

**Does that Sound Smell Good?**  
**An Experimental Investigation into the use of Verbal Smell References and Cooking**  
**Sounds in Radio Advertisements**

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Sounds

## **Does that Sound Smell Good?**

### **An Experimental Investigation into the use of Verbal Smell References and Cooking**

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#### **Abstract**

In an industry plagued by high failure rates and exorbitant amounts spent on marketing, restaurants must find ways to increase the efficiency of their advertising. Present research demonstrates linkages between human senses and emotions and affective responses to marketing stimuli (e.g. Peck and Wiggins, 2006). However, there is presently a dearth of research addressing how advertising can creatively draw upon consumers' senses to elicit the desired responses by stakeholders (e.g. increased purchase intent). In response to this apparent gap in our inquiry, the purpose of this study is to explore how verbal smell references (e.g. "You can almost smell the smoky and delicious aroma of your steak grilling to perfection" stated in the ad) and congruent cooking sounds (e.g. sizzling sounds for a steakhouse) in radio food advertisements impact consumer sensory perceptions (ability to almost taste and/or almost smell the advertised product), affective response, and purchase intentions. In addition, since current research indicates that olfactory perceptions can vary by gender (e.g. (Doty, Shaman, and Dann, 1983; Cane, 1982), this research tested for gender-based differences in these hypothesized relationships.

Regarding procedures, a sequence of two pretests were used to establish the reliability and validity of the verbal smell reference used in this research. In addition to these manipulation

checks on the verbal smell reference construct, the two pretests also verified that undergraduate students would have the ability to adequately relate to the experimental setting – steakhouses. Next, a 2x2x2 between-subjects experiment was conducted in which the verbal smell reference was manipulated, congruent cooking sounds were manipulated, and gender was measured. Results indicate that a verbal smell reference in a radio ad does significantly influence a potential consumer's ability to almost smell and to almost taste the advertised product. The smell reference also significantly impacts individuals' affective responses to the ad and purchase intent of the product. Interestingly, this research also found that the level of 'excitement' associated with the advertised brand perfectly mediates the relationship between the verbal smell reference and affective responses. That is, the verbal smell reference leads consumers to assess the advertised brand as being exciting which, in turn, results in positive affective responses.

This research did not detect any significant outcomes associated with the use of congruent cooking sounds in radio ads or any significant interactions between cooking sounds and verbal smell references with regard to the outcome variables. Further, gender was not found to significantly intervene in any of the hypothesized relationships. Nevertheless, the significant outcomes associated with the main effect of the verbal smell references on consumer sensory perceptions (ability to almost taste and/or almost smell the advertised product), affective response, and purchase intentions, along with the mediation of the excitement construct, are associated with formidable theoretical and managerial implications which are discussed in the concluding chapter of this thesis.

*To my Grandparents, June and Jerry Miller, and Glenn and Gloria Davis, who I have been blessed to have for so many years.*

## **Acknowledgements**

When I meet people for the first time, they are curious about what I do. I explain to them that I work three part-time jobs, have a graduate assistantship, take graduate level courses and am completing a Master's Thesis. They have a look of shock and ask some variation of "How do you find time to do all of that?" My answer is simple; I have a strong base of support from friends and family. The completion of this thesis is no different. There are many whom I would like to thank for opening their personal schedules, offices, and classrooms. Without your support, this project would not have been possible.

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## Table of Contents

<b>Abstract</b>	i
<b>Dedication</b>	iii
<b>Acknowledgements</b>	iv
<b>Table of Contents</b>	vi
<b>List of Figures</b>	ix
<b>List of Tables</b>	x
<b>Chapter I</b>	1
<b>Introduction</b>	1
Statement of the Problem	4
Objectives	6
Research Questions	7
Proposed Hypotheses	8
Summary	10
<b>Chapter II</b>	11
<b>Literature Review</b>	11
Introduction	11
The Effects of a Verbal Smell Reference in a Radio Advertisement	11
The Effects of Congruent Cooking Sounds in a Radio Advertisement	16
The Interaction of Verbal Smell References and Congruent Cooking Sounds	18
Moderating Influence of Gender on the Effects of a Verbal Smell Reference	20
Summary	22
<b>Chapter III</b>	24
<b>Research Design and Methodology</b>	24

Introduction	24
Objectives	24
Research Questions	25
Proposed Hypotheses	26
Pretest I Procedures	28
Pretest II Procedures	29
Main Study Procedure	29s
Measurement of Variables	30
Analysis	34
<b>Chapter IV</b>	<b>37</b>
<b>Results</b>	<b>37</b>
Introduction	37
Pretest I	37
Pretest II	39
Main Study	41
Scale Reliabilities	45
Hypothesis Testing	45
Further Testing the Theoretical Support for H1	51
<b>Chapter V</b>	<b>54</b>
<b>Discussion</b>	<b>54</b>
Introduction	54
Conclusions	54
Theoretical Implications	57
Managerial Implications	59
Limitations and Suggestions for Future Research	61



<b>References</b>	64
<b>Appendix A: Pretest I Survey</b>	72
<b>Appendix B: Pretest II Survey</b>	75
<b>Appendix C: Main Study Survey</b>	78
<b>Appendix D: IRB Approval Letter</b>	88
<b>Appendix E: Radio Ad Scripts</b>	90

## List of Figures

Figure 2.1: Possible Antecedents of  $A_{AD}$

14

## List of Tables

Table 4.1: Frequencies of Smell Adjectives	38
Table 4.2: On average, how many times per year do you typically eat at steak houses?	38
Table 4.3: On average, how many times per year do you typically eat at full-service restaurants?	39
Table 4.4: On average, how many times per year do you typically eat steak?	39
Table 4.5: Descriptive Statistics of Verbal Smell Reference Suitability	40
Table 4.6: On average, how many times per year do you typically eat at steak houses?	40
Table 4.7: On average, how many times per year do you typically eat at full-service restaurants?	41
Table 4.8: On average, how many times per year do you typically eat steak?	41
Table 4.9: On average, how many times per year do you typically eat at steakhouses?	42
Table 4.10: On average, how many times per year do you typically eat at full service restaurants?	43
Table 4.11: On average, how many times per year do you typically eat steak?	43
Table 4.12: Treatment Group Descriptive Statistics	44
Table 4.13: Scale Reliabilities	45
Table 4.14: Multivariate Tests	47
Table 4.15 Univariate Tests	47
Table 4.16 Tests of Between-Subjects Effects	50
Table 4.17 Verbal Reference Regression Coefficient on Affective Response	53
Table 4.18 Excitement Regression Coefficient on Affective Response	53
Table 4.19 Excitement Regression Coefficient on Affective Response controlling for Verbal Reference	53

## **Chapter I**

### **Introduction**

Few would refute that the restaurant industry is big business. As with most big business, the industry makes sizeable investments into advertising. In the United States, the amount spent on advertising in the restaurants industry continues to grow, roughly \$3.89 billion was spent on advertising in 2008 alone (The Nielsen Company, 2009). Despite these sizable advertising expenditures, restaurant failure rates are quite high. Parsa, Self, Nijite, and King (2005) report that 25 percent of restaurants fail during their first year of operation and 90 percent fail by year three.

Myriad forces drive this high restaurant failure rate, but one contributing factor is most certainly advertising clutter (Magnini, Garcia, and Honeycutt, 2010). With the continuing integration of technology into everyday life, consumers are being exposed to increasing amounts of advertising on a daily basis (Marsden, 2006; Pringle, 2004), creating what is known as advertising clutter (Riebe and Dawes, 2006). Consumers in turn, create mental blocks in an attempt to block this clutter (Rumbo, 2002). In other words, consumers sometimes feel overwhelmed by the constant tsunami of advertising messages, and consequently, consciously and subconsciously psychologically tune out the vast majority (Speck and Elliot, 1997). Because of this increasing clutter and the resulting consumer coping, marketers are having difficulty in making their target consumers aware of their advertisements (Pieters, Warlop, and Wedel 2002).

While advertising clutter is one of the most publicized issues in the advertising industry (McClellan, 2005; Steinberg, 2009), the common response strategy pursued by advertisers is not changing the effectiveness of advertisements, but instead increasing their frequency (Rotfeld, 2006). This increased frequency, in turn, triggers even more spending on the production of additional advertisements and their corresponding time slots in radio or television mediums, or page space in print media and decreases the realized returned revenues (Marsden, 2006). In television and radio advertising, there are two adopted advertising strategies by media programmers, high-clutter and low-clutter. The high-clutter strategy utilizes large advertising blocks between broadcasted content, resulting in about 12 minutes of advertising per hour, while low clutter results in about four minutes per hour (Riebe and Dawes, 2006). Certain limitations however, are being placed on the total length of television advertisements per hour. According to the Federal Communications Commission (2008) limitations are placed on advertising times in children's programming (10.5 minutes during weekdays, 12 minutes during weekends per hour of programming). Limitations not only for children's programming, but television broadcasts in general are occurring throughout the European Union (Batzeli, 2007).

Researchers have been interested in exploring gender roles in advertising for decades (See Courtney and Lockeretz 1971; Belkaoui and Belkaoui 1976; Kerin, Lundstrom, and Sciglimpaglia 1979). The purpose of much of this initial research was to ascertain empirical data determining the presence of gender-stereotypes in advertising. While gender-stereotypes remain a topic of academic interest (Cheng, 2008), research has seen a strong transition toward exploring the gender roles in advertising and their effects on consumers (Ndubisi, 2006; Fugate & Phillips, 2010). Barthel (1989) explains that many products ranging from cigarettes to snow boots have gender as part of their identity. This can also be applied to services (e.g. beauty

salons, restaurants, fitness facilities, etc.). Thus, it is becoming increasingly apparent by these emerging bodies of studies that advertisers do need to take into account the gender compositions of their target audiences when designing and airing ads as gender can exert significant influences on outcome variables such as affect and purchase intent.

Furthermore, every advertisement produced, regardless of medium, is intended to be received by one or more human senses (e.g. radio ad → auditory; print ad → visual; television ad → auditory and visual). As humans, our perception of objects that surround us depends upon information simultaneously reaching our senses (Neisser 1976; Driver and Spence 2000). Auditory stimuli are often triggered upon touch or interaction with everyday items; these sounds have the ability of transmitting useful information in regards to the item's properties (Foster, 1956; Gaver, 1993; Norman, 1998; Miśkiewicz and Letowski, 1999).

Our perceptions of food are also often developed through the confluence of sensory stimuli. Research finds that, in some respects, humans do eat with their eyes, and studies exist that focus on various aspects of this notion; for example, portion size and (Wansink & Park, 2001; Kral, Roe, Meengs, Wall & Rolls, 2002). However, little research to date has examined whether advertisements can subconsciously evoke sensory thoughts of taste or smell. This may not be an unrealistic proposition given the role of the subconscious in susceptibility to advertising: “When he (Freud) said that consciousness is the tip of the mental iceberg, he was short of the mark quite a bit – it may be more the size of a snowball of top of that iceberg” (Wilson, 2002, pp. 6). In fact, research has already concluded that advertisements can evoke perceived sight and touch sensory thoughts through pictorial and textual content (Phillips, Olson, and Baumgartner, 1995; Walters, Sparks, and Herington, 2007; Lee, Gretzel, and Law, 2009),

however, there is little research that explicitly examines whether advertisements can evoke a sensory taste or smell response.

