

8-2017

The Effects of Calorie Information Disclosures on Food Choice and Retailer-Related Outcomes

Christopher Berry

University of Arkansas, Fayetteville

Follow this and additional works at: <http://scholarworks.uark.edu/etd>

 Part of the [Human and Clinical Nutrition Commons](#), [Marketing Commons](#), and the [Sales and Merchandising Commons](#)

Recommended Citation

Berry, Christopher, "The Effects of Calorie Information Disclosures on Food Choice and Retailer-Related Outcomes" (2017). *Theses and Dissertations*. 2041.

<http://scholarworks.uark.edu/etd/2041>

This Dissertation is brought to you for free and open access by ScholarWorks@UARK. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of ScholarWorks@UARK. For more information, please contact scholar@uark.edu, ccmiddle@uark.edu.

The Effects of Calorie Information Disclosures on Food Choice and Retailer-Related Outcomes

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Business Administration with a Concentration in Marketing

by

Christopher Berry
University of Tennessee at Chattanooga
Bachelor of Science in Health and Human Performance, 2010
University of Tennessee at Chattanooga
Master of Business Administration, 2012

August 2017
University of Arkansas

This dissertation is approved for recommendation to the Graduate Council.

Dr. Scot Burton
Dissertation Director

Dr. Elizabeth Howlett
Committee Member

Dr. Ronn J. Smith
Committee Member

Dr. Christopher L. Newman
Ex-Officio Member

ABSTRACT

Federal legislation will begin requiring the provision of calorie information on the menus and menu boards of restaurants and other retail food establishments with 20 or more locations in May 2018. Food retailers not included in this mandate can choose to voluntarily provide calorie information to consumers. However, there are concerns that this major policy change will not have the desired widespread positive effects on consumer choice behavior. Further, although proponents of calorie labeling argue that consumers have the right to know the calorie content of their food orders, many food retailers have argued that calorie labeling is too expensive to implement and feared the loss of business from their calorie information becoming public knowledge. To address these important concerns, this dissertation offers a conceptualization to examine consumers' divergent responses to the provision of calorie information on restaurant menus, while providing a more complete understanding of the consequences of calorie labeling on retailer-related responses.

Essay 1 offers a conceptualization regarding consumers' food-value orientations and develops valid multi-item measures of these constructs. These measures are used to understand the drivers of consumers' food consumption decisions and demonstrate how these new food-value orientations moderate responses to objective nutrition information provision. Eight studies, including two field studies, are conducted to establish the reliability and validity of the three orientation measures—health-value orientation, taste-value orientation, and quantity-value orientation—and examine the direct and moderating effects of these food-value orientations on meal choice. Findings from the three application experiments show that food-value orientations

are associated with asymmetric responses to calorie labeling on restaurant menus and menu boards.

Essay 2 focuses on the retailing implications of this major policy change. Specifically, this research examines the effects of menu calorie labeling on consumers' retailer-related responses. A conceptual framework is developed drawing from the attribution theory and consumer information processing literatures. Findings across five studies, including two restaurant field studies, show that menu calorie labeling has a positive impact on retailer-related outcomes. However, these effects are attenuated when the restaurant is perceived to be more (versus less) healthful and when menu calorie labeling is mandatory (versus voluntary).

ACKNOWLEDGEMENTS

Many individuals played critical roles in supporting me through the completion of this dissertation and my doctoral program. I would like to begin on a personal note by acknowledging the love and support that my family provided throughout my time at the University of Arkansas. My wife, Tara, was the foundation of my support system throughout the program. She has supported me from the day I first mentioned pursuing a Ph.D. through the job market, never stressing about where we would end up, till now as I wrap up my dissertation. Even after our daughter's sleepless nights, she was completely selfless in taking great care of our family and always made it look so easy. I would like to acknowledge my beautiful daughter, Lillian, who was born in Fayetteville. She is such a joy. I have never been around someone that is so contagiously happy. Every day, I look forward to coming through our door to hear "Daddy" as Lillian and our four-legged daughter, Ellie, race to me. Lillian puts life in perspective for me. I look at her and instantly realize that the small things in life really do not matter. Finally, I would like to thank my parents, Shawn and Elaine Clifton and Michael Berry, and my late grandmother, Wanda Tipton, for their encouragement during the program.

I decided to complete my doctoral degree at the University of Arkansas primarily because I wanted to work with two faculty members, Scot Burton and Betsy Howlett, who research important consumer health and well-being issues. I am so thankful that I have been able to work with them on this dissertation and on numerous other projects over the course of the last four years. I am eternally grateful to Scot Burton, my dissertation chair, for all the time he has devoted to me and the training and guidance he has provided me with. His dedication to research and endurance are unmatched, but I hope to model my career after him. It is truly an honor to

have him as a mentor. I am also very appreciative of Betsy Howlett, a key member of my dissertation committee. Her creativity and research ideas are inspiring. I admire how she continuously identifies and develops important research questions to improve the well-being of consumers or inform public policy decisions. I am very much looking forward to continuing my work with Scot and Betsy.

I would also like to acknowledge two more members of my dissertation committee, Ronn Smith and Christopher Newman, for their contributions to my academic career thus far. It was a privilege to have had the opportunity to take two seminars from Ronn Smith. I am grateful for his feedback on research during these seminars as well as general advice and support throughout the program. I am very thankful to have had Christopher Newman on my dissertation committee. Having received his Ph.D. from the University of Arkansas, his advice provides me with a unique perspective. Not to mention, his productivity since obtaining his Ph.D. has set the bar high for doctoral students in the Marketing Department. I am also looking forward to continuing to work with Christopher in the future.

With many individuals who have been extremely helpful and supportive in a myriad of different ways, I would also like to thank the Marketing Department at the University of Arkansas. The department provides excellent support for doctoral students in every stage and facet of the program. As a department chair, Jeff Murray ensures that doctoral students are well-supported. Pam Heinzl and Sandra Birchfield go above and beyond taking care of travel and other administrative issues. Dub Ashton, Tom Jensen, and Molly Rapert have always had open doors and have been more than happy to provide me with advice. Dub has given me a great deal of teaching-related advice, but always first asks about my family which I appreciate. I also appreciate Steve Kopp participating on my comprehensive exam committee. Bob Stassen has

always given me a good laugh, and it is always a pleasure to speak with my neighbors across the hall—John Cole and Nicole Cox—who have also provided me with their fair share of teaching-related tips and ideas. I would also like to thank my Ph.D. program colleagues, especially Amaradri Mukherjee and Alireza Golmohammadi, for contributing to a great experience in the program.

