Environment Protection and Heritage Council.

Gendall, P., 2000. Responding to the Problem of Nonresponse. Australasian Journal of Market Research 8 (1), 3-17.

Hayabuchi, Y., Enomoto, Y., TYamasue, E., Okumura, H. and Ishihara, K., N, 2005. The role of environmental education and social system on the plastic bag problem. In: Proceedings of 3rd Conference on the Public Sector Ljubljana, Slovenia:

James, K. and Grant, T., 2006. LCA of degradable plastic bags. In: Australian Life Cycle Assessment Conference: Sustainability Measures for Decision Support Sydney:

Smith, S., 2004. Plastic Bags. NSW Parliamentary Library Research Service, Sydney.

Verghese, K., Lewis, H., Fitzpatrick, L., Hayes, G.-D.M. and Hedditch, B., 2009. Environmental impacts of shopping bags. The Sustainable Packaging Alliance Limited, Melbourne.

Wan, T.S., 2007. Reducing Polyethylene Usage. Department of Material Science and Engineering, Toronto.

Zero Waste SA, 2008. What's wrong with plastic bags? Adelaide, Government of South Australia.