The Power of Point-of-Purchase Signage

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ABSTRACT

Our study set out to answer a simple but important question: Are properly designed point-of-purchase (POP) signs alone enough to increase sales of compact fluorescent lamps (CFLs)? Program sponsors typically include POP as part of multi-pronged and often expensive promotional efforts, which may include incentives, buy-downs, print ads, and other forms of advertising. Therefore, it has been difficult to evaluate the impact of each element, especially since most retailers do not release sales data. Research in social psychology suggests that POP alone should be sufficient to promote increased sales.

In collaboration with national retailers, utilities, and other ENERGY STAR program sponsors, the research team tested three different signs designed using social psychological principles for three weeks in 109 stores across the country. An additional 36 stores served as a control group. Actual sales of CFLs were compared with same-period sales from the previous year. When background differences in store environment were controlled for, one sign was associated with a statistically significant 15-percentage-point increase in sales compared to stores with no sign.

This paper describes in detail the study's methodology, findings, and conclusions. Implications for energy efficiency program design and directions for further research are also discussed.

Objectives

The primary objective of the study was to determine whether compelling POP signs alone are sufficient to achieve a measurable increase in CFL sales. We also sought to determine which of the two dominant consumer messages, long life and savings, are most effective. If the signs successfully stimulated CFL sales, they also would demonstrate the value of incorporating behavioral insights from social psychology into signage design.

This research was conducted to better understand how to affect in-store sales of ENERGY STAR qualified CFLs. Repeated, controlled studies in numerous countries have consistently found that consumers make more than 70 percent of their retail purchase decisions in store (Adams 2004, Liljenwall 2004) and that the typical CFL is now a commodity product with a relatively low price point. Given these observations, we hypothesized that most CFL purchases are impulse purchases. Thus, messages should have their greatest influence on consumers' purchasing decisions when delivered at the point of purchase.

The most rigorous studies of POP advertising at retail are the Point of Purchase Advertising Institutes' *P-O-P Measures Up: Learning from the Supermarket Class of Trade* and *In Store Advertising Becomes a Measured Medium: The Convenience Channel Study*. These studies have found that POP advertising delivers measurable sales lift only 50 percent of the time, and when it does, sales increase an average of 12 percent in supermarkets and 20 percent in convenience stores (Adams 2004).

The observation that half of POP displays provide zero sales lift confirms the generally accepted view that communication pieces can vary dramatically in their relative effectiveness. Fortunately, social psychologists have spent over half a century working to discern the fundamental determinants of human behavior, including what factors improve the degree of influence a communication exerts on individual and group behavior. Their overall observation is that often it is not rational decision-making or even beliefs and attitudes that are the primary determinants of behavior. Rather, a set of subtle situational factors such as the vividness of the communication, how a message is framed, the authority of the information source, and the perceived similarity of others engaged or reportedly engaged in the behavior, to name a few, are often the primary determinants of behavior (Aronson 2004). As far back as the early 1980s, leading social psychologists have recommended that energy efficiency program designers craft their communications and programs to reflect experimental insights on strategies that create influential situational factors (Aronson and O'Leary 1993, Costanzo et al. 1986, Dennis and Soderstrom 1988, Geller 1992, Kempton et al. 1992, Lutzenhiser 2002, McKenzie-Mohr and Smith 1999, Stern 2002, Wilson and Dowlatabadi 2007).

In the energy efficiency community, the effectiveness of POP signage is not typically measured in isolation. When it or some element such as core messaging is evaluated independently, budget constraints typically restrict the choice of assessment tools to focus groups and interrogative surveys. Rather than rely on self-reporting, which has consistently shown to be an imperfect predictor of actual behavior, the researchers sought to use an objective measure of impact on the desired behavior, i.e., changes in actual unit sales.

Methods

The methodology was conceptually simple: (1) select a small set of consumer messages to test, (2) design signage to convey those messages as effectively as possible at point-of-purchase, (3) produce and install the signage in a sample of retail stores, (4) gather sales data from those stores and from a control group of stores, and (5) compare CFL sales when signage was present with CFL sales when it was not. The remainder of this section explains the methodology in more detail.