Finally, I would like to acknowledge two individuals in the field that have had a major impact on these early stages of my academic career. The first is Katie Kelting who is an Assistant Professor at Saint Louis University, and the second is Keith Richards who is an Associate Professor at Baylor University. I have had the pleasure to work with Katie and get to know her and her family over the past few years. At my first conference, Katie went out of her way to make sure that I was introduced to people and felt welcome. Since then, Katie and her husband, Bobby, have always been incredibly helpful and kind to our family. At the University of Tennessee at Chattanooga, Keith was an undergraduate professor of mine, and he was my mentor during the MBA program. During our time in Chattanooga, I got to know him and his family personally and now consider him to be a good friend. Without him, I never would have decided to pursue a Ph.D. in the first place. Keith opened my eyes to an academic career and supported me through the entire process of applying to programs and deciding where to go.

DEDICATION

This dissertation is dedicated to my beautiful family, Tara, Lillian, and Ellie, who motivate and inspire me daily to be the best I can be in every facet of my life. Not to mention, they make every day truly special. I am incredibly grateful for their love and support.

TABLE OF CONTENTS

I.	Introduction.....	1
	Motivation for the Dissertation.....	2
	Objectives of the Dissertation.....	5
	Overview of Theoretical Contributions	7
	Overview of Substantive Contributions.....	9
	Structure of the Dissertation	10
	References.....	12
II.	Essay 1.....	19
	Abstract.....	20
	Introduction.....	21
	Consumers' Food-Value Orientations	25
	Direct and Moderating Effects of Food-Value Orientations on Meal Choice	27
	Study 1	33
	Study 2	38
	Study 3	41
	Study 4	44
	Study 5	51
	Study 6	56
	Study 7	62
	General Discussion	66
	References.....	74

Tables	81
Figures.....	88
Appendices.....	93
III. Essay 2.....	99
Abstract	100
Introduction.....	101
Voluntary Versus Mandatory Menu Calorie Labeling	104
Moderating Role of a Restaurant’s Perceived Healthfulness	107
Study 1	110
Study 2	114
Study 3	119
Study 4	121
Study 5	125
General Discussion	129
References.....	138
Tables	145
Figures.....	148
Appendices.....	155
IV. Conclusion	158
Recapitulation of Findings and Contributions	159
Directions for Future Research	161
Conclusion	164
References.....	165

V.	General Appendix	168
	IRB Approval Letters.....	169

LIST OF TABLES

Tables for Essay 1	81
Table 1.1	81
Table 1.2	83
Table 1.3	84
Table 1.4	85
Table 1.5	86
Table 1.6	87
Tables for Essay 2	145
Table 2.1	145
Table 2.2	146
Table 2.3	147

LIST OF FIGURES

Figures for Essay 1.....	88
Figure 1.1	88
Figure 1.2	89
Figure 1.3	90
Figure 1.4	91
Figure 1.5	92
Figures for Essay 2.....	148
Figure 2.1	148
Figure 2.2	149
Figure 2.3	150
Figure 2.4	151
Figure 2.5	152
Figure 2.6	153
Figure 2.7	154

INTRODUCTION

Motivation for the Dissertation

Overeating, unhealthy food choices, and numerous marketing practices are significant contributors to the obesity epidemic, a major public health challenge that has attracted the attention of many consumer researchers (Bublitz, Peracchio, and Block 2010; Seiders and Petty 2004). Recent findings show that over two-thirds of adults in the United States are currently either overweight or obese (CDC 2017; ERS 2017). Obesity is a major concern for consumer health and welfare because it contributes to mortality (Berrington de Gonzalez et al. 2010; Flegal et al. 2005), has major healthcare cost implications (Finkelstein et al. 2009), and negative psychological and sociological effects (Bublitz, Peracchio, and Block 2010; Christakis and Fowler 2007; Falkner et al. 2001; Puhl and Heuer 2010). For example, obesity is estimated to increase mortality rates by approximately 44% among consumers who have not smoked and are otherwise healthy (Berrington de Gonzalez et al. 2010) and accounts for approximately \$150 billion in annual healthcare costs (Finkelstein et al. 2009). To attempt to counter the prevalence of obesity and improve consumer health and welfare, there has been and continues to be substantial interest in the communication of nutrition information to consumers in the marketplace using a myriad of objective nutrition information disclosures.

Objective nutrition information disclosures are a ubiquitous part of consumers' experience in grocery retailers and supermarkets today (Andrews 2011). While shopping in a typical grocery store, consumers are exposed to back-of-package Nutrition Facts panels (NFP) and numerous front-of-package nutrition information disclosures that have been developed by food retailers, food manufacturers, and nongovernmental organizations. Front-of-package labeling includes various types of information and a plethora of presentation formats, both of

which differ across product categories, brands, and retailers; examples of front-of-package disclosures include Traffic Light-Guideline-Daily Amounts icons, heart healthy symbols, “Facts Up Front” and “Healthy Stars” labeling (Andrews, Burton, and Kees 2011; Newman, Howlett, and Burton 2014; 2016). Although there many formats of nutrition information disclosures provided on the packages of packaged food products, only one of these disclosures—the NFP—is currently mandated in the United States.

The Nutrition Labeling and Education Act of 1990 (NLEA) (Public Law 101-535) authorized the Food and Drug Administration (FDA) to design a mandatory nutrition label for packaged food items. This Nutrition Facts panel, mandated on most food packages since 1994, was designed to convey product-specific information on serving sizes, calories, and nutrients (e.g., total fat, saturated fat, cholesterol, and sodium). By increasing the accessibility of nutrition information at the point of sale, Nutrition Facts panels were expected to enable consumers to make more healthful consumption decisions in the context of their daily diet (FDA 2010; Kozup, Creyer, and Burton 2003; Moorman 1996). Nutrition Facts panels have been shown to have beneficial outcomes on consumers’ intentions, attitudes, and beliefs, especially among consumers who have greater motivation to process nutrition information (Balasubramanian and Cole 2002; Burton, Garretson, and Velliquette 1999; Ford et al. 1996; Garretson and Burton 2000; Howlett, Burton, and Kozup 2008; Keller et al. 1997; Kozup, Creyer, and Howlett 2003). However, the NLEA does not cover all food products. Notable exclusions include food consumed for immediate consumption, such as food from restaurants, grocery store delicatessens, and vending machines.