### **Statement of the Problem**

Given the high failure rate in the restaurant industry (coupled with the simultaneous high levels of advertising expenditures), evidently any research that explores how restaurant advertising can be more effective in evoking intended consumer responses is both theoretically and managerially pertinent. As suggested by Parsa et al. (2005), restaurant failures are attributed to three perspectives: economic, marketing, and managerial. The majority of present research focuses on restaurant failure from the economic perspective (Kwansa and Parsa, 1990; Morse, 1999; Zheng & Gao, 2000; Zheng, 2002) which encompasses expenditures on advertising, while the effectiveness of advertising is placed in the marketing perspective.

Finding a universal definition for restaurant failure has complicated analysts and researchers for years because this definition varies from case to case citing recurring themes such as bankruptcy and change of ownership (Parsa, et al., 2005). In addition to these themes is the firm's inability to adapt and change to the needs of the consumer and market accordingly (Zacharakis, Meyer, & DeCastro, 1999). With Schifferstein and Tanudjaja's (2004) study showing the relationship between emotions and human senses which lead to positive affective responses (Peck and Wiggins, 2006) and radio advertising being a strong medium for evoking sensory responses (Russell and Lane, 1990), there is still a dearth of research addressing how advertising can creatively draw upon consumers' senses to elicit the desired responses. In response to this apparent gap in our inquiry, the purpose of this study is to explore how verbal

smell references and congruent cooking sounds in radio food advertisements impact consumer sensory perceptions, affective response, and purchase intentions.

In related a stream of research, Elder and Krishna (2010) find that multisensory ads can yield higher taste perceptions than ads focusing on taste alone. While useful and tangentially related to our study, Elder and Krishna's (2010) research conducted experiments within the packaged food sector as opposed to the restaurant sector. In another similar study, Magnini and Karande (2010) found that a written smell reference in a print ad (e.g. "Ecotourism at its Finest... Recreate, Rejuvenate, and *Enjoy the Fragrant Mountain Air* at the Graham Hotel") can influence individual's affective responses to the advertisement. Again, while useful and tangentially related to our study, Magnini and Karande's (2010) study was conducted on print advertisement in a tourism context as opposed to the radio advertisements in a restaurant context which is the focus of our study. Moreover, the Magnini and Karande (2010) study did not examine perceived taste because food was not a facet of the research design.

Thus, it is evident that much opportunity remains to extend this theoretically and pragmatically relevant body of research. According to a recent review of the literature, none of this existing research examines the influences that verbal smell references of cooking sounds in ads can have on consumer affect and behavior, nor do any extant studies consider the interactions between the two or the intervening role of gender. Oversaturation of ads, consumer fatigue and ad avoidance as a coping mechanism to this oversaturation, and the high failure rate of restaurants all deem this area of research ripe for extension. Both theoretical and practical implications can result from such research.



## Objectives

This study aims to achieve the following objectives:

1. Explore the link between verbal smell references in radio food advertisements and the consumer's ability to almost smell or taste the food, and its effect on affective responses and purchase intent.
2. Explore the link between verbal taste references in radio food advertisements and the consumer's ability to almost smell or taste the food, and its effect on affective responses and purchase intent.
3. Determine if verbal smell references and congruent cooking sounds in radio food advertisements in a single radio ad will exude greater positive influences on the consumer's ability to almost smell or taste the food, and its effect on affective responses and purchase intent.
4. Determine if verbal smell references in radio food advertisements will exude greater positive influences on a female's ability than a male's to almost smell or taste the food, and its effect on affective responses and purchase intent

## Research Questions

This study addresses the following research questions:

1. Do verbal smell references in radio food advertisements affect the consumer's ability to almost smell or taste the food, and what is its effect on affective responses and purchase intent?
2. Do verbal taste references in radio food advertisements affect the consumer's ability to almost smell or taste the food, and what is its effect on affective responses and purchase intent?
3. Do verbal smell references and congruent cooking sounds in radio food advertisements in a single radio ad exude greater positive influences on the consumer's ability to almost smell or taste the food?, and what are their effects on affective responses and purchase intent?
4. Do verbal smell references in radio food advertisements exude a greater positive influence on a female's ability than a male's to almost smell or taste the food, and what are the differing effects on affective responses and purchase intent?

### **Proposed Hypotheses:**

In response to the preceding research questions, based upon literature synthesized in Chapter II, the following research hypotheses are advanced in this thesis:

H1a: Using a verbal smell reference in a radio food advertisement will positively influence the listener's perceived ability to 'almost smell' the food when listening to the advertisement.

H1b: Using a verbal smell reference in a radio food advertisement will positively influence the listener's perceived ability to 'almost taste' the food when listening to the advertisement.

H1c: Using a verbal smell reference in a radio food advertisement will positively influence the listener's affective response to the advertisement.

H1d: Using a verbal smell reference in a radio food advertisement will positively influence the listener's purchase intent.

H2a: Using congruent cooking sounds in a radio food advertisement will positively influence the listener's perceived ability to 'almost smell' the food when listening to the advertisement.

H2b: Using congruent cooking sounds in a radio food advertisement will positively influence the listener's perceived ability to 'almost taste' the food when listening to the advertisement.

H2c: Using congruent cooking sounds in a radio food advertisement will positively influence the listener's affective response to the advertisement.

H2d: Using congruent cooking sounds in a radio food advertisement will positively influence the listener's purchase intent.

H3a: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener's ability to "almost smell" the food when combined in a single radio advertisement.

H3b: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener's ability to "almost taste" the food when combined in a single radio advertisement.

H3c: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener's affective response to the ad when combined in a single radio advertisement.

H3d: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener's purchase intent when combined in a single radio advertisement.

H4a: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's perceived ability to 'almost smell' the food than on a male listener's ability.

H4b: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's perceived ability to 'almost taste' the food than on a male listener's ability.

H4c: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's affective response toward the ad than on a male listener's response.

H4d: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's purchase intent than on a male listener's purchase intent.

## Summary

The oversaturation of marketing caused by advertising clutter requires firms to more effectively design their advertisements. What appears to be an untapped resource is the incorporation of sensory stimuli. To gain a better understanding of the effectiveness of including sensory stimuli in marketing strategies, this study will examine the effect that singular and multiple stimuli in a radio advertising environment to determine their efficacy. While the question: “Does that Sound Smell Good?” contained within the title of this thesis is an attempt to be lighthearted and humorous, the fact of the matter is that most of human’s thoughts, feelings, and actual behaviors are triggered by the subconscious. Thus, this thesis will build the case and then test whether a verbal smell reference becomes more potent when accompanied by congruent cooking sound, and vice versa. In addition, we will further research feminine gender superiority in olfactory perception and test if sensory stimuli have a differing effect as a result. The end result of this research endeavor will be a clearer picture of how particular audio stimuli (verbal smell references and cooking sounds) influence potential consumers’ sensory perceptions (ability to almost taste and/or almost smell the advertised product), affective response, and purchase intentions.

## **Chapter II**

### **Literature Review**

#### **Introduction**

As indicated in the previous chapter, this research directed toward exploring how verbal smell references and congruent cooking sounds in radio food advertisements impact consumer sensory perceptions, affective response, and purchase intentions. Specifically, this study will examine how consumers react to verbal smell references and congruent cooking sounds and the subsequent affect on a positive affective response. From this, we will explore whether there exists any correlations in relation to gender. In order to accomplish this academic endeavor, literature on the effects of verbal smell references in radio advertising, the effects of congruent cooking sounds in radio advertising, the interaction of verbal smell references and congruent cooking sounds, and influences on gender will be reviewed.

#### **The Effects of a Verbal Smell Reference in a Radio Advertisement**

The study of sensory perception within the marketing discipline has traditionally focused on the visual component (for a review see Krishna, 2007). Nevertheless, emerging research is increasingly finding that many types of sensory information can be communicated to potential consumers in well-crafted advertisements (Elder and Krishna, 2009; Magnini and Gaskins, 2010; Magnini and Karande, 2010). Through a series of experiments conducted within the context of the packaged food industry, for example, Elder and Krishna (2009) find that advertising copy can

significantly influence consumers' sensory thoughts and perceived taste of the given food. In a different study, Magnini and Gaskins (2010) demonstrate the inserting a written touch reference in a print ad (e.g. Visit the Newstead Cove Resort and *feel the soothing Caribbean sand and water* as you walk on our pristine award-winning beach) influences consumers' affective responses toward the advertisement. In the same year, Magnini and Karande (2010) also demonstrate that a written smell reference in a print advertisement (e.g. "Ecotourism at its Finest... Recreate, Rejuvenate, and *Enjoy the Fragrant Mountain Air* at the Graham Hotel") can influence individual's affective responses to the advertisement. Thus, using these studies as our foundation, this research seeks to extend these findings to a similar marketing channel: radio advertising. That is, we seek to extend existing knowledge by positing that a verbal smell reference can influence a listener's ability to 'almost smell' the advertised product.

Second, regarding the potential influence of the verbal smell reference and taste, we extend the above logic to contend that a verbal smell reference in a radio ad can also influence a listener's ability to 'almost taste' the advertised product. We make this contention because recent neurophysiological research lends even further support to the contention that every human sense plays a role in stimulating taste (Rolls, 2005; Small and Jones-Gotman, 2001). Smell and taste, in particular, go hand-in-hand (Elder and Krishna, 2009; Small and Prescott, 2005). In other words, smell is the key accompanying sense for taste (Dalton, Doolittle, Nagata, and Breslin, 2000; Small and Prescott, 2005). In fact, the nexus between taste and smell is so robust that without smell, when eating, it is difficult to tell the difference between an apple and a potato or between wine and apple juice (Herz, 2007). These distinctions are difficult to make without the sense of smell because olfaction affects taste both before and after food enters the human mouth (Rozin, 1982). This body of research serves as theoretical anchoring for the contention

that a verbal smell reference in an ad can have a positive influence on a consumer's ability to 'almost taste' the advertised food.

Third, emotions, specific feelings, moods, or evaluations are defined as affective responses (Peter and Olsen, 2002) which affect the attitudes and behavior of an individual (Peck and Wiggins, 2006). Since there is known to be a strong relationship between human senses and emotions (Schifferstein and Tanudjaja, 2004), this research predicts that a verbal smell reference in an ad can stimulate positive affect toward the advertisement. The theoretical and practical implications of this research are numerous: in an advertising context, triggering a positive affective response can reinforce existing attitudes (Aaker, Stayman, and Hagerty, 1986; Batra and Ray, 1987; Brown, Homer, and Inman, 1998) can increase viewing time (Olney, Hoolbrook, and Batra, 1991) and bolster a consumer's general attitude for a given brand (Brown, et al., 1998; Burke and Edell, 1989; Hoolbrook and Batra, 1983). In addition, research by Peck and Wiggins (2006) shows that behavior can be directly influenced by positive affective responses.

