



Short report

Sales impact of displaying alcoholic and non-alcoholic beverages in end-of-aisle locations: An observational study



Ryota Nakamura^{a,b}, Rachel Pechey^a, Marc Suhrcke^{a,b}, Susan A. Jebb^{a,c},
Theresa M. Marteau^{a,*}

^a Behaviour and Health Research Unit, Institute of Public Health, University of Cambridge, UK

^b Health Economics Group, Norwich Medical School, University of East Anglia, Norwich, UK

^c MRC Human Nutrition Research, Elsie Widdowson Laboratory, Cambridge, UK

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ABSTRACT

In-store product placement is perceived to be a factor underpinning impulsive food purchasing but empirical evidence is limited. In this study we present the first in-depth estimate of the effect of end-of-aisle display on sales, focussing on alcohol. Data on store layout and product-level sales during 2010–11 were obtained for one UK grocery store, comprising detailed information on shelf space, price, price promotion and weekly sales volume in three alcohol categories (beer, wine, spirits) and three non-alcohol categories (carbonated drinks, coffee, tea). Multiple regression techniques were used to estimate the effect of end-of-aisle display on sales, controlling for price, price promotion, and the number of display locations for each product. End-of-aisle display increased sales volumes in all three alcohol categories: by 23.2% ($p = 0.005$) for beer, 33.6% ($p < 0.001$) for wine, and 46.1% ($p < 0.001$) for spirits, and for three non-alcohol beverage categories: by 51.7% ($p < 0.001$) for carbonated drinks, 73.5% ($p < 0.001$) for coffee, and 113.8% ($p < 0.001$) for tea. The effect size was equivalent to a decrease in price of between 4% and 9% per volume for alcohol categories, and a decrease in price of between 22% and 62% per volume for non-alcohol categories. End-of-aisle displays appear to have a large impact on sales of alcohol and non-alcoholic beverages. Restricting the use of aisle ends for alcohol and other less healthy products might be a promising option to encourage healthier in-store purchases, without affecting availability or cost of products.

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1. Introduction

In recent policy debates, comparatively little attention has been paid to the subtle ways in which the retail sector may influence purchasing, including product placement in prominent displays to attract shoppers' attention (Chevalier, 1975; Curhan, 1974; Frank and Massy, 1970; Klein and Wright, 2007; Park et al., 1989; Sorensen, 2008; Wilkie et al., 2002; Wilkinson et al., 1982). It is estimated that around 30% of total supermarket sales come from the ends of aisles (Cohen and Babey, 2012a,b; Sorensen, 2003), described by Cohen and Babey as "the most important malleable determinant of sales" (Cohen and Babey, 2012a, p.1381). Recent interest in public health and policy circles on environmental influences (such as in-store layout) that affect behaviour without full

conscious awareness provides a clear impetus for an in-depth evaluation of the impact of end-of-aisle display on sales (Cohen and Babey, 2012a; Marteau et al., 2012).

While it is likely that marketing research exists within the retail and manufacturing industry regarding the sales effect of an end-of-aisle location, there are equivocal results from empirical published evidence (Bemmaor and Mouchoux, 1991; Chevalier, 1975; Curhan, 1974; Glanz et al., 2012; Sigurdsson et al., 2011; Wilkinson et al., 1982). The most relevant experimental studies, conducted over thirty years ago, found that special display (a special location plus a standard shelf space) increased unit sales of brands of soap, pie shells, apple juice, and rice by between 77% and 243% (Wilkinson et al., 1982), and prime location increased sales of hard fruit and cooking vegetables by 26% and 48% (Curhan, 1974), respectively, in the USA. In contrast, a more recent study from Norway reported that displaying bananas at check-out locations failed to increase sales (Sigurdsson et al., 2011). Effect size estimation is made all the more challenging as not all studies have attempted to disentangle the effects of price, price promotion and promotional location.

* Corresponding author.

E-mail address: tm388@cam.ac.uk (T.M. Marteau).

The effect may also be modified by characteristics including the real or perceived 'healthiness' or desirability of a product.

The aim of the current study is to provide the first systematic estimate of the effect of end-of-aisle displays on product sales, controlling for price, price promotion, number of display locations, as well as other product-specific characteristics. The study focuses on alcohol products, to add to the evidence-base for potential policy interventions to reduce population alcohol purchasing, and subsequent consumption. For comparison purposes, three types of non-alcoholic beverages – carbonated drinks, coffee and tea – are also considered. Carbonated drinks include both sugar-sweetened and artificially sweetened beverages. Coffee and tea were included in different forms (e.g. ready-to-drink, ground, and bagged).