Thus, although NFPs on packaged food products have been required for nearly 25 years, retailers who offer food prepared for immediate consumption were exempt from such

requirements (FDA 1993). The omission of foods prepared for immediate consumption from this legislation is a critical concern for several reasons. Away-from-home foods account for approximately half of total food sales in the United States each year (ERS 2017), and about one-third of Americans' total calories are consumed from these foods (Lin, Guthrie, and Frazão 1999). In addition, away-from-home foods are often higher in calories and lower in overall nutrition quality (Guthrie, Lin, and Frazão 2002; Nestle 2003; Roberto, Schwartz, and Brownell 2009; Todd, Mancino, and Lin 2010), and consumers drastically underestimate the calorie, fat, and sodium content of these meals; this underestimation is especially true for less healthful meal options (Burton and Creyer 2004; Burton et al. 2006; Burton, Howlett, and Tangari 2009; Wansink and Chandon 2006). The proportion of food sales accounted for by away-from-home foods, combined with the number of calories consumed from these meals (Variyam 2005), has made restaurants and other retail food establishments not covered by the NLEA an obvious target for the provision of nutrition information aimed at decreasing the prevalence of obesity in the United States (Downs et al. 2013).

As a strategy to help consumers make more healthful away-from-home food choices and, thus, counter rising obesity rates, chain restaurants and other retail food establishments with 20 or more locations will soon be required by federal legislation to provide calorie information on their menus and menu boards (Public Law 111-148). Although this legislation was initially passed as part of the Patient Protection and Affordable Care Act of 2010, the compliance date has been extended multiple times; restaurants and retail food establishments covered by this mandate will begin being required to disclose this information on May 7, 2018 (FDA 2014; 2016; 2017). The legislation also specifies that retail food establishments not included in this mandate have the option to voluntarily provide calorie information to consumers by registering

with the FDA (FDA 2014). However, this legislation was passed despite concerns, based primarily on the results of large-scale field studies, that this major market-based change to the information environment will not have the desired widespread beneficial effects on consumer choice behavior (Burton and Kees 2012; Elbel et al. 2009; Elbel, Gyamfi, and Kersh 2011; Ellison, Lusk, and Davis 2014; Finkelstein et al. 2011; Harnack and French 2008; Harnack et al. 2008; Long et al. 2015; Loewenstein 2011; Tandon et al. 2011; Swartz, Braxton, and Viera 2011). That is, although some online and laboratory-based studies appear to support the effectiveness of menu calorie labeling (Burton, Howlett, and Tangari 2009; Howlett et al. 2009; Parker and Lehmann 2014; Roberto et al. 2010; Wansink and Chandon 2006; Wisdom et al. 2010), there is an increasing amount of evidence from large-scale field studies that suggests that such tactics will be ineffective in changing consumers' crystallized food consumption behaviors. Further, while proponents of calorie labeling argue that consumers have the right to know the calorie content of their food orders to make more informed, healthful choices (Bassett et al. 2008; Burton et al. 2006; Pomeranz and Brownell 2008; Wansink and Chandon 2006), many food retailers have contended that calorie labeling is too expensive to implement and feared the loss of business if calorie information for their menu items became widespread public knowledge (Goldman 2015; Roberto, Schwartz, and Brownell 2009; Rudd Center for Food Policy and Obesity 2008; VanEpps et al. 2016).

Objectives of the Dissertation

To address these critical concerns stemming from this major marketplace change to the retail information environment, this dissertation offers a conceptualization to examine

consumers' meals choices and divergent responses to the provision of calorie information on restaurant menus and menu boards, while providing a more complete understanding of the implications of calorie labeling for restaurants and other retail food establishments. Thus, using a total of 13 studies across two separate essays, this dissertation will address six focal research objectives.

1. Provide a conceptualization of alternative domains of food-oriented value and develop measures to assess consumers' food-value orientations;
2. Demonstrate the reliability, item convergence, and discriminant, nomological, predictive validity, and expected group difference validity for the food-value orientation measures;
3. Empirically demonstrate how these food-value orientation measures influence consumer choice outcomes and are associated with differing consumer responses to the provision of calorie information on restaurant menus;
4. Examine the direct effect of menu calorie labeling on consumers' perceptions of restaurants' concern for customer well-being and the indirect effect of menu calorie labeling on patronage intentions, attitudes toward restaurants, and restaurant attribute expectations;
5. Demonstrate how these positive direct and indirect effects of menu calorie labeling are attenuated when menu calorie labeling is mandatory (versus voluntary);
6. Show the direct and moderating effects of a restaurant's perceived healthfulness on consumers' responses to restaurants.

Overview of Theoretical Contributions

In addressing the primary research objectives provided above, both essays offer theoretical and conceptual contributions. Essay 1 offers a new conceptual framework to better understand consumers' food consumption decisions and responses to the provision of objective nutrition information. This essay provides conceptualizations and multi-item measures of three food-value orientations—taste-value orientation, quantity-value orientation, and health-value orientation—that are found to have direct and moderating influences on consumers' food consumption decisions. In a series of three application studies, consumers' enduring food-value orientations are found to interact with the provision of objective nutrition information to impact consumers' food choices, operationalized in this research as meal calories ordered. This results in asymmetric effects of information provision, resulting in both intended (favorable) and unintended (unfavorable) consequences (Stewart and Martin 1994; 2004). Specifically, health-value oriented consumers tend to order fewer calories and, thus, use the provision of calorie information to order lower calorie meals, while other value orientations and their interactions with calorie information provision result in consumers ordering more calories. In summary, the conceptual framework developed demonstrates the counterbalancing effects of calorie information provision on calories ordered based on consumers' food-value orientations and provides a theoretical explanation for the plethora of nonsignificant results regarding the marketplace effects of menu calorie labeling on calories ordered (see Long et al. 2015). This novel conceptualization also offers a framework for future research to examine other forms of communication and promotion.

