



The mediating effects of perception and emotion: Digital signage in mall atmospherics

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ABSTRACT

Digital signage (DS), public screens showing video, is an important, little-researched topic. The “direct” route in the elaboration likelihood model suggests that DS influences cognition, which then influences emotions whereas the “peripheral” route is emotion→cognition. We predict that these operate in parallel and report a survey of mall consumers ($n=315$). DS has a significant, positive, total effect on approach behaviors, mediated by positive affect and (arguably) perception of mall environment. Results extend the limited capacity model of mediated message processing from television to DS, which predicts the effectiveness of vivid moving visual images as atmospheric stimuli.

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1. Introduction

Despite academic research and practitioner experiments over a considerable period (see Turley and Milliman, 2000), the mechanisms by which people perceive stimuli and convert those perceptions into actions are still not fully understood. This paper addresses the mechanisms through which a stimulus acts by changing consumers’ perceptions of a mall and increasing emotions such as pleasure and arousal. Given the competitive nature of malls, and the current economic pressure, for a retail mix to be successful, the retail strategy will necessitate continuous improvements to a range of factors, including those making up atmosphere. This paper explores how mall managers can manipulate stimuli using an exemplar stimulus to increase consumers’ “approach” behaviors (i.e., the extent to which shoppers approach or avoid perceived stimuli). In the retail context, approach behaviors may include, for example: spending, intention to revisit and frequency of visits. The stimulus used in this research consists of digital signage, sometimes known as a digital communications network (DCN), or private plasma screen network. Digital signage consists of screens in a public place

showing video. Content typically includes (e.g.) advertisements, community information, entertainment and news. TV screens have been used in retail environments for some time but since the advent of digital control and flat screens, the use of networks of screens has made digital signage available as an effective, easily controlled communication medium. Referring to digital billboards, the Outdoor Advertising Association of America describes them as: ‘... updated electronically through a variety of methods. Some are networked together, most are operated remotely, and all of them can be updated quickly, sometimes with just the click of a mouse. This ability gives digital [signage] flexibility and nimbleness. This nimbleness gives local businesses a unique and powerful way to reach a large number of geographically targeted consumers very quickly’ (OAAA, 2009).

According to Point of Purchase Association International (POPPI), more than 70 percent of purchase decisions are made in store at the point of purchase (Jugger, 1999). Digital signage therefore aims to talk to shoppers while they are captive and in the mood to buy. Retailers in countries including the US (e.g. Albertson’s, Kroger, Target), the UK (e.g. Asda, Harrods, Sainsbury, Tesco,) and China (e.g. Carrefour) have launched digital signage networks. In addition to pushing merchandise, digital signage also generates hefty advertising revenues. Brand manufacturers pay anywhere from \$60,000 to \$293,000 for a 4-week campaign on Wal-Mart’s TV network connecting more than 2500 stores (The Economist, 2006). Although research figures are sparse, industry insiders estimate that digital signage is worth around \$2billion in the US (Computerworld.com, 2008).

Digital signage might be considered as part of “atmosphere”. Leo J. Shapiro & Associates, the firm that conducts store

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atmospherics surveys for *Chain Store Age* (Wilson, 2005) categorizes in-store TV among interactive atmospheric elements helping retailers building a competitive advantage. Research indicates that although consumers are generally satisfied with the convenience, quality, selection and value of today's retail offers, they would welcome more product information (Burke, 2002). Shoppers tend to consider that they would benefit from technological innovations such as electronic shelf-edge displays (a special case of digital signage) and product information kiosks (which parallel digital signage) (Burke, 2002).

Digital signage is thus an important tool for retail atmospherics. Yet, there is little scholarly research into digital signage (for an exception, see Newman et al., 2006). This study therefore sets out to address this research gap. The paper aims to make a theory contribution by exploring processes by which digital signage influences perception of mall environment, affect and approach/avoidance behaviors. There are important implications for mall owners and for retailers, as, if digital signage can be demonstrated to enhance perceptions of a mall environment, research demonstrates that shoppers transfer perceptions of the mall environment to the store images of individual retailers (Chebat et al., 2006), which may significantly impact revenue. On the other hand, digital signage content might be designed to elicit positive emotions directly. People who are in a good mood may have a better perception of the retail offer and consequently spend more (Puccinelli, 2006).

