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Chewing increases consumers' thought-engagement during retail shopping☆,☆☆

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A B S T R A C T

In five studies, we conclude that chewing gum may be an effective way to increase consumers' thought-engagement while shopping. First, consumers chewing gum spend more time and report more thoughts than those who were not chewing gum, demonstrating the "chewing effect". We also find that chewable candies have similar effects as chewing gum. Second, chewing more increases the viewing time and variety-seeking behavior among consumers. However, chewing too much gum decreases individuals' focus, eliminating the "chewing effect". Finally, the chewing effect is mitigated when consumers are under high cognitive load. These results are tested in laboratory settings and in a field setting (grocery store). Overall, this exploratory research demonstrates the applicability of using chewing gum (or chewable candies) as an effective way to enhance consumers' thought-engagement in a retail context.

1. Introduction

Retail researchers have long focused on influencing consumer decisions (Ailawadi and Keller, 2004). Retail managers maneuver site location (Langston et al., 1997), store atmosphere (music, design, lighting, ambience, smell, etc., see Baker et al. (2002)), price perceptions and promotions (Bucklin and Lattin, 1992; Monroe and Lee, 1999), service offerings (Brown, 1969), and assortment (Inman et al., 2004) to influence consumers' thought-engagement, perception of the store, the money they spend, and the time they occupy in the store.

Increasingly, retailers are using physical goods (e.g., food and drinks) as a way to influence consumer behavior (e.g., sampling, demos). In the past, the use of physical goods has mostly been used to promote current brands or products that exist within the store, to entice customers to buy products, or to reinforce brand loyalty (Bawa and Shoemaker, 2004; Jain et al., 1995; Wu, 2010). However, research demonstrates that there are additional uses of physical goods aside from sampling. For example, retailers can use physical goods to help reduce uncertainty in a product purchase before committing to purchase (Heiman et al., 2001). Aside from helping consumers to make decisions, trials and demos can help consumers to form stronger cues of beliefs (thoughts) and attitudes towards products (Marks and Kamins, 1988); it also leads to higher attitude-behavior consistency (Smith and Swinyard, 1983). In sum, the use of physical goods is not only reserved for promoting a specific product or increasing awareness, but it can also be used as a way to alter consumer's overall shopping behavior (getting consumers to spend more time and/or producing greater number of thoughts). Hence, there are reasons to believe that retailers can make use physical goods as a way to increase cognitive activity among consumers during their shopping activity.

Here, this research investigates retailers' uses of chewing gum (a physical good) on consumers' thought-engagement. Herein, when referring to thought-engagement, we focus on two particular elements: time spent on thinking and number of thoughts formed. Research in social cognition shows mental, cognitive activities are grounded in physical experiences of the world (Williams et al., 2009). This parallel's an old Buddhist adage that "Body and mind have been brought together" (Varela et al., 1991, pg. 27). That is, sensorimotor experiences (i.e., chewing) serve as a foundation for development of goals and concepts (i.e., thoughts) such that our thoughts are not disconnected from the physical bodily context in which they occur (Niedenthal et al., 2005). In past literature, activation of motor movements increase accessibility to thoughts and feelings related to that specific motor movement (Barsalou, 2008; Niedenthal et al., 2005). That is, sensorimotor experiences often serve as a gateway for increased cognitive activity (Williams et al., 2009). In other words, motor movements such as chewing may function as a way to increase cognitive activity among shoppers. Additionally, it can also lead to seeking variety of choices

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(Levav and Zhu, 2009).

In this exploratory research, the focus is to demonstrate how chewing gum can be an effective physical good to enhance consumers' engagement with other store products. We first elaborate on the benefits of chewing (and chewing gum), then propose four research questions to understand the mechanism between chewing and cognitive activity. We then show five studies (4 laboratory studies and 1 field study) to demonstrate this link.

2. Chewing and thinking

The benefits of chewing gum date back through the centuries in various forms. For example, there is evidence that Northern Europeans chewed birch bark tar approximately 9000 years ago, not so much for enjoyment but for medicinal purposes, such as to relieve toothache (Nix, 2015). In the New World, the Mayans chewed chicle, a gum from sapodilla tree, which also served as band-aid for cuts (Fiegl, 2009). Further, chewing sugar-free gum after a meal has been shown to reduce incidents of dental caries (development white spots) (Kandelman and Gagnon, 1990; Beiswanger et al., 1998; Szöke et al., 2001) and promote the remineralization of enamel damage (Leach et al., 1989). Chewing sugar-free gum has been attributed to stimulation of salivary flow (Jenkins and Edgar, 1989), which increases plaque pH (Yankell and Emling, 1989) for availability of calcium and phosphate ions (Leach et al., 1989), food debris clearance (Addy et al., 1982). In other words, chewing gum protects teeth against plaque and cavity formation. Research has also shown that chewing gum positively affects postural stability (Kushiro and Goto, 2011). Finally, chewing gum reduces stress, fatigue, anxiety and depression (Smith et al., 2012) and might have a possible effect on stress coping (Konno et al., 2016). Together, chewing gum has been known to benefit the bodily function of individuals.