The second essay extends attribution theory principles to a novel retailing context, contributes to a small body of literature that has examined the effects of nutrition information provision on firm- and retailer-related outcomes, builds on the health halo literature, and addresses a call for research examining the impact of calorie information provision on store patronage (Burton, Howlett, and Tangari 2009; Grewal and Levy 2007). Essay 2 findings extend the growing body of attribution theory literature (Kelley 1967) in a retail context (e.g., Cheema and Patrick 2008; Ellen, Mohr, and Webb 2000; Forehand and Grier 2003; Puccinelli et al. 2009) by demonstrating the effects of voluntary versus mandatory information provision on retailer-related outcomes. Because consumers are more and more concerned about their health and well-being (IFIC 2012; Nielsen 2015; Rudd Center for Food Policy and Obesity 2008; Trivedi 2011), providing calorie information is found to have a favorable influence on consumers' responses to food retailers. However, extending the discounting principle of attribution theory (Folkes 1988; Kelley 1973), the results of these favorable attributions are attenuated when consumers are aware that the food retailer is simply complying with a mandatory government regulation. Furthermore, these studies examine the direct and moderating role of a restaurant's perceived healthfulness (Chandon and Wansink 2007) on retailer-related outcomes; these findings contribute to the health halo literature by showing that consumers may overgeneralize from the perceived health positioning of a restaurant to broader evaluations of retailers (e.g., Andrews, Netemeyer, and Burton 1998).

Overview of Substantive Contributions

With clear implications for consumer well-being, public policy, and food retailers, the essays in this dissertation provide many substantive contributions. For example, findings from Essay 1 show that consumers' food-value orientations influence the number of calories consumers order, which has direct implications for consumer health and well-being. Therefore, consumers guided by their food-value orientations, may respond to calorie information by either ordering more or fewer calories. With calorie information becoming required on restaurants' menus and menu boards soon, these findings clearly indicate the importance of understanding consumers' enduring food-value orientations. These effects will also be of interest to policy makers and health advocates who hope consumers will use calorie information to make more healthful food consumption decisions. Further, by understanding the enduring food-value orientations of their target markets, findings from the first essay indicate that food marketers and restaurant managers can better anticipate the consequences of menu calorie labeling and design more effective food promotion.

In addition, Essay 2 offers its own unique set of substantive contributions, primarily for management of restaurants and other retail food establishments. Specifically, the series of studies presented in this essay provide management with consumer insights to better understand the consequences of either voluntary or mandatory provision of calorie information to consumers. Findings indicate that the voluntary provision of calorie information has positive outcomes for food retailers; however, these positive outcomes diminish if consumers are aware that the provision of the information is required. This pattern suggests that smaller restaurant chains (i.e., those with fewer than 20 locations) should strongly consider voluntarily providing calorie

information to consumers. Findings also demonstrate that being perceived as a healthful restaurant positively influences consumers' responses. Although the perceived healthfulness of a restaurant is associated with positive retailer-related outcomes, these health perceptions attenuate the positive effects of calorie labeling on consumer responses. Thus, consumers' perceived healthfulness and health positioning of restaurants should be critical concerns for management of restaurants and food retailers.

Structure of the Dissertation

To address the six key objectives of this research focusing on the consequences of calorie information provision on both consumers' choice behaviors and consumers' retailer-related responses, this dissertation includes two distinct essays. To address the first three research objectives, the first essay draws from extant literature to develop a conceptualization based on consumers' food-value orientations that can be used to better understand consumers' food consumption decisions and responses to objective nutrition information provision. Five studies, are conducted to establish the reliability and validity of the three food-value orientation measures. These studies are followed by three experiments, including a restaurant field experiment, that are used to examine the direct and moderating effects of these food-value orientations on meal choice. To address research objectives 4–6, the second essay in this dissertation draws from attribution theory to develop a conceptual framework to examine the interactive effects calorie information provision and a restaurants' perceived healthfulness on consumers' responses to the retailer. Five studies, including two field studies conducted in restaurant settings, are used to address these research objectives and test this conceptual

framework. Both stand-alone essays include an introduction, conceptual framework with corresponding hypotheses, multiple online and field studies and experiments to test these predictions, and a general discussion of the theoretical and substantive contributions of the research. Finally, in the conclusion, a recapitulation of the findings and contributions of the dissertation is provided and a discussion of future research opportunities is offered.

References

- Andrews, J. Craig (2011), "Warnings and Disclosures," in *Communicating Risks and Benefits: An Evidence-Based Users' Guide*, Baruch Fischhoff, Noel T. Brewer, and Julie Downs, eds. Silver Spring, MD: Food and Drug Administration (FDA), U.S. Department of Health and Human Services, 149–162.
- Andrews, J. Craig, Richard G. Netemeyer, and Scot Burton (1998), "Consumer Generalization of Nutrient Content Claims in Advertising," *Journal of Marketing*, 62 (4), 62–75.
- Andrews, J. Craig, Scot Burton, and Jeremy Kees (2011), "Is Simpler Always Better? Consumer Evaluations of Front-of-Package Nutrition Symbols," *Journal of Public Policy & Marketing*, 30 (2), 175–190.
- Balasubramanian, Siva K. and Catherine Cole (2002), "Consumers' Search and Use of Nutrition Information: The Challenge and Promise of the Nutrition Labeling Act," *Journal of Marketing*, 66 (3), 112–127.
- Bassett, Mary T., Tamara Dumanovsky, Christina Huang, Lynn D. Silver, Candace Young, Cathy Nonas, Thomas D. Matte, Sekai Chideya, and Thomas Frieden (2008), "Purchasing Behavior and Calorie Information at Fast-Food Chains in New York City, 2007," *American Journal of Public Health*, 98 (8), 1457–1459.
- Bublitz, Melissa G., Laura A. Peracchio, and Lauren G. Block (2010), "Why Did I Eat That? Perspective on Food Decision Making and Dietary Restraint," *Journal of Consumer Psychology*, 20 (3), 239–258.
- Burton, Scot and Elizabeth H. Creyer (2004), "What Consumers Don't Know Can Hurt them: Consumer Evaluations and Disease Risk Perceptions of Restaurant Menu Items," *Journal of Consumer Affairs*, 38 (1), 121–145.
- Burton, Scot and Jeremy Kees (2012), "Flies in the Ointment? Addressing Potential Impediments to Population-Based Health Benefits of Restaurant Menu Labeling Initiatives," *Journal of Public Policy & Marketing*, 31 (2), 232–239.
- Burton, Scot, Elizabeth H. Creyer, Jeremy Kees, and Kyle Huggins (2006), "Attacking the Obesity Epidemic: The Potential Health Benefits of Providing Nutrition Information in Restaurants," *American Journal of Public Health*, 96 (9), 1669–1675.
- Burton, Scot, Elizabeth Howlett, and Andrea Heintz Tangari (2009), "Food for Thought: How Will the Nutrition Labeling of Quick Service Menu Items Influence Consumers' Product Evaluations, Purchase Intentions, and Choices?," *Journal of Retailing*, 85 (3), 258–273.
- Burton, Scot, Judith A. Garretson, and Anne M. Velliquette (1999), "Implications of Accurate Usage of Nutrition Facts Panel Information for Food Product Evaluations and Purchase Intentions," *Journal of the Academy of Marketing Science*, 27 (4), 470–480.