The remainder of this paper is organised as follows. In the following section, we outline the conceptual framework, addressing the extended role of shopping malls beyond simply supplying products, then retail atmospherics, followed by the application of retail atmospherics to shopping malls. This leads on to consideration of the limited prior research on digital signage, where we set this topic within theory frameworks of the limited capacity model of mediated message processing (LCM) and elaboration likelihood model (ELM). We then develop hypotheses concerning the effectiveness of digital signage. Next, we outline the method, model and measurement scales that we use to test the hypotheses. In the 'Results' section, we test the hypothesized model and alternatives, exploring the mechanisms by which digital signage influences shoppers' approach behaviors such as spending. After addressing the necessary limitations of the study and suggestions for further research, we discuss the results, drawing conclusions and commenting on the implications.

2. Conceptual framework

2.1. The role of the shopping mall

Shoppers, of course, use the shopping mall as a convenient way to obtain goods and services. Nevertheless, as we demonstrate in this section, consumers also patronize shopping malls for many less-utilitarian purposes. For example, shopping frequency in malls is correlated with (among other variables) recreation (Roy, 1994); and propensity for unplanned purchases is influenced by hedonic as well as utilitarian considerations (Chebat, 1999). Personal life values also influence mall patronage (Shim and Eastlick, 1998). Shoppers patronize shopping centers for walking and exercise (Hangland and Cimbalò, 1997) and as a social and recreation meeting place (Graham, 1988). The shopping mall is considered as a public place for community development among non-shoppers (Lewis, 1990), for the construction of social links (Aubert-Gamet and Cova, 1999), a city within a city (Backes, 1997) and as an ecological habitat for consumers (Bloch et al., 1994). Enjoyment and entertainment are important benefits of shopping (e.g. Babin et al., 1994; Sit et al., 2003; Yoo et al., 1998),

valued by consumers, and reflected in their spending (e.g. Donovan et al., 1994; Jones, 1999; Machleit and Mantel, 2001; Sherman and Smith, 1987; Smith and Sherman, 1993).

Against this background of substantial hedonic motivations for shopping, many older malls have difficulty competing against more modern ones (Reynolds et al., 2002). The importance of the physical environment has long been recognized (Baker, 1998; Baker et al., 1994, 2002; Bitner, 1990, 1992; Theodoridis and Chatzipanagiotou, 2009) and has more recently been extended to that of the shopping mall (e.g. Chebat and Morrin, 2007). Ways that malls can compete include improving the mall environment, making it more pleasurable place to spend time there, resulting in customers wanting to stay longer and spend more money (Wright et al., 2006). The next sub-section briefly reviews prior research into ways that marketers can improve the environment and positively influence shoppers by manipulating atmospheric stimuli.

2.2. Retail atmospherics

The capacity to alter in-store behavior through retail atmospherics is well known by retailers and researchers (e.g. Turley and Milliman, 2000). Retail atmospherics can be adapted to enhance the likelihood of triggering particular shopping behaviors. A wide spectrum of shopping behaviors can be influenced in a variety of retail formats. Appropriate music, in particular, has a positive effect on patronage across a range of retail contexts (Garlin and Owen, 2006, in a meta-analysis). Examples include: manipulation of music styles and tempos that impact sales in supermarkets (Herrington and Capella, 1996; Morin et al., 2007); impulse buying in department stores (Yalch and Spangenberg, 1990); responses to waiting in banks (Hui et al., 1997); sales in wine shops (North et al., 1999); and music "fit" on perceptions of an apparel brand (Beverland et al., 2006).

Other examples of patron responses to retail atmospherics include: increased sales due to effective exterior store windows (Edwards and Shackley, 1992); the effect of lighting on the number of items handled by shoppers and time spent at a display (Summers and Hebert, 2001); store layout on price perceptions (Smith and Burns, 1996); merchandise arrangement on purchase intentions in a wine store (Areni et al., 1999); and gender-appropriate scent on perceptions of apparel store environment, merchandise and approach behaviors such as spending (Spangenberg et al., 2006).

Apart from in-store behavioral response, retail ambiance influences a variety of consumers' emotions and attitudes: the effect of crowding on shopper satisfaction (Machleit et al., 1994); the mediating effect of the environment on the affective reactions of department store shoppers (Sherman et al., 1997); the influence of color on furniture store displays (Babin et al., 2003); the impact of the general environment on store image of a card and gift store (Baker et al., 1994); the effect of facilities and product assortment on consumers' pleasant emotions (Yoo et al., 1998); and the effect of redesigning the environment of a dental office on service satisfaction (Andrus, 1986). Babin and Darden (1995) also observe that the effect of a store atmosphere might be mediated by a consumer's general shopping style thus producing various reactions from different segments of consumers.

2.3. Mall atmospherics

We predict that mall atmospherics will not only contribute to building mall traffic, but also promote sales and additional spending. Based on the environmental psychology paradigm (Foxall and Soriano, 2005; Mehrabian and Russell, 1974), a shopping-congruent atmosphere is expected to put consumers

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