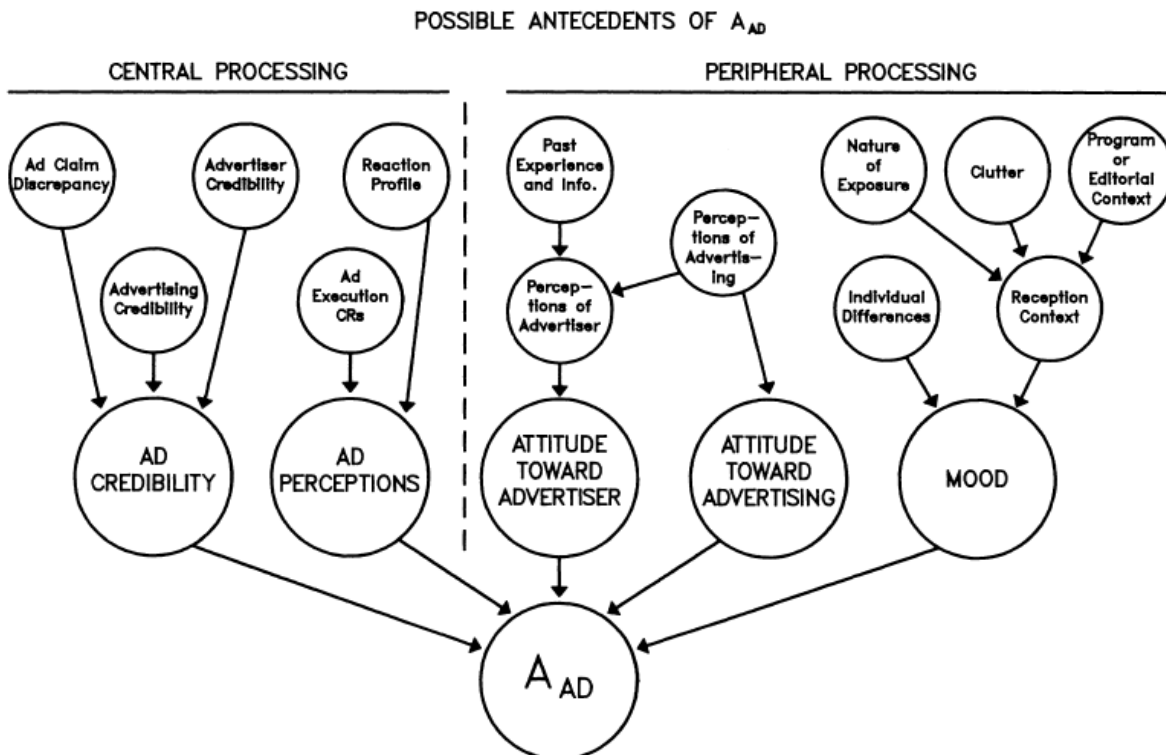
This research, in particular, contends that verbal smell references contained in an ad might create a more exciting feel surrounding the advertised restaurant as opposed to a restaurant that does not employ verbal smell references. In fact, Plummer (1985) contends that *any* exposure that an individual has with a brand influences his/her brand personality perceptions. This excitement spawned by the smell reference may, in turn, lead to positive affect. This logic is supported by an emerging body of research that suggests that 'staging' a brand to draw upon one's senses can influence perceptions of the brand's personality (Lindstrom, 2005; Magnini and Parker, 2009; Magnini and Thelen, 2008).

The notion that a verbal smell reference in an ad can have a positive influence on consumers' affective responses to the ad is supported by another body of research as well. That



is, according to Figure 2.1, a model proposed by MacKenzie and Lutz (1989), attitude toward an ad ( $A_{AD}$ ) is constituted of the credibility and perception of the ad, the attitude toward the advertiser and advertising, and mood. Of these five proposed determinants, our focus is on ad perception which is defined as a complex assortment of consumer perceptions of stimulated by an advertisement including beliefs associated with the ad, but not with the brand (Lutz, MacKenzie, and Belch, 1983). Therefore, because there is a strong relationship between olfactory perceptions and human emotion, and the relationship between the olfactory sense and human emotion is stronger than any of the five senses (Schifferstein and Tanudjaja, 2004), and positive emotions are linked to positive affective responses (Peter and Olson, 2002), we predict that a verbal smell reference in a radio ad can exude a positive influence on consumers' affective responses toward the advertisement.

Figure 2.1



Fourth, this research contends that a verbal smell reference in an ad can positively influence consumers' purchase intentions. Much research exists showing the correlation between information gathered from sensory perception and experiences to its effect on human behavior (Peck and Wiggins, 2006; Schifferstein and Tanudjaja, 2004), and the effect of sensory stimuli and an individual's reactions based on past experiences associated with such stimuli in satisfying their needs (Dalglish and Power, 2007; Leventhal and Scherer, 1987; Arnold, 1960). Olfactory perceptions and emotional influences have a stronger relationship than any other human function (Schifferstein and Tanudjaja, 2004). Research suggests that those who have positive affective responses toward an advertisement will also have positive attitudes toward the advertisement and the brand, which leads to higher purchase intent (Aaker, et al., 1986, Batra, 1984). Moreover, the notion that affective attitudes serve as a significant predictor of behavioral intentions is also supported by the widely cited theory of planned behavior [TPB]. According to TPB, individual's attitudes interact with subjective norms and perceived behavioral control (controllability) drive behavior intentions (Ajzen, 1985; 1991). Based upon each of the above discussions, the following research hypotheses are offered:

**H1a: Using a verbal smell reference in a radio food advertisement will positively influence the listener's perceived ability to 'almost smell' the food when listening to the advertisement.**

**H1b: Using a verbal smell reference in a radio food advertisement will positively influence the listener's perceived ability to 'almost taste' the food when listening to the advertisement.**

**H1c: Using a verbal smell reference in a radio food advertisement will positively influence the listener's affective response to the advertisement.**

**H1d: Using a verbal smell reference in a radio food advertisement will positively influence the listener's purchase intent.**

### **The Effects of Congruent Cooking Sounds in a Radio Advertisement**

Sound, in addition to smell, also affects perceived taste, the sound of food being eaten affects perceived quality and freshness (Zampini and Spence, 2004). As previously mentioned, auditory stimuli are often triggered upon touch or interaction with everyday items, these sounds have the ability of transmitting useful information in regards to the item's properties (Foster, 1956; Gaver, 1993; Norman, 1998; Miśkiewicz and Letowski, 1999). Thus, perceptions of food are also developed through these sensory stimuli.

With regard to the context of this study, congruent cooking sounds are defined as sounds and noise generated through the preparation of food (e.g. bacon sizzling on a skillet, cracking an egg, slicing vegetables, etc.). Sound effects are defined as devices or recordings used in radio and television to replicate sound (Russell and Lane, 1990). In radio advertising, there are three ways of evoking a sensory response: sound effects, vivid verbal messages, and specific instructions to listeners to imagine (Miller and Marks, 1997). Miller and Marks (1997), researchers at Washburn University and Kent State University respectively conducted experiments on 214 undergraduate students who were exposed to radio advertisements with and

without sound effects. They found that sound effects generate stronger influence in evoking a sensory response and positive feelings than verbal messages or instructions. As stated earlier, there is a strong relationship and human emotion and the human senses (Schifferstein and Tanudjaja, 2004), and positive emotions are linked to positive affective responses (Peter and Olson, 2002).

The inclusion of sound effects in radio advertisements increases the sensory perception, and when combined with a positive affective response, attitude toward the advertisement increases (Miller and Marks, 1992). As previously discussed, in the MacKenzie and Lutz (1989) model, ad perception is one of five determinants to the overall attitude of an advertisement. Research suggests that those who have positive affective responses toward an advertisement will also have positive attitudes toward the advertisement and the brand, which leads to higher purchase intent (Aker, et al., 1986, Batra, R. 1984). These streams of research provide theoretical support for the following hypotheses surrounding the influences of congruent cooking sounds:

**H2a: Using congruent cooking sounds in a radio food advertisement will positively influence the listener’s perceived ability to ‘almost smell’ the food when listening to the advertisement.**

**H2b: Using congruent cooking sounds in a radio food advertisement will positively influence the listener’s perceived ability to ‘almost taste’ the food when listening to the advertisement.**

**H2c: Using congruent cooking sounds in a radio food advertisement will positively influence the listener's affective response to the advertisement.**

**H2d: Using congruent cooking sounds in a radio food advertisement will positively influence the listener's purchase intent.**

### **The Interaction of Verbal Smell References and Congruent Cooking Sounds**

As Calvert, Spence, and Stein (2004, p. xi) state, "There can be no doubt that our senses are designed to function in *concert* and that our brains are organized to use the information they derive from their various sensory channels *cooperatively* in order to enhance the probability that objects and event will be detected rapidly, identified correctly, and responded to correctly." Since the human cognitive processes are structured in this fashion this research predicts that both verbal smell references and congruent cooking sounds will have stronger influences on consumer perceptions, affect, and behavior when one is in the presence of the other. That is, a verbal smell reference will have a larger impact in the presence of a cooking sound and vice versa.

Support for this contention is evidenced in an emerging stream of congruency research housed within the atmospherics literature. For instance, in a field experiment, Mattila and Wirtz (2001) created various levels of scent arousal and music arousal in a retail environment and found that congruency between the two elements bolstered consumer satisfaction with the shopping experience, approach behavior, and impulse buying. In a similar vein, Spangenberg, Grohman, and Sprott (2005) manipulated scent and music combinations in a simulated retail

environment and found that congruency between the two increased positive consumer sentiment toward the store, its merchandise, the store environment, and intentions to visit the store.

For years, researchers have been interested in the use of stimuli in influencing customer response and perception (Rossiter, 1982). Imagery has been defined as two things, “a mental event involving visualization of a concept or relationship” (Lutz and Lutz, 1978) and as “a process by which sensory information is represented in working memory” (MacInnis and Price, 1987). Imagery not only affects sight, but olfactory and taste as well; it is even possible for a person to experience a stimuli without the presence of the actual stimuli (Burns, Biswas, and Babin, 1993). The phenomenon known as “high elaboration” stems from the potential of imagery stored in long term memory into working memory (MacInnis and Price, 1987). Imagery also has the capability to affect multiple senses simultaneously, providing an increased amount of channels for information to pass which generates higher affective responses (Lutz and Lutz, 1978; Rossiter, 1982).

As previously enumerated, according to the MacKenzie and Lutz (1989) model, ad perception is one of five determinants to the overall attitude of an advertisement. Research suggests that those who have positive affective responses toward an advertisement will also have positive attitudes toward the advertisement and the brand, which leads to higher purchase intent (Aker, et al., 1986, Batra, 1984). In other words, liking for an ad is often transmitted into liking for the product or brand itself. Therefore, based upon the logic that supports this causal linkage, it is hypothesized that:

**H3a: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener’s ability to “almost smell” the food when combined in a single radio advertisement.**

**H3b: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener’s ability to “almost taste” the food when combined in a single radio advertisement.**

**H3c: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener’s affective response to the ad when combined in a single radio advertisement.**

**H3d: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener’s purchase intent when combined in a single radio advertisement.**

### **Moderating Influence of Gender on the Effects of a Verbal Smell Reference**

This research also predicts that verbal smell references will have a larger influence on female perceptions, affect, and purchase intent than on male outcomes. This prediction is advanced for two reasons. First, a sizable body of research demonstrates that men and women respond to advertising stimuli differently (Magnini and Gaskins, 2010; Meyers-Levy, 1985; Meyers-Levy and Sternthal, 1991; Orth and Holancova, 2004; Prakash, 1992; Stern, 1993;

1999). For example, there is strong evidence to suggest that in many situations females are apt to react with more emotions to advertising than males (Fisher and Dube, 2005). These emotion-laden responses can be attributed to the fact that self-reports reveal that females have more frequent (e.g. Feldman Barrett et al., 1998) and intense emotional feelings than males (e.g. Birnbaum, Nasonchuk, and Croll, 1980). It has also been reported that females are often more attuned to their emotional states (Allen and Haccun, 1976) and assign more weight to such feelings (Dube and Morgan 1998).