- Berrington de Gonzalez, Amy, Patricia Hartge, James R. Cerhan, Alan J. Flint, Lindsay Hannan, Robert J. MacInnis, Steven C. Moore, Geoffrey S. Tobias, Hoda Anton-Culver, Laura Beane Freeman, W. Lawrence Beeson, Sandra L. Clipp, Dallas R. English, Aaron R. Folsom, D. Michal Freedman, Graham Giles, Niclas Hakansson, Katherine D. Henderson, Judith Hoffman-Bolton, Jane A. Hoppin, Karen L. Koenig, I-Min Lee, Martha S. Linet, Yikyung Park., Gaia Pocobelli, Arthur Schatzkin, Howard D. Sesso, Elisabete Weiderpass, Bradley J. Willcox, Alicja Wolk, Anne Zeleniuch-Jacquotte, Walter C. Willett, and Michael J. Thun (2010), “Body-Mass Index and Mortality Among 1.46 Million White Adults,” *The New England Journal of Medicine*, 363 (23), 2211–2219.
- Centers for Disease Control and Prevention (CDC) (2017), “Nutrition, Physical Activity and Obesity: Data, Trends and Maps,” (accessed March 26, 2017), [available at https://nccd.cdc.gov/NPAO_DTM/IndicatorSummary.aspx?category=28&indicator=29&year=2014&yearId=18].
- Chandon, Pierre and Brian Wansink (2007), “The Biasing Health Halos of Fast-Food Restaurant Health Claims: Lower Calorie Estimates and Higher Side Dish Consumption Intentions,” *Journal of Consumer Research*, 34 (3), 301–314.
- Cheema, Amar and Vanessa M. Patrick (2008), “Anytime Versus Only: Mind-Sets Moderate the Effect of Expansive Versus Restrictive Frames on Promotion Evaluation,” *Journal of Marketing Research*, 45 (4), 462–472.
- Christakis, Nicholas A. and James H. Fowler (2007), “The Spread of Obesity in a Large Social Network Over 32 Years,” *New England Journal of Medicine*, 357 (3), 370–379.
- Downs, Julie S., Jessica Wisdom, Brian Wansink, and George Loewenstein (2013), “Supplementing Menu Labeling with Calorie Recommendations to Test for Facilitation Effects,” *American Journal of Public Health*, 103 (9), 1604–1609.
- Economic Research Service (ERS), United States Department of Agriculture (USDA) (2017), “Food Expenditures,” (accessed February 6, 2017), [available at <http://www.ers.usda.gov/data-products/food-expenditures.aspx>].
- Elbel, Brian, Joyce Gyamfi, and Rogan Kersh (2011), “Child and Adolescent Fast Food Choice and the Influence of Calorie Labeling: A Natural Experiment,” *International Journal of Obesity*, 35 (4), 493–500.
- Elbel, Brian, Rogan Kersh, Victoria L. Brescoll, and L. Beth Dixon (2009), “Calorie Labeling and Food Choices: A First Look at the Effects on Low-Income People in New York City,” *Health Affairs*, 28 (6), 1110–1121.
- Ellen, Pam Scholder, Lois A. Mohr, and Deborah J. Webb (2000), “Charitable Programs and the Retailer: Do They Mix?,” *Journal of Retailing*, 76 (3), 393–406.

- Ellison, Brenna, Jayson L. Lusk, and David Davis (2014), “The Effect of Calorie Labels on Caloric Intake and Restaurant Revenue: Evidence from Two Full-Service Restaurants,” *Journal of Agricultural and Applied Economics*, 46 (2), 173–191.
- Falkner, Nicole H., Dianne Neumark-Sztainer, Mary Story, Robert W. Jeffery, Trish Beuhring, and Michael D. Resnick, “Social, Educational, and Psychological Correlates of Weight Status in Adolescents,” *Obesity Research*, 9 (1), 32–42.
- Finkelstein, Eric A., Justin G. Trogdon, Joel W. Cohen, and William Dietz (2009), “Annual Medical Spending Attributable to Obesity: Payer-and-Service-Specific Estimates,” *Health Affairs*, 28 (5), 822–831.
- Finkelstein, Eric A., Kiersten L. Strombotne, Nadine L. Chan, and James Krieger (2011), “Mandatory Menu Labeling in One Fast-Food Chain in King County, Washington,” *American Journal of Preventive Medicine*, 40 (2), 122–127.
- Flegal, Katherine M., Barry I. Graubard, David F. Williamson, and Mitchell H. Gail (2005), “Excess Deaths Associated with Underweight, Overweight, and Obesity,” *JAMA*, 293 (15), 1861–1867.
- Folkes, Valerie S. (1988), “Recent Attribution Research in Consumer Behavior: A Review and New Directions,” *Journal of Consumer Research*, 14 (4), 548–565.
- Food and Drug Administration (FDA) (2016), “A Labeling Guide for Restaurants and Retail Establishments Selling Away-From-Home Foods-Part II (Menu Labeling Requirements in Accordance with the Patient Protection Affordable Care Act of 2010); Guidance for Industry; Availability,” *Federal Register*, 81 (87), 27067–27068.
- Food and Drug Administration (FDA) (2014), “Food Labeling; Nutrition Labeling of Standard Menu Items in Restaurants and Similar Retail Food Establishments,” *Federal Register*, 79 (230), 71155–71259.
- Food and Drug Administration (FDA) (2017), “Food Labeling; Nutrition Labeling of Standard Menu Items in Restaurants and Similar Retail Food Establishments; Extension of Compliance Date; Request for Comments,” *Federal Register*, 82 (85), 20825–20829.
- Food and Drug Administration (FDA) (1993), “Food Labeling Regulations: Implementing the Nutrition Labeling and Education Act of 1990; Opportunity for Comments,” *Federal Register*, 58 (3), 2066–2941.
- Food and Drug Administration (FDA) (2010), “Front-of-Pack and Shelf Tag Nutrition Symbols; Establishment of Docket: Request for Comments and Information,” *Federal Register*, 75 (82), 22602–22606.
- Ford, Gary T., Manoj Hastak, Anusree Mitra, and Debra Jones Ringold (1996), “Can Consumers Interpret Nutrition Information in the Presence of a Health Claim? A Laboratory Investigation,” *Journal of Public Policy & Marketing*, 15 (1), 16–27.