Message Selection and Signage Design

The research team reviewed publicly available market research on attitudes, sales, and marketing of CFLs and consulted with industry and energy efficiency program sponsor experts to identify the two sales messages thought to be most effective. These were long life and energy cost savings. Long life had scored highest in focus group tests, but more recent tests in the U.S. and Canada found savings as high or higher. We therefore decided to test the long life message, the energy cost savings message, as well as a combined message to test for synergies between the two "pure" messages.

Signage that conveyed these messages was designed to maximize impact on sales, subject to the constraints imposed by the sales environment. Insights from social psychology were applied to signage design. We sought to incorporate four social psychological messaging tools (Table 1).

Table 1. Messaging Tools from Social Psychology

Tool	Explanation	Examples
Potent language and images ▫ Vivid ▫ Concrete ▫ Personal ▫ Simple ▫ Specific	Language and images need these five characteristics to be effective, meaning attention grabbing, compelling, and memorable.	We call that a naked attic. Driving your brother's Corvette: priceless.
Loss framing	People dislike losses more than they like gains and respond more strongly to loss-framed messages.	You're losing $70 every year you keep that old fridge.
Social proof	People take cues from others. The more like us others appear, the greater their influence.	Find out why all your neighbors are...
Authority	Most people will follow authority and are very sensitive to authority and its symbols.	Four out of five dentists surveyed... The brand most professionals use...
Contrast effect	Almost all judgments are comparative. The more recent the reference point, the stronger the influence.	Their price $500. Our price $249.
Scarcity	The scarcer a commodity, the more people want it and feel a strong compulsion to act quickly and decisively.	10 days only! Only two models left!
Prompts	The closer in space and time, the more effective the reminder.	A car's automatic beeping when a driver's seatbelt is not fastened. "Switch me off" stickers on light switches.

Drawn from Aronson 2004, Aronson and O'Leary 1993, Cialdini 2002, Costanzo et al. 1986, Dennis and Soderstrom 1988, Geller 1992, Kempton et al. 1992, Mckenzie-Mohr and Smith 1999, Wilson and Dowlatabadi 2007.

Images and messaging were crafted to conform to tested principles of effective communication and influence. After accommodating for requirements and preferences of the collaborating organizations (e.g., one retailer rejected loss framing because it was perceived as too negative), the researchers incorporated prompts and potent language and images. For example, one test sign showed a homeowner with a shocked expression viewing her utility bill accompanied by a caption that read "Shocked by your energy costs? Buy five [CFLs] and Save $150!" To catch shoppers' attention, the signs were produced at large size or in large number and mounted as aisle violators, which protrude into the aisle perpendicular to the plane of the shelving. Each sign bore the same image on both sides. Figure 1 shows the designs of tested signage.

Signage Installation

Signs were mounted in the light bulbs aisle of 109 retail stores; 40 received signs with the long-life message, 28 received signs with the money-saving message, and the remaining 41 received signs combined the long-life message with the money-saving message. A fourth group of 36 stores received no signs and served as controls.

Figure 1. Experimental Signage Designs

As noted above, research shows that prompts can be extremely effective at influencing behavior but that their influence is directly proportional to their proximity in space and time to the desired action (Aronson 2004, Cialdini 2001, Aronson and O'Leary 1993, McKenzie-Mohr and Smith 1999). To ensure that the signs would serve as an effective prompt, they were posted immediately adjacent to CFLs in each store's light bulb aisle.

Sample Design

The final analysis included data from 118 stores: 85 treatment stores, which received signage, and 33 control stores, which did not. The 118 stores were drawn from the population of stores in participating retailers' chains that were located in seven areas of the country where we were able to recruit field staff to support the project. Areas that lacked field staff support could not be included in the study. Within each of the seven study areas, participating stores were randomly assigned to one of the treatment or control groups. Table 2 lists the seven study areas

and gives the number of stores and share of total stores as well as population, median household income, and residential price of electricity for each area. These key characteristics are given to help generalize from this study's findings to other geographic areas, given that the study areas were not selected to be representative of the country as a whole. Note that income levels and electricity prices are just two of the many factors that could be related to the effectiveness of signage in a given area of the country.