The second reason why we predict that verbal smell references will have a larger influence on female perceptions, affect, and purchase intent than on male outcomes is because research suggests that females dominate over males in odor identification (Doty, Shaman, and Dann, 1983; Cane, 1982). This research is also substantiated across multiple cultures/ethnicities (Doty, Applebaum, Zusho, & Settle, 1985). This female superiority is attributed to differing hormone actions in the central nervous system during puberty and prenatal development (Doty, 1986). Due to the smell identification ability, according to the selective-retention concept in consumer behavior, information related to smells (e.g. verbal smell references) might also be more salient to women than to men. Specifically, consumers are subject to selective-retention, which means that they best remember things that are important to them, due to greater involvement (Bettman 1979). Therefore, based upon these streams of logic the following hypotheses are offered:

**H4a: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's perceived ability to 'almost smell' the food than on a male listener's ability.**



**H4b: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's perceived ability to 'almost taste' the food than on a male listener's ability.**

**H4c: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's affective response toward the ad than on a male listener's response.**

**H4d: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's purchase intent than on a male listener's purchase intent.**

## **Summary**

This chapter summarized the literature on the effects of verbal smell references in radio advertising, the effects of congruent cooking sounds in radio advertising, the interaction of verbal smell references and congruent cooking sounds, and influences on gender. From this, four important themes are identified. First, smell is the strongest sense linked to taste and the strongest sense linked to human emotion. Second, from a verbal perspective, sound effects are the most effective way of eliciting a positive affective response. Third, the concept of imagery allows us to have multiple senses affected simultaneously by individual stimuli. In other words, our senses process stimuli in tandem as opposed to a piecemeal or fragmented processing. And

fourth, females are more attuned with their emotional states due to genetic differences. Dozens of research studies that appear in top-tier journal outlets across several disciplines provide anchoring for these themes as well as a foundation for our hypotheses regarding the influences of verbal smell references and congruent cooking sounds on consumer psychology and behavior.

## **Chapter III**

### **Research Design and Methodology**

#### **Introduction**

Chapter III discusses the research design and methodology of this study. The objectives of this research, research questions and research hypotheses proposed in Chapters I and II are again outlined in this chapter. Pretest I and research design along with pretest II and research design are described. Sampling, data collection, data processing and data analysis, and reliability and validity are also discussed. As will be described the main study contained in this thesis is a 2 x 2 x 2 between-subjects experimental design in which verbal smell reference is manipulated, cooking sounds are manipulated, and gender is measured. The primary statistical techniques used to analyze the main study data are multivariate analysis of variance (MANOVA), analysis of covariance (ANCOVA), and Baron and Kenny's (1986) test of mediation.

#### **Objectives**

This study aims to achieve the following objectives:

1. Explore the link between verbal smell references in radio food advertisements and the consumer's ability to almost smell or taste the food, and its effect on affective responses and purchase intent.

2. Explore the link between verbal taste references in radio food advertisements and the consumer's ability to almost smell or taste the food, and its effect on affective responses and purchase intent.
3. Determine if verbal smell references and congruent cooking sounds in radio food advertisements in a single radio ad will exude greater positive influences on the consumer's ability to almost smell or taste the food, and its effect on affective responses and purchase intent.
4. Determine if verbal smell references in radio food advertisements will exude greater positive influences on a female's ability than a male's to almost smell or taste the food, and its effect on affective responses and purchase intent

## **Research Questions**

This study addresses the following research questions:

1. Do verbal smell references in radio food advertisements affect the consumer's ability to almost smell or taste the food, and what is its effect on affective responses and purchase intent?
2. Do verbal taste references in radio food advertisements affect the consumer's ability to almost smell or taste the food, and what is its effect on affective responses and purchase intent?
3. Do verbal smell references and congruent cooking sounds in radio food advertisements in a single radio ad exude greater positive influences on the consumer's ability to almost

smell or taste the food?, and what are their effects on affective responses and purchase intent?

4. Do verbal smell references in radio food advertisements exude a greater positive influence on a female's ability than a male's to almost smell or taste the food, and what are the differing effects on affective responses and purchase intent?

### **Proposed Hypotheses:**

In response to the preceding research questions, based upon literature synthesized in Chapter II, the following research hypotheses are advanced in this thesis:

H1a: Using a verbal smell reference in a radio food advertisement will positively influence the listener's perceived ability to 'almost smell' the food when listening to the advertisement.

H1b: Using a verbal smell reference in a radio food advertisement will positively influence the listener's perceived ability to 'almost taste' the food when listening to the advertisement.

H1c: Using a verbal smell reference in a radio food advertisement will positively influence the listener's affective response to the advertisement.

H1d: Using a verbal smell reference in a radio food advertisement will positively influence the listener's purchase intent.

H2a: Using congruent cooking sounds in a radio food advertisement will positively influence the listener's perceived ability to 'almost smell' the food when listening to the advertisement.

H2b: Using congruent cooking sounds in a radio food advertisement will positively influence the listener's perceived ability to 'almost taste' the food when listening to the advertisement.

H2c: Using congruent cooking sounds in a radio food advertisement will positively influence the listener's affective response to the advertisement.

H2d: Using congruent cooking sounds in a radio food advertisement will positively influence the listener's purchase intent.

H3a: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener's ability to "almost smell" the food when combined in a single radio advertisement.

H3b: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener's ability to "almost taste" the food when combined in a single radio advertisement.

H3c: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener's affective response to the ad when combined in a single radio advertisement.

H3d: A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener's purchase intent when combined in a single radio advertisement.

H4a: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's perceived ability to 'almost smell' the food than on a male listener's ability.

H4b: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's perceived ability to 'almost taste' the food than on a male listener's ability.

H4c: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's affective response toward the ad than on a male listener's response.

H4d: Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener's purchase intent than on a male listener's purchase intent.

### **Pretest I Procedures**

Pretest I (Appendix A) was initially conducted to aid in the development of the second pretest and the main study through the development of verbal smell references and congruent cooking sounds. Its purpose was to generate smell adjectives through a qualitative research iteration whereby respondents listened to a sound of steak grilling and listed adjectives which described the sound they had heard and to test the adequacy of the sample population. In other words, what describes the sound of steak grilling and do undergraduate students regularly eat at steakhouses (the context of this study)? According to the guidelines of experimental design research brought forth by Perdue and Summers (1986), the sample population must be able to adequately relate to the context of the experiment.

A questionnaire was developed to conduct this pre-test whereby students were asked one open-ended question and four closed-ended questions asking their perceptions of the smell and sound of steak grilling in addition to their frequency of consuming steak and visiting steakhouses. With proper Institutional Review Board (IRB) approval (see Appendix D), one

undergraduate class was selected for Pretest I whereby students were asked to complete the survey in return for extra-credit. Students were also given an alternate assignment to complete if they chose to opt out of the survey.

### **Pretest II Procedures**

Pretest II (Appendix B) was conducted to aid the development of the main study by testing the suitability of the verbal smell references. Its purpose was to test the smell adjectives derived from Pretest I and to retest the adequacy of the sample population. One questionnaire was developed to conduct this study whereby students were asked eight closed-ended questions asking their perception of the sound and smell attributes of steak grilling in addition to their frequency of consuming steak and visiting steakhouses

With proper Institutional Review Board (IRB) approval (see Appendix D), one undergraduate class was selected for Pretest II whereby students were asked to complete the survey in return for extra credit. Students were also given an alternate assignment to complete if they chose to opt out of the survey.

### **Main Study Procedures**

Guided by the results of Pretest I and Pretest II, a main study comprising of 46 questions was administered to approximately two hundred undergraduate students (see Appendix D for IRB approval). Two hundred students will be needed in order to have adequate cell sizes for each of the four manipulated treatment conditions: 1) cooking sounds absent / verbal smell reference



absent; 2) cooking sounds absent / verbal smell reference present; 3) cooking sounds present / verbal smell reference absent; and 4) cooking sounds present / verbal smell reference present. Students will be offered extra credit for the completion of this survey in addition to an alternate extra-credit assignment if they decided to opt out of the survey.

## **Measurement of Variables**

### Being able to “Almost Taste” from a Given Sensory Stimuli

Being able to “almost taste” served as a dependent variable in this experimental design and was measured using a seven-point Likert-type scale anchored with “strongly disagree” (1) and “strongly agree” (7) asking respondents if they could “almost taste” steak grilling after listening to a sound effect representing steak on a grill.

### Being able to “Almost Smell” from a Given Sensory Stimuli

Being able to “almost smell” served as a dependent variable in this experimental design and was measured using a seven-point Likert-type scale anchored with “strongly disagree” (1) and “strongly agree” (7) by asking respondents if they could “almost smell” steak grilling after listening to a sound effect representing steak on a grill.

### Consumer’s Affective Response toward the Advertisement

Affective response also served as a dependent variable in this experimental design. Consistent with a previous study by Madden, Allen, and Twible (1988), consumers’ affective responses to the advertisement was measured with the following items: enjoyable, likeable, persuasive, and

interesting on seven-point Likert-type scales anchored with “strongly disagree” (1) and “strongly agree” (7). The reliability (internal consistency) of these scale items will be reported in Chapter IV of this thesis.

### Purchase Intent

Purchase intent served as the final dependent variable in this experimental design. Consistent with a previous study by Grohmann (2009), purchase intent was measured by asking a respondent how likely and probable they would visit a restaurant in the near future based on the advertisement using seven-point Likert-type scales anchored with “very unlikely” and “very improbable” (1) and “very likely” and “very probable” (9) respectively. The reliability of these scale items will be reported in Chapter IV of this thesis.

### Consumers’ Sex

Sex serves as an independent variable in this research. The sex variable was measured simply by asking all respondents to indicate their sex. As such, sex was included as a dummy variable in our analysis coded as “0” for male and “1” for female.

### Congruent Cooking Sounds

‘Congruent cooking sounds’ served as an independent variable and was manipulated in this experimental design as either being present or absent in the radio advertisement. Consistent with the guideposts established by Perdue and Summers (1986), the realism of the radio ad treatments were rated in by participants in the main study.

### Verbal Smell Reference

Verbal smell reference served as an independent variable and was manipulated in this experimental design as either being present or absent in the radio advertisement. Consistent with the guideposts established by Perdue and Summers (1987), the adequacy of the verbal smell reference was established through the use of pretests I and II.

### Attitude toward the Act

Since according to the theory of planned behavior (Ajzen, 1985) a consumer's attitude toward an act can influence his/her behavior (e.g. purchase intent), we included this construct as a covariate in our study. Attitude towards the act was measured using five items developed by Ajzen (2001) anchored on 7-point semantic differential scales. As designed by Ajzen, the scale contains both affective attitude items (e.g. Unpleasant --- Pleasant) and instrumental attitude measures (e.g. Harmful --- Beneficial). The reliability (internal consistency) of these scale items will be reported in Chapter IV of this thesis.

### Controllability

Since according to the theory of planned behavior (Ajzen, 1985) a consumer's perception of controllability can influence his/her behavior (e.g. purchase intent), we included this construct as a covariate in our study. The three items used to measure behavioral control were developed by Rhodes and Courneya (2003) and were presented to respondents on 7-point Likert-type scales. The reliability (internal consistency) of these scale items will be reported in Chapter IV of this thesis.