- Forehand, Mark R. and Sonya Grier (2003), "When Is Honesty the Best Policy? The Effect of Stated Company Intent on Consumer Skepticism," *Journal of Consumer Psychology*, 13 (3), 349–356.
- Garretson, Judith and Scot Burton (2000), "The Nutrition Facts Panel and Package Claims: The Role of Nutrient Values, Multiple Claims, and Congruent Information on Attitudes, Disease-Related Risks, and Consumer Trust," *Journal of Public Policy & Marketing*, 19 (2), 213–227.
- Goldman, T.R. (2015), "The FDA's Menu-Labeling Rule. Many Restaurants Will Soon Be Required to List the Calorie Count of the Food They Sell," *Health Affairs*, (accessed February 6, 2017), [available at http://healthaffairs.org/healthpolicybriefs/brief_pdfs/healthpolicybrief_140.pdf].
- Guthrie, Joanne F., Biing-Hwan Lin, and Elizabeth Frazão (2002), "Role of Food Prepared Away from Home in the American Diet, 1977–78 versus 1994–96: Changes and Consequences," *Journal of Nutrition Education and Behavior*, 34 (3), 140–150.
- Grewal, Dhruv and Michael Levy (2007), "Retailing Research: Past, Present, and Future," *Journal of Retailing*, 83 (4), 447–464.
- Harnack, Lisa J. and Simone A. French (2008), "Effect of Point-of-Purchase Calorie Labeling on Restaurant and Cafeteria Food Choices: A Review of the Literature," *International Journal of Behavioral Nutrition and Physical Activity*, 5 (1).
- Harnack, Lisa J., Simone A. French, J. Michael Oakes, Mary T. Story, Robert W. Jeffery, and Sarah A. Rydell (2008), "Effects of Calorie Labeling and Value Size Pricing on Fast Food Meal Choices: Results from an Experimental Trial," *International Journal of Behavioral Nutrition and Physical Activity*, 5 (63).
- Howlett, Elizabeth A., Scot Burton, and John Kozup (2008), "How Modification of the Nutrition Fact Panel Influences Consumers at Risk for Heart Disease: The Case of Trans Fat," *Journal of Public Policy & Marketing*, 27 (1), 83–97.
- Howlett, Elizabeth A., Scot Burton, Kenneth Bates, and Kyle Huggins (2009), "Coming to a Restaurant Near You? Potential Consumer Responses to Nutrition Information Disclosure on Menus," *Journal of Consumer Research*, 36 (3), 494–503.
- International Food Information council (IFIC) (2012), "2012 Food & Health Survey: Consumer Attitudes Toward Food Safety, Nutrition & Health," (accessed February 7, 2017), [available at http://www.foodinsight.org/2012_Food_Health_Survey_Consumer_Attitudes_toward_Food_Safety_Nutrition_and_Health].
- Keller, Scott B., Mike Landry, Jeanne Olson, Anne M. Velliquette, Scot Burton, and J. Craig Andrews (1997), "The Effects of Nutrition Package Claims, Nutrition Facts Panels, and Motivation to Process Nutrition Information on Consumer Product Evaluations," *Journal of Public Policy & Marketing*, 16 (2), 256–269.

- Kelley, Harold H. (1973), "The Processes of Causal Attribution," *American Psychologist*, 28 (2), 107–128.
- Kelley, Harold H. (1967), "Attribution Theory in Social Psychology," *Nebraska Symposium on Motivation*, 15, 192–238.
- Kozup, John C., Elizabeth H. Creyer, and Scot Burton (2003), "Making Healthful Food Choices: The Influence of Health Claims and Nutrition Information on Consumers' Evaluations of Packaged Food Products and Restaurant Menu Items," *Journal of Marketing*, 67 (2), 19–34.
- Lin, Biing-Hwan, Joanne Guthrie, and Elizabeth Frazão (1999), "Nutrition Contribution of Food Away from Home," *America's Eating Habits: Changes and Consequences*, 213–242.
- Loewenstein, George (2011), "Confronting Reality: Pitfalls of Calorie Posting," *The American Journal of Clinical Nutrition*, 94 (4), 679–680.
- Long, Michael W., Deirdre K. Tobias, Angie L. Craddock, Holly Batchelder, and Steven L. Gortmaker (2015), "Systematic Review and Meta-Analysis of the Impact of Restaurant Menu Calorie Labeling," *American Journal of Public Health*, 105 (5), 11–24.
- Moorman, Christine (1996), "A Quasi Experiment to Assess the Consumer and Informational Determinants of Nutrition Information," *Journal of Public Policy and Marketing*, 15 (1), 28–44.
- Newman, Christopher L., Elizabeth Howlett, and Scot Burton (2016), "Effects of Objective and Evaluative Front-of-Package Cues on Food Evaluation and Choice: The Moderating Influence of Comparative and Noncomparative Processing Contexts," *Journal of Consumer Research*, 42 (5), 749–766.
- Newman, Christopher L., Elizabeth Howlett, and Scot Burton (2014), "Shopper Response to Front-of-Package Nutrition Labeling Programs: Potential Consumer and Retail Store Benefits," *Journal of Retailing*, 90 (1), 13–26.
- Nielsen (2015), "We Are What We Eat: Healthy Eating Trends Around the World," (accessed February 7, 2017), [available at <http://www.nielsen.com/content/dam/niensenglobal/eu/nielseninsights/pdfs/Nielsen%20Global%20Health%20and%20Wellness%20Report%20-%20January%202015.pdf>].
- Nestle, Marion (2003), "Increasing Portion Sizes in American Diets: More Calories, More Obesity," *Journal of the Academy of Nutrition and Dietetics*, 103 (1), 39–40.
- Parker, Jeffrey R. and Donald R. Lehmann (2014), "How and When Grouping Low-Calorie Options Reduces the Benefits of Providing Dish-Specific Calorie Information," *Journal of Consumer Research*, 41 (1), 213–235.