Table 2. Key Characteristics of Geographic Areas in Which Stores Were Located

Geographic Area	Number of Stores in Study	Share of All Study Areas (%)	Population (millions)	Median Income ($000/yr)	Price of Electricity (¢/kWh)
Massachusetts & Vermont	13	11%	7.1	57	13.4
Northwest (ID, MT, OR, WA)	17	14%	12.3	39-49	6.8
Phoenix Metro	6	5%	3.9	48	8.7
San Diego Metro	9	8%	2.9	56	14.8
San Francisco Metro	23	19%	4.2	65	15.0
Minneapolis & Madison Metros	18	15%	3.7	53-60	9.1
Washington, D.C. Metro	32	27%	5.2	75	8.7
All Study Areas	118	100%	39.2	--	10.1
United States as a Whole	--	--	288.4	46	9.5

Table Notes:
- The price of electricity given for All Study Areas is the population-weighted average price.
- A small number of stores included in Minneapolis & Madison Metros are located in Wisconsin but outside of the Madison metro area.
- Income figure given for Minneapolis & Madison Metros is for Minneapolis metro area only.
- Income figure given for Massachusetts & Vermont is for Massachusetts only.

Table Sources:
- Population estimates for states from Table 1: Annual Estimates of the Population for the United States, Regions, and States and for Puerto Rico: April 1, 2000 to July 1, 2006 (NST-EST2006-01), Population Division, U.S. Census Bureau, December 22, 2006.
- Population estimates for metropolitan areas from Table 1: Annual Estimates of the Population of Metropolitan and Micropolitan Statistical Areas: April 1, 2000 to July 1, 2005 (CBSA-EST2005-01), Population Division, U.S. Census Bureau, August 21, 2006.
- Income figures from Table DP-3: Selected Economic Characteristics, 2005 American Community Survey, U.S. Census Bureau.
- Electricity prices from Energy Information Administration, Form EIA-861, "Annual Electric Power Industry Report" and from Bureau of Labor Statistics Consumer Expenditure Survey data compiled by Ameren Services, http://www.ameren.com/AboutUs/ADC_AUE_AvgElectPrices.pdf (last accessed February 13, 2007).

Participation of retailers and program sponsors made this study possible. Retailers made their stores available and provided sales data. Program sponsors offered field support to install and remove signage and conduct store assessments and provided input into the design of the experimental signage. Salt River Project provided field support through its contractor, Applied Proactive Technologies. Cape Light Compact, National Grid, NSTAR Electric, and Western

Massachusetts Electric Company provided support through their contractor, Lockheed Martin. The Northwest Energy Efficiency Alliance provided support through its contractor, Portland Energy Conservation, Inc. Efficiency Vermont provided support through its contractor, Vermont Energy Investment Corporation, and Wisconsin Energy Conservation Corporation provided direct support through its field staff. Through these collaborators, we gained access to expert opinions and insights from manufacturers' market research.

While the collaborators provided substantial added value to the study, they also restricted options and introduced some unexpected complications. For example, customizations were made to the three designs for some retailers, and not all retailers displayed every sign type. Most stores received two large signs that were mounted at each end of the CFL section, but some stores received four small signs that were mounted in a series adjacent to the CFLs. While most signs had only English text, some were required to have both English and Spanish text. These requirements led to testing of five designs rather than three.

Timing

Field staff conducted store visits in three stages. During the first stage, from June 15 to June 23, 2006, field staff visited most of the stores included in the study to establish the baseline and allow us to assess drivers of future sales. In the second stage, from July 6 to July 24, 2006, field staff made their second store visits, reassessed store conditions, and installed signage in all but the control stores. In the third stage, from August 7 to August 13, 2006, field staff returned to the stores to reassess store conditions once again and remove the experimental signage.

Types of Data Collected

We collected sales data from the participating retailers to calculate percent changes in CFL bulb sales. We also collected data from direct observations in each store that we used to control for variations in store environments that might explain some of the observed variation in CFL sales, both between stores and within a single store over time. All stores included in this study were assessed when signage was installed and again when signage was removed. Most also received a preliminary assessment a few weeks before signage was installed. Field staff used standardized survey instruments in each store to record characteristics deemed important to the study, including the amount of shelf space devoted to CFLs; the presence or absence of CFLs at the registers; and the presence, size, and content of CFL-related signage and other POP materials. We also used the completed store assessment surveys to verify for each store the number and type of signs and dates signage was present.