### Subjective Norms

Since according to the theory of planned behavior (Ajzen, 1985) a consumer's subjective norms can influence his/her behavior (e.g. purchase intent), we included this construct as a covariate in our study. Although wording was tailored to fit the project at hand, this construct was captured using items suggested by Ajzen (2006). The reliability (internal consistency) of these scale items will be reported in Chapter IV of this thesis.

### Frequency (steakhouse frequency; full-service casual restaurant frequency; steak consumption frequency)

Data were gathered regarding subjects' steakhouse, full-service casual restaurant and steak consumption frequency and these variables were included as covariates in our study. On the survey mechanism, subjects were provided definitions of a full-service restaurant and of a steakhouse. Frequency data were included in order to measure whether the sample population could relate to the study's setting.

### Excitement

In the literature review (Chapter II), contained within the logic leading up to Hypothesis1, this research contended that one of the reasons why verbal smell references can result in positive affective responses is because verbal smell references can trigger excitement surrounding the restaurant. In other words, the logic describes a causal chain in which excitement mediates that relationship between verbal smell references and affective responses. Thus, this research used the excitement component of Aaker's (1997) brand personality scale to operationalize this excitement construct. This excitement construct is composed of eleven descriptive items such as

“daring,” trendy,” and “spirited” (see Appendix C). Respondents are asked to indicate their level of agreement as to whether the words describe the advertised restaurant on 7-point Likert-type scales anchored with “strongly disagree” and “strongly agree.” The reliability (internal consistency) of these scale items will be reported in Chapter IV of this thesis.

### Experimental Realism

According to experimental design guideposts brought forth by Perdue and Summers (1986), a laboratory experiment must demonstrate adequate realism in the eyes of the participating subjects. To assess the realism of this experiment, respondents were asked to respond to the following item on a 7-Point Likert-type scale anchored with “strongly disagree” and “strongly agree”: “This radio ad is realistic.”

### **Analysis**

#### MANOVA:

In this 2 x 2 x 2 between-subjects experimental design, the primary analytical technique employed will be multivariate analysis of variance (MANOVA). In the MANOVA model, the dependent variable will be almost taste, almost smell and affective response. The independent variables will be gender (measured), congruent cooking sounds (manipulated) and verbal smell reference (manipulated). Next, a separate analysis of covariance (ANCOVA) will be calculated to test the predictions related to purchase intent. As previously described, the covariates will include the components of the theory of planned behavior: attitude toward the act, controllability and subjective norm.

The decision to use MANOVA analysis to measure the effects of the verbal smell reference, cooking sounds, and interactions on the almost taste construct, the almost smell construct and affective response construct is consistent with Stevens (2001) who suggests using this technique when presented with multiple dependent variables in addition to exploring interactions between dependent variables and among independent variables. Alternatively, for the testing of multiple dependent variables, several t-tests could be conducted, however, this scenario risks the generation of Type I error.

### ANCOVA

For each of the predictions surrounding the purchase intent dependent variable, ANCOVA was used because Ajzen's (1985; 1991) theory of planned behavior indicates that three other variables influence consumers' purchase intent: subjective norms, attitude toward the act, and controllability. A methodology was needed that could control for these covariates. Consistent with Wildt and Ahtola (1978), ANCOVA was used because the following benefits:

- Increased precision of randomized experiments; provides a statistical control for extraneous variables when direct control through the design of the experiment is impractical or impossible.
- Statistically removes pre-existing differences among groups which are used in experimental tests but which must be assigned intact to various treatment conditions.
- Removes differences on the dependent variable in observational studies among naturally occurring groups which are due to differences in extraneous variables.

- Performs a type of regression analysis which controls for categorical variables when examining the relationship between two or more quantitative variables.

### Baron and Kenny's (1986) Test of Mediation

Lastly, the logic leading up to Hypothesis H1c suggests a verbal smell reference → excitement → affective response causal chain. In other words, excitement is thought to mediate the relationship between the verbal smell reference and affective response. To test the excitement mediation between the verbal smell reference and affective response, this research will employ Baron and Kenny's (1986) procedure. The procedure calls for the calculation of a series of three linear regression models. The first regression model includes only the independent variable (verbal smell reference) and the dependent variable (affective response). In this model, the IV must exert a significant influence on the DV.

In the second regression model, the mediator (excitement) serves as the sole predictor of the DV (affective response). In other words, it must be demonstrated that the initial variable is correlated with the mediator. In the third regression model, both the IV and mediator serve as predictors of the DV (affective response). The mediator variable must show a significant effect on the DV when both the IV and mediator are included in the model. In order to demonstrate mediation, the effect of the IV on the DV must be less in the third regression equation than in the second (Baron and Kenny, 1986). Moreover, perfect mediation exists when the IV has no significant effect on the DV when the mediator is controlled (as in the third regression equation).

## **Chapter IV**

### **Results**

#### **Introduction**

This chapter provides the results of the two pretests and the main study survey from the four sections derived from the two classes surveyed. Regarding the main study (the 2 x 2 x 2 between-subjects experimental design), the MANOVA, ANOVA, and mediation results will each be detailed in this chapter. The MANOVA and ANCOVA results include both those for the main effects and the hypothesized interactions.

#### **Pretest I**

One senior-level Business Ethics course was selected for Pretest I to generate smell adjectives through a qualitative research iteration. Twenty-three non-vegetarian students completed the five question survey (Appendix A). Of the respondents, 47.8 percent (11) were male and 52.2 percent (12) were female, the average age was 22. Table 4.1 shows the responses for the generated smell adjectives. From those results, “smoky,” “juicy” and “delicious” were selected as the most prominent.



Table 4.1 Frequencies of Smell Adjectives

Adjective	Count	Percentage
Juicy	2	9.09%
Beautiful	1	4.55%
Yummy	2	9.09%
Wonderful	1	4.55%
Delicious	4	18.18%
Good	1	4.55%
Spices	1	4.55%
Scrumptious	1	4.55%

Adjective	Count	Percentage
Phenomenal	1	4.55%
Amazing	1	4.55%
Tasty	1	4.55%
Nostalgic	1	4.55%
Gross	1	4.55%
Smoky	2	9.09%
Mouth-Watering	1	4.55%
Appetizing	1	4.55%

Of the respondents, 91.3 percent of them visited steakhouses at least once a year and 100 percent full service restaurants at least once a year. All but two, or 91.3 percent, ate steak at least once a year. Tables 4.2, 4.3 and 4.4 provide a detailed breakdown of these frequencies.

Table 4.2 On average, how many times per year do you typically eat at steak houses?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0	2	8.7	8.7	8.7
One time per year	9	39.1	39.1	47.8
Two times per year	4	17.4	17.4	65.2
Three times per year	2	8.7	8.7	73.9
Four times per year	2	8.7	8.7	82.6
Five times per year	1	4.3	4.3	87.0
Five or more times per year	3	13.0	13.0	100.0
Total	23	100.0	100.0	

Table 4.3 On average, how many times per year do you typically eat at full-service restaurants?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One time per year	6	26.1	26.1	26.1
	Three times per year	5	21.7	21.7	47.8
	Four times per year	3	13.0	13.0	60.9
	Five times per year	5	21.7	21.7	82.6
	Five or more times per year	4	17.4	17.4	100.0
	Total	23	100.0	100.0	

Table 4.4 On average, how many times per year do you typically eat steak?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2	8.7	8.7	8.7
	One time per year	5	21.7	21.7	30.4
	Two times per year	2	8.7	8.7	39.1
	Three times per year	6	26.1	26.1	65.2
	Four times per year	1	4.3	4.3	69.6
	Five times per year	2	8.7	8.7	78.3
	Five or more times per year	5	21.7	21.7	100.0
	Total	23	100.0	100.0	

**Pretest II**

One senior-level Food and Beverage Management course was selected for Pretest III to test the suitability of the verbal smell adjectives. Twenty-eight non-vegetarian students completed the eight question survey (Appendix B). Of the respondents, 32.1 percent (9) were male and 67.9 percent (19) were female, the average age was 22. Table 4.5 shows the results for

the testing of the suitability of the verbal smell adjectives. From the results, “delicious” and “smoky” tested the strongest with a means of 5.25 and 5.11 respectively against a seven-point Likert-type scale anchored with “strongly disagree” (1) and “strongly agree” (7).

Table 4.5 Descriptive Statistics of Verbal Smell Reference Suitability

	N	Minimum	Maximum	Mean	Std. Deviation
The word "delicious" describes the smell of steak grilling:	28	2	7	5.25	1.351
The word "juicy" describes the smell of steak grilling:	28	1	7	4.21	1.572
The word "smoky" describes the smell of steak grilling:	28	2	7	5.11	1.166
Valid N (listwise)	28				

In addition, 75 percent of respondents visit steakhouses at least once a year and 100 percent visit full service restaurants at least once a year. All but three, or 89.3 percent, eat steak at least once a year. Tables 4.6, 4.7, and 4.8 provide a detailed breakdown of these frequencies.

Table 4.6 On average, how many times per year do you typically eat at steak houses?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Zero Times	7	25.0	25.0	25.0
One time per year	10	35.7	35.7	60.7
Two times per year	7	25.0	25.0	85.7
Three times per year	2	7.1	7.1	92.9
Four times per year	2	7.1	7.1	100.0
Total	28	100.0	100.0	

Table 4.7 On average, how many times per year do you typically eat at full-service restaurants?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One time per year	2	7.1	7.1	7.1
	Two times per year	6	21.4	21.4	28.6
	Three times per year	4	14.3	14.3	42.9
	Four times per year	5	17.9	17.9	60.7
	Five times per year	2	7.1	7.1	67.9
	Five or more times per year	9	32.1	32.1	100.0
	Total	28	100.0	100.0	

Table 4.8 On average, how many times per year do you typically eat steak?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Zero Times	3	10.7	10.7	10.7
	One time per year	9	32.1	32.1	42.9
	Two times per year	8	28.6	28.6	71.4
	Three times per year	4	14.3	14.3	85.7
	Four times per year	1	3.6	3.6	89.3
	Five times per year	1	3.6	3.6	92.9
	Five or more times per year	2	7.1	7.1	100.0
	Total	28	100.0	100.0	

**Main Study**

One Introduction to Service Management course, two senior level Business Policy and Strategy courses, and one senior level Hospitality Marketing Management course were selected for the main study. There were 155 non-vegetarian respondents who completed the 46 question survey (Appendix C) which represents a participation rate of approximately 70 percent because

the combined enrollment in these courses is about 230 students. Of the respondents, 41.9 percent (65) were male and 58.1 percent (90) were female, the average age was 22.

In addition, 99.4 percent of respondents visit steakhouses at least once per year, 96.1 percent visit full service restaurants at least once per year, and all but seven, or 95.5 percent eat steak at least once per year. Tables 4.9, 4.10, and 4.11 provide a detailed breakdown of these frequencies. Moreover, overall, the subjects found the radio commercial to which they listened to in the experiment to be of adequate realism (realism = 4.83) (Perdue and Summers, 1986).