Recently, there has been a considerable interest in how chewing gum benefits humans at a cognitive level (Johnson et al., 2011; Kozlov et al., 2012; Smith, 2009, 2010; Smith and Woods, 2012). Chewing gum also elevates individuals' alertness, arousal, and mood (Smith, 2009, 2010). Masticating, or in lay terms, chewing, is a voluntary operation carried out by voluntary muscles through a command of our thinking (Smith, 1865). However, it is not an innate characteristic as it must be learned, but once it's learned, it gains a reflexive function, which demands further involvement from the nervous system (Markovic et al., 1999). In explaining these effects, researchers have used neural and biological methods to explain the effects of chewing gum on human responses. Chewing gum increases cerebral activity and enhances the delivery of oxygen and glucose to neural regions in the brain (Hirano et al., 2008; Stephens and Tunney, 2004; Onozuka et al., 2002). Positron emission tomography (PET) scans and functional magnetic resonance imaging (fMRI) studies show that chewing increases blood flow to the bilateral parietal and frontal lobes (Fang et al., 2005; Houcan and Li, 2007; Onozuka et al., 2002). Together, increased stimulation of the brain seems to be the mediating explanation for these effects.

Recent articles in press publishing have hinted at a direct correlation between chewing gum and learning. Particularly, chewing gum has been linked to sustain attention, increased cognitive function (Chen et al., 2015) and concentration performance in children (Tanzer et al., 2009). First, concept of chewing is strongly associated with cognitive function such as learning, memory, and intellectual functioning (Scholey, 2004). Allen and Smith (2015) determine that gum chewing during the workday showed results in higher productivity, fewer cognitive problems, and raised cortisol levels in the morning, suggestive that gum chewing enhances worker performance. Hence, it is not surprising that chewing is an important factor (especially for the elderly) in preserving cognitive function (Chen et al., 2015). Moreover, chewing gum improves task performance and raises alertness levels; it has been shown to increase people's level of sustained attention (Johnson et al., 2013). It also has a significant and positive effect on concentration performance (Tanzer et al., 2009). Further, in Hirano et al. (2008) paper, they examined the effects of chewing on neuronal activities in the brain during a working memory task using fMRI. The results demonstrate that chewing accelerate the process of working memory and increases arousal level. Taken together, prior literature demonstrates a concrete link between chewing and increased cognitive function.

3. Overview of research

Given these purported benefits, we are not aware of any research that directly investigates the benefits of chewing gum in a retail context. Given that consumers' thought-engagement (i.e., length of stay, variety seeking behavior) are beneficial to retailers, in this exploratory study, we investigate the benefits that chewing has on consumers' thought-engagement. More importantly, we explore the nuances of using chewing gum as an effective tool to increase consumers' thought engagement. Therefore, we not only want to confirm the linkage between chewing and thought-engagement, but do so in a retail context. To that end, we propose four research questions to investigate this phenomenon.

RQ1) Do consumers spend more time with the retailer and produce more thoughts about products if they are chewing gum vs. *if they are not?*

RQ2) Does chewing more lead to greater thought-engagement?

RQ3) What happens to consumers' thought-engagement if chewing becomes difficult?

RQ4) Does cognitive load impede the thought process thereby mitigating the effects of the chewing?

4. Pilot study: RQ1

In this pilot study, 48 undergraduate students (38% females, mean age=20.79) participated in this experiment via a university-sanctioned participant pool for a partial course credit. Upon entering the lab, participants were randomly assigned to one of two conditions. In condition A, participants received a piece of chewing gum (Hubba Bubba Bubble Gum). This group of students was instructed to chew the gum for the duration of the study. The other group, condition B, was the control group. Then, the participants were asked to imagine (a simulated shopping experience) that they were shopping at an online retailer for a book. The website recommended three books (horror, romance, and adventure) that were listed as this month's top-sellers. Participants were then provided with an image of the book covers and a description/abstract about the three books (all three books were fictitious, which removes the possibility of prior knowledge of the books creating knowledge bias). Participants were then asked to compare and contrast these three books. Participants were given 10 blank spaces where they could record their thoughts (positive or negative) about the books. Participants were also asked to pick a book to purchase for themselves (book choice was not significantly different across the two conditions). Finally, the dependent variables were the number of thoughts produced and how long the participant took to complete the exercise. None of the participants indicated any suspicion about the experiment's true intentions. Additionally, while subject preference (horror, romance, and adventure), as well as demographic variables (age, gender) were collected, these did not have any influence on the final results.

Independent T-test analysis revealed that subjects in the chewing gum condition (vs. control) reported more thoughts (M *gum*=4.79 (SD=2.54) vs. M *control*=3.29 (SD=2.03); t=2.26, $p < .05$, d=.65) and spent more time (in seconds) formulating these thoughts (M