- Pomeranz, Jennifer L. and Kelly D. Brownell (2008), “Legal and Public Health Considerations Affecting the Success, Reach, and Impact of Menu-Labeling Laws,” *American Journal of Public Health*, 98 (9), 1578–1583.
- Puccinelli, Nancy M., Ronald C. Goodstein, Dhruv Grewal, Robert Price, Priya Raghuram, and David Stewart (2009), “Customer Experience Management in Retailing: Understanding the Buying Process,” *Journal of Retailing*, 85 (1), 15–30.
- Puhl, Rebecca M. and Chelsea A. Heuer (2010), “Obesity Stigma: Important Considerations for Public Health,” *American Journal of Public Health*, 100 (6) 1019–1028.
- Roberto, Christina A., Marlene B. Schwartz, and Kelly D. Brownell (2009), “Rationale and Evidence for Menu-Labeling Legislation,” *American Journal of Preventive Medicine*, 37 (6), 546–551.
- Roberto, Christina A., Peter D. Larsen, Henry Agnew, Jenny Baik, and Kelly D. Brownell (2010), “Evaluating the Impact of Menu Labeling on Food Choices and Intake,” *American Journal of Public Health*, 100 (2), 312–318.
- Rudd Center for Food Policy and Obesity (2008), “Menu Labeling in Chain Restaurants: Opportunities for Public Policy,” (accessed February 5, 2017), [available at <http://www.uconnruddcenter.org/files/Pdfs/RuddMenuLabelingReport2008.pdf>].
- Stewart, David W. and Ingrid M. Martin (2004), “Advertising Disclosures: Clear and Conspicuous or Understood and Used?,” *Journal of Public Policy & Marketing*, 23 (2), 183–192.
- Stewart, David W. and Ingrid M. Martin (1994), “Intended and Unintended Consequences of Warning Messages: A Review and Synthesis of Empirical Research,” *Journal of Public Policy & Marketing*, 3 (1), 1–19.
- Todd, Jessica E., Lisa Mancino, and Biing-Hwan Lin (2010), “The Impact of Food Away from Home on Adult Diet Quality,” *Economic Research Report* (Number 90), (accessed February 6, 2017), [available at https://www.ers.usda.gov/webdocs/publications/err90/8170_err90_1_.pdf].
- Trivedi, Minakshi (2011), “Regional and Categorical Patterns in Consumer Behavior: Revealing Trends,” *Journal of Retailing*, 87 (1), 18–30.
- Seiders, Kathleen and Ross D. Petty (2004), “Obesity and the Role of Food Marketing: A Policy Analysis of Issues and Remedies,” *Journal of Public Policy & Marketing*, 23 (2), 153–169.
- Swartz, Jonas J., Danielle Braxton, and Anthony J. Viera (2011), “Calorie Menu Labeling on Quick-Service Restaurant Menus: An Updated Systematic Review of the Literature,” *International Journal of Behavioral Nutrition and Physical Activity*, 8 (1).

- Tandon, Pooja S., Chuan Zhou, Nadine L. Chan, Paula Lozano, Sarah C. Couch, Karen Glanz, James Krieger, and Brian Saelens (2011), “The Impact of Menu Labeling on Fast-Food Purchases for Children and Parents,” *American Journal of Preventive Medicine*, 41 (4), 434–438.
- Todd, Jessica E., Lisa Mancino, and Biing-Hwan Lin (2010), “The Impact of Food Away from Home on Adult Diet Quality,” *Economic Research Report* (Number 90), (accessed February 6, 2017), [available at https://www.ers.usda.gov/webdocs/publications/err90/8170_err90_1_.pdf].
- VanEpps, Eric M., Christina A. Roberto, Sara Park, Christina D. Economos, and Sara N. Bleich (2016), “Restaurant Menu Labeling Policy: Review of Evidence and Controversies,” *Current Obesity Reports*, 5 (1), 72–80.
- Variyam, Jayachandran (2005), “Nutrition Labeling in the Food-Away-From-Home Sector: An Economic Assessment,” *Economic Research Report* (Number 9), (accessed February 6, 2017), [available at https://www.ers.usda.gov/webdocs/publications/err4/29781_err4_002.pdf?v=41414].
- Wansink, Brian, and Pierre Chandon (2006), “Can ‘Low-Fat’ Nutrition Labels Lead to Obesity,” *Journal of Marketing Research*, 43 (4), 605–617.
- Wisdom, Jessica, Julie S. Downs, and George Loewenstein (2010), “Promoting Healthy Choices: Information versus Convenience,” *American Economic Journal: Applied Economics*, 2 (2), 164–178.

ESSAY 1

**UNDERSTANDING AWAY-FROM-HOME FOOD CHOICES AND RESPONSES TO
CALORIE INFORMATION PROVISION: DEVELOPMENT AND MARKETPLACE
ASSESSMENT OF CONSUMERS' FOOD-VALUE ORIENTATIONS**

Abstract

Due to rising obesity rates and changes to the information environment aimed at reducing these rates, understanding drivers of consumers' food consumption behaviors is an important issue for consumer researchers. To provide insight into this critical issue, this research offers a conceptualization regarding food-value orientations, develops valid multi-item measures, and demonstrates how these new food-value orientation measures moderate responses to objective nutrition information provision. Two initial studies are conducted to establish item convergence, dimensionality, discriminant validity, and nomological validity of three orientation measures—health-value orientation, taste-value orientation, and quantity-value orientation. An initial field study then supports expected group differences and provides further tests of predictive validity. Next, a fourth study establishes predictive validity for these newly developed measures in a food promotion context. Finally, three application experiments examine the direct and moderating influence that these food-value orientations have on meal choice. Findings from a cross-sectional online experiment, a longitudinal online experiment, and restaurant field experiment all show that food-value orientations are associated with asymmetric responses to calorie labeling on restaurant menus. Calorie information provision effectively *decreases* the number of calories ordered by consumers who are health-value oriented but *increases* the calorie levels ordered by quantity- and taste-value oriented consumers. The theoretical contributions related the asymmetric effects of objective calorie information and implications of findings for consumer well-being and public policy are offered.