Table 4.9 On average, how many times per year do you typically eat at steakhouses?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0 Times	1	.6	.6	.6
1 Time per year	11	7.1	7.1	7.7
2 Times per year	19	12.3	12.3	20.0
3 Times per year	22	14.2	14.2	34.2
4 Times per year	25	16.1	16.1	50.3
5 Times per year	23	14.8	14.8	65.2
More than 5 times per year	54	34.8	34.8	100.0
Total	155	100.0	100.0	

Table 4.10 On average, how many times per year do you typically eat at full service restaurants?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0 Times	6	3.9	3.9	3.9
1 Time per year	19	12.3	12.3	16.1
2 Times per year	36	23.2	23.2	39.4
3 Times per year	33	21.3	21.3	60.6
4 Times per year	19	12.3	12.3	72.9
5 Times per year	13	8.4	8.4	81.3
More than 5 times per year	29	18.7	18.7	100.0
Total	155	100.0	100.0	

Table 4.11 On average, how many times per year do you typically eat steak?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0 Times	7	4.5	4.5	4.5
1 Time per year	6	3.9	3.9	8.4
2 Times per year	11	7.1	7.1	15.5
3 Times per year	12	7.7	7.7	23.2
4 Times per year	13	8.4	8.4	31.6
5 Times per year	19	12.3	12.3	43.9
More than 5 times per year	87	56.1	56.1	100.0
Total	155	100.0	100.0	

These 155 respondents were randomly divided into four separate treatment groups based on which radio ad they would listen to. From this, 153 usable responses were generated. Table 4.12 shows the gender breakdown of each treatment group.

Table 4.12 Treatment Group Descriptive Statistics

Verbal Reference?	Cooking Sound?		N
No	No		42
	Yes		44
	Total	Female	45
		Male	41
Total		86	
Yes	No		34
	Yes		33
	Total	Female	40
		Male	21
Total		61	
Total	No	Female	45
		Male	31
		Total	76
	Yes	Female	43
		Male	34
		Total	77
	Total	Female	88
		Male	65
Total		153	

## Scale Reliabilities

Nunnally and Bernstein (1994) suggest that Cronbach Alphas that exceed 0.7 yield good reliabilities. Table 4.13 details the scale reliabilities for this study. For the variable “Affective Response to Ad,” the Cronbach Alpha was 0.891 and responses were averaged to create a composite “Affective Response” score. The variable “Purchase Intent” had a Cronbach Alpha of 0.961 and responses were averaged to create a composite “Purchase Intent” score. The variable “Controllability” had a Cronbach Alpha of 0.910 and responses were averaged to create a composite “Controllability” score. “Subjective Norm” had a Cronbach Alpha of 0.961 and responses were averaged to create a composite “Subjective Norm” score. The final variable, “excitement” had a Cronbach Alpha of 0.918 and responses were averaged to create a composite “excitement” score.

Table 4.13 Scale Reliabilities

	Reliability Statistics	
	Cronbach's Alpha	N of Items
Affective Response to Ad Scale	0.891	4
Purchase Intent Scale	0.961	2
Attitude towards Act Scale	0.910	5
Controllability Scale	0.881	3
Subjective Norm Scale	0.772	2
Excitement Scale	0.918	11

## Hypothesis Testing

To test the hypotheses (except those with purchase intent as the dependent variable), a multivariate analysis of variance (MANOVA) was calculated, but only after the assumptions of MANOVA found to be met (Hair, Anderson, Tatham, and Black, 1998; Hair, Bush, and Ortinau,



2006. Regarding these assumptions, first, the IVs are categorical variables (present/absent; male/female). Second, the DVs are interval variables (Likert-type scales). Third, Box's  $M = 15.445$  ( $p = .671$ ) which rejects the null hypothesis that the covariances are not homogenous (assumption of homoscedasticity). Fourth, regarding sample size, there are more observations than DVs in every cell. Fifth, there are no outliers in the experimental cells. Sixth, to test the assumption of equivalent experimental cell sizes, three linear regression models were calculated with the same DVs (one DV per regression model) and IVs as the MANOVA model and consistent results were yielded.

Upon meeting the above assumptions, hypotheses were tested with a MANOVA model in which 'almost smell,' 'almost taste,' and affective response served as dependent measures and written smell reference (present or absent), cooking sounds (present or absent), and gender were fixed factors. MANOVA was used because the dependent variables are thought to be related to each other. As can be seen in Table 4.14, a significant effect of the verbal smell reference was found ( $Lambda(3,145) = .826, p = .000$ ). Follow-up univariate ANOVAs (Table 4.15) indicate that a verbal smell reference in an ad significantly enhances an individual's ability to almost smell an advertised food ( $F(1, 145) = 24.88, p = .000$ ; therefore, **Hypothesis 1a, "using a verbal smell reference in a radio food advertisement will positively influence the listener's perceived ability to 'almost smell' the food when listening to the advertisement," is supported**. The estimated marginal mean of the 'almost smell' DV for verbal reference  $_{Absent} = 2.91$  versus  $4.00$  for verbal reference  $_{Present}$ .

Table 4.14 Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Wilks' Lambda	0.079	554.684 <sup>a</sup>	3	143	0
Verbal	Wilks' Lambda	0.826	10.037 <sup>a</sup>	3	143	0
Sound	Wilks' Lambda	0.953	2.334 <sup>a</sup>	3	143	0.076
Gender	Wilks' Lambda	0.982	.891 <sup>a</sup>	3	143	0.447
Verbal * Sound	Wilks' Lambda	0.984	.782 <sup>a</sup>	3	143	0.506
Verbal * Gender	Wilks' Lambda	0.995	.259 <sup>a</sup>	3	143	0.855
Sound * Gender	Wilks' Lambda	0.973	1.303 <sup>a</sup>	3	143	0.276
Verbal * Sound * Gender	Wilks' Lambda	0.998	.088 <sup>a</sup>	3	143	0.966

a. Exact statistic

Table 4.15 Univariate Tests

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
Verbal	You can "almost smell" the steak when listening to the ad?	46.228	1	46.228	24.875	.000
	You can "almost taste" the steak when listening to the ad?	13.387	1	13.387	6.318	.013
	AffectiveResponseMadden	22.752	1	22.752	14.748	.000

In addition, follow-up univariate ANOVAs also reveal that a verbal smell reference in an ad significantly enhances an individual's ability to almost taste an advertised food ( $F(1, 145) = 6.32, p = .013$ ); therefore, **Hypothesis 1b, "using a verbal smell reference in a radio food advertisement will positively influence the listener's perceived ability to 'almost taste' the food when listening to the advertisement," is supported.** The estimated marginal mean of the 'almost taste' DV for verbal reference <sub>Absent</sub> = 3.37 versus 3.96 for verbal reference <sub>Present</sub>.

The ANOVA (Table 4.15) results also indicate that a verbal smell reference in an ad significantly enhances an individual's affective response to an advertisement associated with that smell ( $F(1, 145) = 6.32, p = .013$ ); therefore, **Hypothesis 1c, "using a verbal smell reference in**

**a radio food advertisement will positively influence the listener’s affective response to the advertisement,” is supported.** The estimated marginal mean of the affective response DV for verbal reference  $_{\text{Absent}} = 3.55$  versus  $4.34$  for verbal reference  $_{\text{Present}}$ .

Regarding the predictions surrounding the influence of congruent cooking sounds on individuals’ abilities to almost smell, almost taste, and affective response constructs, as can be seen in Table 4.14, these relationships approach significance ( $\text{Lambda}(3,145) = .953, p = .076$ ), but are not supported by the current data. Thus, **H2a, H2b, and H2c “using congruent cooking sounds in a radio food advertisement will positively influence the listener’s perceived ability to ‘almost smell’ the food when listening to the advertisement** (cooking sound  $_{\text{Present}} = 3.09$  vs. cooking sound  $_{\text{Absent}} = 2.71$ ); **Using congruent cooking sounds in a radio food advertisement will positively influence the listener’s perceived ability to ‘almost taste’ the food when listening to the advertisement** (cooking sound  $_{\text{Present}} = 3.41$  vs. cooking sound  $_{\text{Absent}} = 3.33$ ); **Using congruent cooking sounds in a radio food advertisement will positively influence the listener’s affective response to the advertisement** (cooking sound  $_{\text{Present}} = 3.48$  vs. cooking sound  $_{\text{Absent}} = 3.61$ )” **are not supported**: the data do not support the contention that congruent cooking sounds influence this group of outcome variables.

Hypotheses H3a-c predict interactions between cooking sounds and verbal smell references. Specifically, this research posits that the two will each have a greater effect on the dependent variables (almost smell, almost taste, and affective responses) when combined in a single radio advertisement. Thus, **H3a, H3b, and H3c, “a verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener’s ability to “almost smell” the food when combined in a single radio advertisement; A verbal smell reference and congruent cooking sounds will both exude greater positive influences**

**on the listener’s ability to “almost taste” the food when combined in a single radio advertisement; A verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener’s affective response to the ad when combined in a single radio advertisement,” are not supported** by our data. As will be explained in Chapter V, further data collection in order to increase the relatively small experimental cell sizes may produce significant results.

Due to the potentially intervening influences of the components of the theory of planned behavior (TPB), a separate analysis of covariance (ANCOVA) was calculated for the purchase intent predictions (H1d, H2d, H3d, and H4d). In this model, verbal smell reference, congruent cooking sounds, and gender served as independent variables; purchase intent served as the dependent variable, and controllability, attitude toward the act, and subjective norms served as covariates. As detailed in Table 4.16, when controlling for these three components of TPB, which are known to influence consumers’ purchase intentions, a verbal smell reference does have a significant influence on purchase intent ( $F(1,137) = 15.67, p = .000$ ). Therefore, **H1d, “using a verbal smell reference in a radio food advertisement will positively influence the listener’s purchase intent,” is supported**. The estimated marginal mean of the purchase intent DV for verbal reference <sub>Absent</sub> = 3.53 versus 4.32 for verbal reference <sub>Present</sub>.

Conversely, congruent cooking sounds do not exert a significant influence on purchase intentions: hence, **H2d, “using congruent cooking sounds in a radio food advertisement will positively influence the listener’s purchase intent,” is not supported**. The estimated marginal mean of the purchase intent DV for cooking sounds <sub>Absent</sub> = 3.53 versus 4.32 for cooking sounds <sub>Present</sub>. Further, neither the cooking sound x verbal smell reference interaction, nor the gender x smell reference interaction have a significant influence on purchase intentions. Thus, **H3d and**

**H4d, “a verbal smell reference and congruent cooking sounds will both exude greater positive influences on the listener’s purchase intent when combined in a single radio advertisement; using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener’s purchase intent than on a male listener’s purchase intent,” are not supported.**

Table 4.16 Tests of Between-Subjects Effects

Dependent Variable: ScalePurchaseIntent

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	48.923 <sup>a</sup>	10	4.892	3.044	.002
Intercept	12.678	1	12.678	7.888	.006
ScaleAttAct	19.214	1	19.214	11.954	.001
ScaleControllability	.050	1	.050	.031	.861
ScaleSubjectiveNorm	1.676	1	1.676	1.043	.309
Verbal	25.184	1	25.184	15.669	.000
Sound	.236	1	.236	.147	.702
Gender	.432	1	.432	.269	.605
Verbal * Sound	.015	1	.015	.009	.923
Verbal * Gender	.251	1	.251	.156	.694
Sound * Gender	1.177	1	1.177	.732	.394
Verbal * Sound * Gender	1.030	1	1.030	.641	.425
Error	220.204	137	1.607		
Total	2468.250	148			
Corrected Total	269.127	147			

a. R Squared = .182 (Adjusted R Squared = .122)

Lastly, regarding gender, this research predicts that two stimuli (cooking sounds and verbal smell references) will both exert greater influences on females’ ability to almost taste, almost smell, affective response, and purchase intent than on males. No significant gender

differences were supported by our data. The MANOVA results do not lend support to the almost smell, almost taste, and affective response predictions. Further, the ANOVA results do not support the purchase intent prediction. Thus, **H4a, H4b, and H4c**, “using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener’s perceived ability to ‘almost smell’ the food than on a male listener’s ability; Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener’s perceived ability to ‘almost taste’ the food than on a male listener’s ability; Using a verbal smell reference in a radio food advertisement will have greater positive influence a female listener’s affective response toward the ad than on a male listener’s response,” **are not supported**.