2. Methods

2.1. Data

The data comprised a novel combination of two commercially available datasets: TNS PathTracker and Kantar WorldPanel. The TNS PathTracker data came from one store of a major supermarket chain in the UK, and consist of: (1) the display location(s) for each product ("stock keeping unit") in that supermarket (out of approximately 1150 display locations); (2) the paths taken in store by a proportion of the supermarket's trolleys, tracked using radio-frequency identification, along with the corresponding purchases. Information on shoppers' characteristics, including shopping history, was not collected. Also, data on shopping trips which did not involve purchasing an item from any of the six beverage categories were not available for the present study. The data covered thirteen weekly slices of a full year, from March 2010 to February 2011. These weekly slices were the first weeks following 4-weekly verification of the products displayed in end-of-aisle locations. Data were collected only for products that were actually purchased (total 1639 products from the six categories): information was not available for products that were never purchased in a given week (no imputation was made for the missing variables of products that were not purchased).

The data on price, price promotions, and other product attributes were incorporated from Kantar WorldPanel data relating to the same period. Since the relevant supermarket chain operates a national pricing policy and, hence, the price of a product is the same across the country (Competition Commission, 2000), these variables are based on data from any branches of this supermarket, not just on the particular store observed in the TNS PathTracker data.

By combining these data, a product-level weekly sales dataset, in which each product was observed a maximum of 13 times (average 7.8 times), were constructed. The weekly sales volume of each product was aggregated from the volume purchased by shoppers using the tracked trolleys. Data were used for six beverage categories, three alcoholic – beer, wine, spirits – and three non-alcoholic – carbonated drinks, tea and coffee.

2.2. Store characteristics

The store is located in a city in northern England, and it is a branch of a major UK supermarket chain with an average sales area of around 2500 m² (IGD Retail Analysis, 2013). The typical target of the store is mid-lower income consumers (USDA Foreign Agricultural Service, 2011).

2.3. Display location

The key locations of interest in this study were end-of-aisle displays (special within-aisle displays and the check-out area

were not considered). The display location for each product was recorded by marketing company employees during routine store visits. The majority of beverages included in this analysis were located in two sets of aisles, separated by a main thoroughfare which bisected the store. Most aisle ends were located along this main thoroughfare, and facing the thoroughfares that skirted the edge of the store. In addition, ends of smaller aisles, where standard aisles were broken into two, were also included. The display locations are assumed to be fixed over a week.

2.4. Analytic approach

Aisle ends are promotional display locations. Products placed in aisle ends may be characterized by different prices and price promotions compared to products located elsewhere in the store. Price and price promotion are therefore potential confounders of the effect of end-of-aisle display and are controlled for within a multiple regression analysis.

The analytical strategy for isolating the effect of end-of-aisle display rests on the following market convention. Price promotions are proposed by the manufacturer to the retailer during a specific period of the year. The retailer then allocates aisle ends to products for which manufacturers have proposed substantial promotions, sometimes with "slotting fees" (Kantar WorldPanel, personal communication). This implies that the price and price promotion have been fixed at the time when aisle ends are being allocated. The effect of end-of-aisle display on sales can therefore be isolated once the effects of price and price promotion on allocation of aisle end as well as sales are controlled for.

2.5. Statistical analysis

The regression analysis was conducted with log-scaled sales volume of each product as the dependent variable (i.e. to correct skewed distributions). The key independent variable was the indicator of end-of-aisle display, with the number of display locations, price per volume, proportion of the week on price promotion, average price of other products in the same category, total number of trolleys purchasing any product from the category in the week, and indicators of each week (which capture seasonal variations in the demand for particular items) as control variables. It should be noted that displaying an item on an aisle end entails additional shelf space (as products are still displayed on the main shelves as well). This component of end-of-aisle display is captured by the variable comprising the number of display locations allocated to each item.

Given that only products that were actually purchased were recorded in the data, a truncated regression model was used (Fixed effect truncated regression estimated via trimmed least squares (Honoré, 1992)). Fixed effect estimation techniques were used to account for (time-invariant) product-level heterogeneity such as brand, size, and normal price. The analysis was conducted separately for the six product categories (beer, wine, spirits, carbonated drinks, coffee and tea), using Stata MP 12.1. All analyses were conducted during 2012–13. Ethical approval was not required for this secondary analysis of commercial data.

3. Results

The average number of aisle ends allocated to products within the categories of interest per week was 8.4 for beer; 10.1 for wine; 2.9 for spirits; 8.5 for carbonated drinks; 3.7 for coffee; and 2.6 for tea. In contrast, the average number of normal shelves allocated to products within the categories of interest per week was 20.9 for beer; 29.3 for wine; 6.9 for spirits; 20.8 for carbonated drinks; 5.2

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