Sales Data Analysis

We collected and analyzed sales data from each store in the sample. We examined the year-to-year percentage change in CFL bulb sales—a comparison between the number of CFLs sold when experimental signage was present and the number sold in the same period a year earlier, when the experimental signage was absent. To control for time effects, we made the same comparison in a control group of stores that did not receive signage. As noted above, stores in each market were randomly assigned to either the control group or one of the treatment groups.

Of the 109 stores in which we installed signage, 24 had to be excluded from the analysis due to incomplete data. Table 3 gives additional detail.

Table 3. Number of Stores in Sample and Final Analysis

Group	Total in Field Study	Excluded from Analysis*	Included in Analysis
Control – No Sign	36	3	**33**
Treatment – Any Sign	109	24	**85**
Long Life Sign	40	9	**31**
Savings Sign	28	6	**22**
Combination Sign	41	9	**32**
Total	145	27	**118**

* Four stores were discarded and excluded from the analysis because they offered steeply discounted CFL bulbs at the time of this study. An additional 23 stores for which we lacked sufficient data were also excluded, for a total of 27.

We also attempted to compare CFL sales when experimental signage was present with CFL sales in the weeks immediately before and after. Our efforts were frustrated by several factors, principally the Independence Day and Labor Day holiday weekends at the beginning and end of the study period, times when stores typically hold sales and special events that would have confounded our analysis. It was also difficult to match sales data from weeks when signage was in place with sales data from adjacent weeks, due to the particulars of how sales data was reported. Lastly, field observations were not gathered from all stores in the weeks before and after signage was in place.

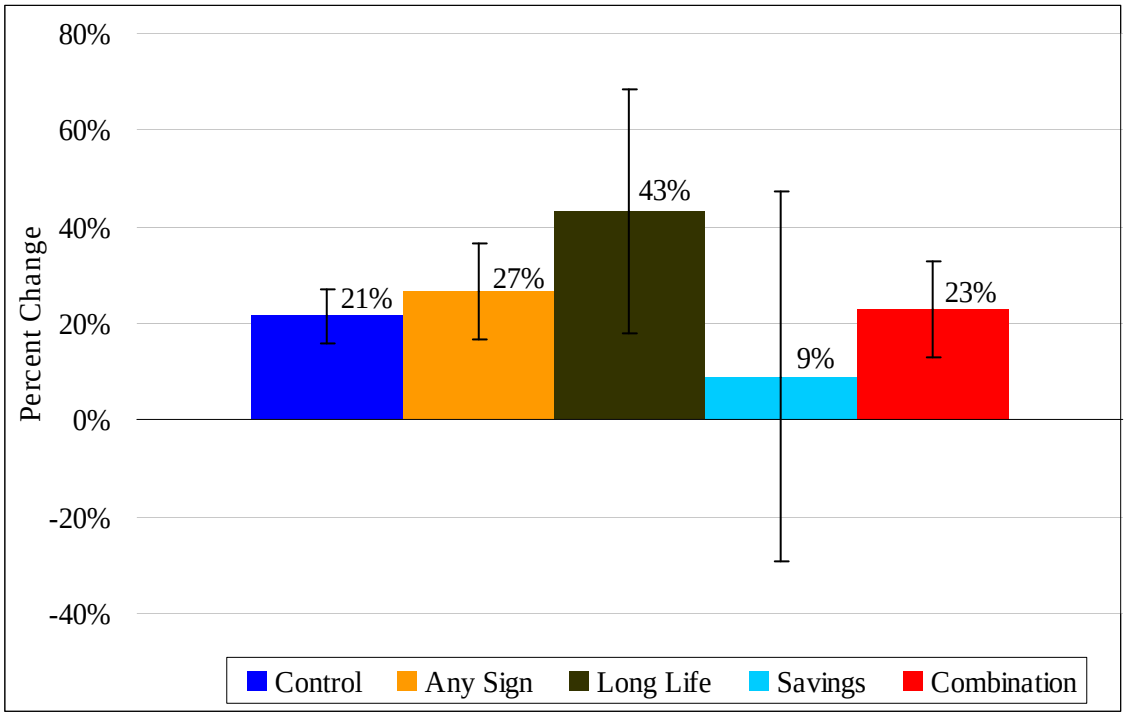
Findings

We compared CFL unit sales when experimental signage was in place with sales during the same period one year earlier. We first computed the average percentage change in each group and compared those values (Figure 2). We then used linear regression techniques to control for other differences between stores, including store type, CFL sales volume, and geographic region. The regression models we specified explained roughly half of the variation in the dependent variable (percentage change in CFL sales). These analyses produced interesting results, some expected and some unexpected.