#### **Further testing the theoretical support for H1**

To test the excitement mediation between the verbal smell reference and affective response, this research will employ Baron and Kenny’s (1986) procedure. The procedure calls for the calculation of a series of three linear regression models. Before doing so, however, it was verified that the data did not violate any of the assumptions of linear regression (Hair, Anderson, Tatham, and Black, 1998; Hair, Bush, and Ortinau, 2006). That is: 1) there is a linear relationship between the dependent and independent variables; 2) there is no serial correlation between the error terms (interdependence); 3) the error terms have constant variance (homoscedasticity); and 4) the errors are normally distributed.

In accordance with Baron and Kenny’s (1986) procedure, the first regression model includes only the independent variable (verbal smell reference) and the dependent variable (affective response). In this model, the IV must exert a significant influence on the DV. In the second regression model, the mediator (excitement) serves as the sole predictor of the IV (verbal

smell reference). In other words, it must be demonstrated that the initial variable is correlated with the mediator.

In the third regression model, both the IV and mediator serve as predictors of the DV (affective response). The mediator variable must show a significant effect on the DV when both the IV and mediator are included in the model. In order to demonstrate mediation, the effect of the IV on the DV must be less in the third regression equation than in the second (Baron and Kenny, 1986). Moreover, perfect mediation exists when the IV has no significant effect on the DV when the mediator is controlled (as in the third regression equation).

As can be seen in Table 4.17, in the first regression equation (as described in the previous paragraph) verbal reference does exert a significant influence on affective response [thus, the first of Baron and Kenny's (1986) mediation conditions is met]. In the second regression model (see Table 4.18), excitement shows a significant effect on affective response [hence, the second of Baron and Kenny's (1986) mediation conditions is met]. In the third regression model (see Table 4.19), excitement exerts a significant influence on affective response when controlling for the verbal smell reference and the effect of the smell reference on affective response is less in the third regression equation than in the second (Baron and Kenny, 1986). [Therefore, the third and fourth of Baron and Kenny's (1986) mediation conditions are met]. It is notable that perfect mediation is demonstrated. That is, the smell reference has no significant effect on affective response when the mediator is controlled.

Table 4.17 Verbal Reference Regression Coefficient on Affective Response

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.547	.133		26.748	.000
	Verbal Reference?	.797	.200	.308	3.977	.000

Table 4.18 Excitement Regression Coefficient on Affective Response

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.844	.216		3.914	.000
	ScaleBPExcitement	.827	.055	.783	14.960	.000

Table 4.19 Excitement Regression Coefficient on Affective Response controlling for Verbal Reference

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.856	.217		3.944	.000
	ScaleBPExcitement	.813	.060	.770	13.659	.000
	Verbal Reference?	.092	.148	.035	.623	.535



## **Chapter V**

### **Discussion**

#### **Introduction**

This chapter presents a discussion of conclusions that can be drawn from Pretest I, Pretest II, the Main Study, and hypothesis tests, and mediation test. In addition, theoretical and managerial implications are provided. Lastly, limitations and recommendations for future research are offered.

#### **Conclusions**

Through a qualitative research iteration in Pretest I, three adjectives words were shown to be related to a sound effect of steak grilling: “smoky,” “juicy” and “delicious”. These words were then incorporated into the second Pretest for quantitative confirmation. Pretest I also confirmed that undergraduate students can adequately relate to a steakhouse advertising setting for the experimental design.

In Pretest II, the adjectives “smoky” and “delicious” were confirmed as being the most suitable adjectives for the sound of steak grilling. These words were then incorporated into the mock radio advertisements for the main study. As previously detailed in Chapter IV, results of Pretest II also validate that the sample population frequents full-service restaurants, dines at steakhouses, and consumes steak regularly.

Through the use of MANOVA analysis, our hypothesis that the use of verbal smell references in a radio food advertisement would positively influence the listener's perceived ability to 'almost smell' the food when listening to the ad **was supported**. Through the use of MANOVA analysis, our hypothesis that the use of verbal smell references in a radio food advertisement would positively influence the listener's perceived ability to 'almost taste' the food when listening to the ad **was supported**. Through the use of MANOVA analysis, our hypothesis that the use of verbal smell references in a radio food advertisement would positively influence the listener's affective response to the ad **was supported**. Through the use of ANCOVA analysis, our hypothesis that the use of verbal smell references in a radio food advertisement would positively influence the listener's purchase intent **was supported**.

Our hypothesis that the use of congruent cooking sounds in a radio food advertisement would positively influence the listener's perceived ability to 'almost smell' the food when listening to the ad **was not supported**. Our hypothesis that the use of congruent cooking sounds in a radio food advertisement would positively influence the listener's perceived ability to 'almost taste' the food when listening to the ad **was not supported**. Our hypothesis that the use of congruent cooking sounds in a radio food advertisement would positively influence the listener's affective response to the ad **was not supported**. Our hypothesis that the use of congruent cooking sounds in a radio food advertisement would positively influence the listener's purchase intent.

Our hypothesis that the use of verbal smell references and congruent cooking sounds would both exude greater positive influences on the listener's ability to "almost smell" the food when combined in a single radio ad **was not supported** due to low significance levels. Our hypothesis that the use of verbal smell references and congruent cooking sounds would both

exude greater positive influences on the listener's ability to "almost taste" the food when combined in a single radio ad **was not supported** due to low significance levels. Our hypothesis that the use of verbal smell references and congruent cooking sounds would both exude greater positive influences on the listener's affective response to the ad when combined in a single radio ad **was not supported** due to low significance levels. Our hypothesis that the use of verbal smell references and congruent cooking sounds would both exude greater positive influences on the listener's purchase intent when combined in a single radio ad **was not supported** due to low significance levels.

Our prediction that the use of verbal smell references in a radio food advertisement would have a greater positive influence a female listener's perceived ability to 'almost smell' the food than on a male listener's ability **was not supported** due to insufficient significance levels. Our hypothesis that the use of verbal smell references in a radio food advertisement would have a greater positive influence a female listener's perceived ability to 'almost taste' the food than on a male listener's ability **was not supported** due to insufficient significance levels. Our hypothesis that the use of verbal smell reference in a radio food advertisement would have a greater positive influence a female listener's affective response toward the ad than on a male listener's response **was not supported** due to insufficient significance levels. Our hypothesis that the use of verbal smell references in a radio food advertisement would have a greater positive influence a female listener's purchase intent than on a male listener's purchase intent **was not supported** due to insufficient significance levels.

## **Theoretical Implications**

The motivation of this study was multifaceted. First, one purpose was to explore the link between verbal smell references in radio food advertisements and the consumer's ability to almost smell or taste the food, and its effect on affective responses and purchase intent, to explore the link between verbal taste references in radio food advertisements and the consumer's ability to almost smell or taste the food, and its effect on affective responses and purchase intent.

Another impetus was to determine if verbal smell references and congruent cooking sounds in radio food advertisements in a single radio ad will exude greater positive influences on the consumer's ability to almost smell or taste the food, and its effect on affective responses and purchase intent, and to determine if verbal smell references in radio food advertisements will exude greater positive influences on a female's ability than a male's to almost smell or taste the food, and its effect on affective responses and purchase intent.

By examining the link between verbal smell references and radio advertising, this study makes several contributions to the literature on advertisement design and efficacy, and sensory stimuli's affects on consumers. First, this study furthers Elder and Krishna's (2009) study by incorporating verbal stimuli in the form of radio advertising in place of visual advertising. Likewise, this research fills the gap mentioned by Magnini and Gaskins (2010) which states a need for research linking verbal smell references to a consumer's affective response. In addition, this study furthers the research of Mackenzie and Lutz (1989) which demonstrates that attitude toward an ad ( $A_{AD}$ ) is constituted of the credibility and perception of the ad, the attitude toward the advertiser and advertising, and mood. This thesis validates a portion of their model (see Figure 2.1), by demonstrating a link between verbal stimuli and purchase intent.

As stated in the opening chapters of this thesis, the predictions surrounding a verbal smell reference's influence on outcome variables is a novel contention in the academic literature. The strong significant influence that the verbal smell reference exerted on all four measured consequences in this study (almost taste, almost smell, affective response, and purchase intention) advances the knowledge of our existing body of knowledge. The interconnections between human modalities cannot be denied (Elder and Krishna, 2009; Small and Jones-Gotman, 2000; Small and Prescott, 2005; Rolls, 2005) – the audio description of an olfactory stimulus does produce significant outcomes according to these results. The fact that smell is the strongest human modality (Schifferstein and Tanudjaja, 2004) probably likely, in part, drove these reactions of potential consumers listening to the experimental advertisements.

In this research project's quest to delve deeper into the linkage between verbal smell references and affective responses, the finding that excitement exerts a perfect mediation in this linkage contributes to existing academic knowledge. In other words, the smell reference → excitement → affective response causal chain has never been examined in extant literature. According to the literature search contained herein, brand personality literature has rarely, if ever, been cross-pollinated with sensory advertising research. The mediation uncovered in this research aids our understanding of the influence of verbal smell references on affective responses and hopefully opens the door for further fusion of these disparate streams of literature.

Furthermore, empirical research presented herein not only validates, but furthers Aaker's (1986) study. By limiting the exposure to visual stimuli through the use of audio stimuli, this study shows that advertisements with sensory stimuli can still be effective with consumers without complete sensory exposure. It is often thought that if an individual possesses a physical handicap limiting one of his/her senses, then his/her alternate senses strengthen as a natural

means of compensation. While this research did not test audio in conjunction with visual, the verbal smell reference certainly appears to be a useful advertising tactic in an audio-only format. Magnini and Gaskins (2010) and Magnini and Karande (2010) tested the written smell references in print ads and found that that exert positive outcomes on consumer affect and behavior, this research now advances this body of inquiry to include smell references in an audio format.

### **Managerial Implications**

Research with the intended focus of exploring how restaurant advertising can be more effective is significant on both theoretical and managerial levels due to the high failure rates of restaurants in addition to the ever increasing levels of advertising expenditures. Studies have been conducted showing the relationship between human senses and emotion (Schifferstein and Tanudjaja, 2004) which lead to positive affective responses (Peck and Wiggins, 2006). Since radio advertising is a strong medium for evoking sensory responses (Russell and Lane, 1990), there is great potential in exploring the linkages between this medium and the human psyche. However, there is a deficiency of research in this field, a vacancy in which this study strives to fill and provide opportunities for continued research.

The results of this study also have implications for managerial decisions, especially those based upon marketing strategy. Practice is usually wiser than theory: Restaurateurs have long been aware of the strong influence of smells of consumer psychology within a restaurant's physical environment. For decades, it has been common practice in the industry to vent appetizing smells from the kitchen to the front-of-house and to offer ample circulation for the expulsion of negative smells from the physical environment (e.g. smells associated with used

fryer oil and the dishwashing areas). The findings of this investigation, however, reveal that verbal smell references are linked to the consumer's ability to almost smell and almost taste the sound of food being cooked. Hence, managers must keep the interconnections between diner's modalities at the top of their minds.

In addition, the results suggest that verbal smell references positively influence the listener's affective response to the ad in addition to positively influence their purchase intent. Therefore, managers and advertisers within the restaurant industry may consider incorporating verbal smell references into their advertisements. From an anecdotal perspective, doing so does not currently appear to be a common practice, but is associated with potential value. Often the first mover on an advertising strategic initiative has greater results than the laggard. That is, perhaps if eventually most restaurant ads begin to incorporate smell references the margin of their utility might shrink; thus, managers are encouraged to consider the results and conclusions brought forth here.

The verbal smell reference → excitement → affective response causal chain suggests a couple of things to managers. First, conceptualizing these linkages enhances the understanding of how the influence of a verbal smell reference works. Stated differently, managers who understand a 'process' should have an advantage over managers who cannot conceptualize the same process – particularly one that relates to consumers' reactions to advertising stimuli. Second, the final portion of the causal chain tells managers that perceptions of brand excitement are an antecedent to positive affect. Managers should, therefore, investigate additional means to communicate a sense of brand excitement through their marketing communications.

From this study, the significance levels were not adequate to support three of the hypotheses. Using this as a point of reference, it does not appear to be worthwhile for restaurant

marketers to incorporate congruent cooking sounds within their advertisements or try to incorporate those sounds in parallel with verbal smell references. In addition, managers and advertisers within the restaurant industry are not advised to try and target specific genders with audio sensory stimuli.

### **Limitations and Suggestions for Future Research**

The findings of this study must be tempered with certain limitations. First, as within any experimental design, extending results beyond the context, instruments, and sample used in the experiment must be done cautiously. For example, regarding this study, a judgment sample of undergraduate students was used and many not accurately represent an entire population of restaurant consumers, particularly given the low mean age of this undergraduate population. Using different sampling frames, future studies could replicate this experiment across a variety of groups or clusters for more accurate data regarding specific niches to explore their reactions to sensory stimuli.

In addition to the judgment sample of undergraduate students, the response rate was lower than expected. However, the interactions are approaching significance. Future studies could replicate this experiment with a larger sample size. Such an effort could test aid the testing of the interactions that were hypothesized in this research. Hypothesis testing involving interactive effects involving desegregating the sample to even smaller cell sizes.

Also with regard to generalizability, the second limitation realized was the focus on steakhouses as a sole context of the hypothesis testing. Again, an opportunity with almost limitless potential, the sound of steak grilling was used for our study as our target location was



steakhouses. As there are many sounds associated with cooking and preparing food in addition to an increasing amount of restaurant genres and sub-themes within each genre, future studies could use a variety of different sounds and restaurant styles to locate any specific trends or if certain sounds are more attractive in advertising.

The third limitation realized was the sole use of a female voice on the radio advertisement. Future studies could explore how the use of male and female voices in advertising potentially influences purchase intent and affective reactions of both genders. For example, is a female voice more appealing to males than male voices? Moreover, perhaps the relative masculinity or femininity of the advertised products plays a role in these relationships: for instance, are female voices more appealing in cosmetics commercials and males more appealing in Viagra commercials? Being that more money is likely wasted on advertising than nearly any other business activity (Ries and Trout, 1993), research that sheds more light on these issues is ripe for investigation.

The fourth limitation realized was the use of only radio advertising. The use of radio advertising completely removes the visual aspect. Future research could expand into television, print and internet advertising. It is quite possible that all forms of advertising mediums can draw upon multiple senses (Lindstrom, 2005). In addition, the most innovative firms are increasingly communicating with potential customers through social media platforms. Thus, research could also be conducted on how to best draw upon the senses through these emerging marketing communication elements.

The final limitation that was realized was the lack of proper audio equipment for testing and computer software for advertisement design. The incorporation of a professionally designed radio advertisement played over high quality sound equipment could yield different results. That

is, the treatment conditions in this experimental design were conducted in multiple classrooms; in some rooms that ads appeared to sound crisper than in other classrooms. Along these lines, future studies could be conducted on how the sound quality of an advertisement affects purchase intent. For instance, if an advertised message is of poor sound quality when it reaches the consumer, does the consumer think less of the advertised product or brand; or does the consumer attribute the poor sound quality to other sources such as the radio station, the reception in the geographic area, or the stereo equipment through which it is being transmitted? Attribution theory, which encompasses individual attempts to comprehend the causes and implications of events (Ajzen and Fishbein, 1983; Fincham, 1983; Monson, 1983; Ross and Anderson, 1982), is ripe for application in this context.

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## Appendix A: Pretest I Survey

## Dear Students,

Please know that your completion of this survey is completely voluntary; instead of completing this survey you can opt to participate in an alternate extra-credit activity for an equivalent amount of credit.

**If you do choose to complete a survey, we ask that you read the items carefully and respond with according care.**

Please write one adjective that best describes the smell of a steak grilling:

---

### **Frequency:**

On average, how many times per year do you typically eat at steak houses?

- Zero times → Are you a vegetarian? yes \_\_\_\_\_; no \_\_\_\_\_
- 1 time per year
- 2 times per year
- 3 times per year
- 4 times per year
- 5 times per year
- More than 5 times per year

On average, how many times per year do you typically eat at full-service restaurants?

- Zero times
- 1 time per year
- 2 times per year
- 3 times per year
- 4 times per year
- 5 times per year
- More than 5 times per year

On average, how many times per year do you typically eat steak?

- Zero times
- 1 time per year
- 2 times per year
- 3 times per year
- 4 times per year
- 5 times per year
- More than times per year

**Demographic Information:**

In what year were you born? \_\_\_\_\_

You are a:    Female \_\_\_\_    Male \_\_\_\_

**THANK YOU!**

## Appendix B: Pretest II Survey



On average, how many times per year do you typically eat steak?

- Zero times
- 1 time per year
- 2 times per year
- 3 times per year
- 4 times per year
- 5 times per year
- More than times per year

**Demographic Information:**

In what year were you born? \_\_\_\_\_

You are a:    Female \_\_\_\_\_    Male \_\_\_\_\_

**THANK YOU!**



## Appendix C: Main Study Survey





This ad is interesting.

Strongly  
Disagree

Neither

Strongly  
Agree

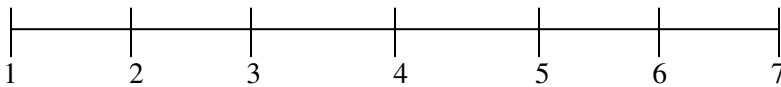


The ad clearly communicates its message.

Strongly  
Disagree

Neither

Strongly  
Agree

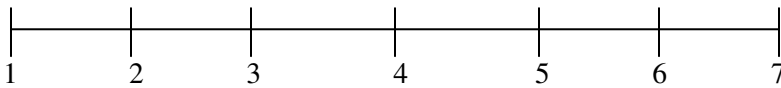


The ad's message is easy to comprehend.

Strongly  
Disagree

Neither

Strongly  
Agree

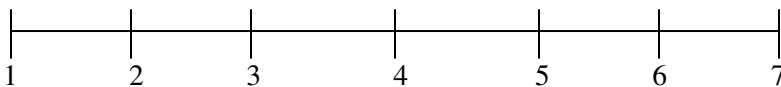


The ad is believable.

Strongly  
Disagree

Neither

Strongly  
Agree

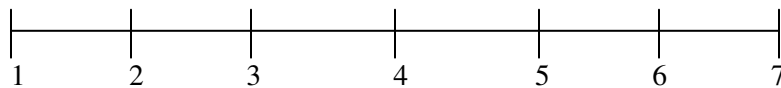


Please circle "7" on this item so that we may screen our results for accuracy.

Strongly  
Disagree

Neither

Strongly  
Agree

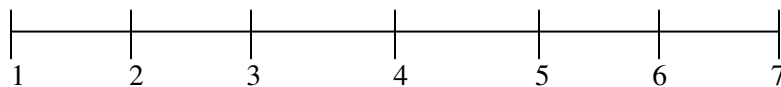


If you visited this restaurant, you would probably order a steak.

Strongly  
Disagree

Neither

Strongly  
Agree















**Demographic Information:**

In what year were you born? \_\_\_\_\_

You are a:      Female \_\_\_\_\_  
                         Male \_\_\_\_\_

**THANK YOU!**

## Appendix D: IRB Approval Letter

## **MEMORANDUM**

**DATE:** March 29, 2010

**TO:** Vincent Magnini, Eric Davis, Nancy G. McGehee, Pamela A. Weaver

**FROM:** Virginia Tech Institutional Review Board (FWA00000572, expires June 13, 2011)

**PROTOCOL TITLE:** Eric Davis Master's Thesis

**IRB NUMBER:** 10-263

As of March 29, 2010, the Virginia Tech IRB Administrator, Carmen T. Green, approved the new protocol for the above-mentioned research protocol. This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents. Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others. All investigators (listed above) are required to comply with the researcher requirements outlined at <http://www.irb.vt.edu/pages/responsibilities.htm> (please review before the commencement of your research).

### **PROTOCOL INFORMATION:**

Approved as: **Exempt, under 45 CFR 46.101(b) category(ies) 2**

Protocol Approval Date: **3/29/2010**

Protocol Expiration Date: **NA**

Continuing Review Due Date\*: **NA**

\*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

### **FEDERALLY FUNDED RESEARCH REQUIREMENTS:**

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals / work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee. The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

### **Office of Research Compliance**

Institutional Review Board

2000 Kraft Drive, Suite 2000 (0497)

Blacksburg, Virginia 24060

540/231-4606 Fax 540/231-0959

e-mail [irb@vt.edu](mailto:irb@vt.edu)

Website: [www.irb.vt.edu](http://www.irb.vt.edu)

## Appendix E: Radio Ad Scripts

### **Script with Verbal Reference and with cooking sound**

*(Ambient Restaurant Noise and Swing Music)*

The thickest cut of prime beef

You can almost smell the smoky and delicious aroma of your steak grilling to perfection

And served sizzling (*Sizzle Sound Effect*) so the last bite stays as hot and delicious as the first

Omega Steakhouse, life's too short to eat anywhere else

### **Script with Verbal Reference and without cooking sound**

*(Ambient Restaurant Noise and Swing Music)*

The thickest cut of prime beef

You can almost smell the smoky and delicious aroma of your steak grilling to perfection

And served sizzling so the last bite stays as hot and delicious as the first

Omega Steakhouse, life's too short to eat anywhere else

### **Script without Verbal Reference and with cooking sound:**

*(Ambient Restaurant Noise and Swing Music)*

The most delicious cut of prime beef

Smoke grilled to give you that perfect flavor

And served sizzling (*Sizzle Sound Effect*) so the last bite stays as hot and delicious as the first

Omega Steakhouse, life's too short to eat anywhere else

**Script without Verbal Reference and without cooking sound:**

*(Ambient Restaurant Noise and Swing Music)*

The most delicious cut of prime beef

Smoke grilled to give you that perfect flavor

And served sizzling so the last bite stays as hot and delicious as the first

Omega Steakhouse, life's too short to eat anywhere else