First, only the long-life sign was clearly linked to increased sales. In those stores that contained experimental signage, average unit sales increased between 9% and 43%, compared to 21% in the control group. Of the three sign types (treatments), only the sign featuring the long-life message was associated with an increase in sales relative to the control group. In the subset of stores that contained long-life signs, sales increased 43% on average, compared to 21% in the control group, a difference of 22 percentage points. This difference was statistically significant at the 10% level. A linear regression model, which controlled for differences between stores other than differences in the presence and type of experimental signage, was used to test the strength of the relationship between each type of sign and sales. In this model, long-life signage was associated with a 15-percentage point greater increase in sales when compared with no signage. This difference was also statistically significant at the 10% level. Thus, in both models, the long-life signs were associated with statistically significant increases in sales.

Second, neither the cost-savings sign nor the combination sign, which featured both messages, were effective. Sales increased 9% and 23% on average in those stores that contained savings signs and combination signs, respectively. However, neither group outperformed the control group. In the linear regression model, the savings and combination signs were only weakly related to sales.

Figure 2. Change in CFL Unit Sales: Treatment Period Versus One Year Earlier



Source: D&R analysis of sales data provided by participating retailers

Third, we observed a much greater increase in sales in four stores where CFLs were being offered at deeply discounted prices and were receiving promotional placement. During the time that experimental signage was in these stores, Arizona Public Service ran a CFL buy-down promotion throughout its service territory. The buy-down lowered the price of CFLs to nearly that of incandescent bulbs, with many available for as little as one dollar. The effects on the Arizona stores were tremendous, with year-to-year sales increasing 61%, 314%, 361%, and 706% in the four affected stores. These results show the dramatic effects of the buy-down on short-term CFL sales. Because these four stores experienced such large increases in sales, they were excluded from the final analysis so as not to overwhelm the rest of the data.

Conclusions

The data offer evidence in support of the hypothesis that compelling point-of-purchase messages alone can contribute to measurable increases in sales of CFLs.

The particular sign we tested that used only the long-life message increased CFL sales when used at point of purchase. While one of our initial objectives was to differentiate between the effectiveness of the long-life and cost savings messages, shoppers were presented with signs

that included many elements other than the message. While the overall look and feel was consistent among the three test designs, each sign had unique design characteristics and differed with respect to image, text placement, and font size. These differences are likely to have contributed in some degree to the overall impact of the sign. We can only definitively conclude from this evidence that the particular savings and combination signs we tested were ineffective, not the savings and combination messages per se. In fact, a sign's overall design may be even more important than the message it conveys. A sign's effectiveness is certainly context sensitive as well. In the office, we may define the communication as ending at the borders of the sign, but in the store, the sign's context can insert new elements. For example, research on the contrast effect would predict that the $150 savings will seem much less significant to a shopper at a home improvement center where many of the single items for sale cost that much than to a shopper at a supermarket where most of the items cost less than $5. As a result, program implementers should take these factors into consideration at the design stage.

We are unable to draw definitive conclusions about the relative impacts of each of the messages due to a few important limitations of this study. First was the small sample size. Ordinary least squares regression models with multiple controls are typically used in cases where there are hundreds, if not thousands, of observations. Due to budget and time constraints, we were able to include only a relatively small number of stores in this study.

Second was the presence of uncontrolled factors. There were undoubtedly many unobserved differences between stores that were related to CFL sales that could not be accounted for in the analysis. In addition, a number of changes affecting the stocking and display of CFLs took place in some of the stores in the sample during the time of the study; these changes may also have affected CFL sales.

Last, but perhaps most important, is the limitation discussed above: that differences between the signs other than the messages are likely to have contributed in some degree to the overall impact of the signs.

Our approach could usefully be replicated elsewhere and extended to address some of the limitations of this study. Future research should test additional signage designs and message variations. Researchers must be cognizant of differences in sales environments, as a POP strategy that works well in one setting may not work well in another.

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