Introduction

Better understanding consumers' food choices has become a critical issue that is motivating extensive consumer research (e.g., Bagchi and Block 2011; Bublitz, Peracchio, and Block 2010; Briers and Laporte 2013; Chandon and Wansink 2007; Garg, Wansink, and Inman 2007; Haws and Winterich 2013; Howlett et al. 2009; Ma, Ailawadi, Grewal 2013; Newman, Howlett, and Burton 2016; Nikolova and Inman 2015; Parker and Lehmann 2014; Scott et al. 2008; Sengupta and Zhou 2007; VanEpps, Downs, and Loewenstein 2016a; 2016b; Wansink and Chandon 2006; Wilcox et al. 2009). The number of calories consumed per day in the United States has risen substantially over the past three decades, and now over 64% of adults in the United States are either overweight or obese (CDC 2017; ERS 2017). The high prevalence of obesity has resulted in calls for dramatic action to improve the nation's health. Thus, menu calorie labeling, designed to help consumers make more healthful food choices, will soon become mandatory nationwide (FDA 2014; 2016; 2017). However, most field experiments have found little effect of objective calorie information provision on consumption behavior for food choices made in restaurants (e.g., Long et al. 2015). This research constructs a conceptual framework and develops psychometrically sound multi-item scales to improve our understanding of how consumers' food-value orientations impact their food choices and responses to objective nutrition information provision.

In contrast to prior research, consumers' food consumption decisions are considered in this research from a multifaceted *food-value orientation* perspective. More specifically, measures for three food-value orientations are constructed, and then it is empirically demonstrated that these constructs drive consumers' food purchase decisions and moderate the effects of calorie

information provision. For example, consider how you typically evaluate the perceived value of a restaurant meal. When considering the value of various meal options, do you normally choose meals that are especially large and filling, meals that are extremely tasty, or meals that are particularly healthful? While recognizing these three factors (i.e., quantity, taste, and healthfulness) are not necessarily mutually exclusive and that consumers will not *always* follow their predisposition, consumers are likely more or less oriented toward the values derived from these three factors (e.g., Glanz et al. 1998). That is, some consumers are more typically attracted to enhancing the amount of food received for the money spent on the meal, while others opt to focus primarily on the taste or healthfulness of the meal. Psychometrically sound measures of these enduring food-value orientations are expected to detect direct influences on consumers' food consumption decisions and interactions with cues provided (e.g., objective nutrition information) in the choice environment.

Furthermore, consumers' food-value orientations have important implications for consumer health and well-being and for public policy. In addition to their direct influence, because objective information is often processed and utilized in unexpected ways (Stewart and Martin 1994), food-value orientations are also expected to moderate consumers' responses to calorie information provision. Consequently, these enduring orientations need to be taken into direct consideration in the evaluation of the success or failure of initiatives aimed at improving food choices associated with consumer health and well-being. Specifically, the Affordable Care Act (Public Law 111-148), signed into law in 2010, requires the provision of calorie information on menus and menu boards for chain restaurants with 20 or more locations; the provision of this information will become mandatory beginning in May 2018 (FDA 2014; 2016; 2017). While many policy makers and members of the public health community have argued that calorie

information provision on restaurant menus will encourage consumers to choose more healthful food items and consequently reduce the high prevalence of obesity, very little empirical research supports this assumption. More specifically, extant research from controlled field experiments has found little evidence that calorie information provision on restaurant menus will substantially reduce calories ordered (see Long et al. 2015 for review).

Given the important consumer health, marketing, and policy implications associated with menu calorie labeling, the measures developed based on this food-value orientation framework are used to help better understand the intended and unintended consequences (Stewart and Martin 1994) of the recently implemented menu calorie labeling mandate. Differences in consumers' food-value orientations are likely to influence how consumers utilize and respond to calorie information. These differences likely result in asymmetric effects of calorie information provision that influence consumer choice outcomes that are not well-understood, despite their serious implications for consumer well-being. This research provides insight into this issue by demonstrating that food-value orientations are enduring, consumer characteristics that have critical direct and moderating effects on consumers' food consumption decisions.¹ Thus, the objectives of this research are to: (1) initially develop measures to assess consumers' food-value orientations, (2) demonstrate reliability, discriminant, convergent, nomological validity, predictive validity, and expected group differences for the measures, and (3) empirically demonstrate how these food-value orientation measures influence consumer choice outcomes

¹ Consumers obviously will not always choose items that directly align with their orientations (situational and contextual variables are also influential). However, in the majority of instances and for most consumers, consumers' food-value orientations should be related to food attitudes and behaviors.

and are associated with differing consumer responses to the provision of calorie information on restaurant menus.

A series of seven studies are presented to achieve these objectives. I first assimilate theory and literature on consumers' perceptions of food value to offer a conceptual framework for developing measures of consumers' food-value orientations. Following the discussion of this conceptual framework, review of relevant literature, and development of specific hypotheses, multi-item measures of the food-value orientations are developed and the internal consistency and validity of these measures are assessed (Studies 1–4). Using these psychometrically sound measures, three application experiments are conducted, including a restaurant field experiment, to test the hypotheses and demonstrate the importance and usefulness of these measures. In these experiments, the direct and moderating effects of these food-value orientations on total calories ordered are tested, which is a primary outcome for consumer health well-being and understanding forthcoming changes in the new law requiring disclosures by restaurant chains. Specifically, both a between-subjects and pretest-posttest longitudinal experiment with a control group—designed to simulate the upcoming marketplace change that will occur when chain restaurants roll-out nationwide menu calorie labeling—are used to test the hypothesized direct and moderating role of consumers' orientations. A restaurant field experiment is then conducted to bolster the external validity of these findings, which is especially important given the differences in the effects of calorie labeling on calories ordered in laboratory experiments compared to field experiments in prior research (Long et al. 2015). Results show that the food-value orientation measures developed in this research moderate the effect of the provision of objective calorie information, resulting in some intended, as well as some unintended, consequences. These findings demonstrate the importance of considering the direct and

moderating role of consumers' food-value orientations when examining food consumption decisions and evaluating the effectiveness of objective information provision. Finally, a discussion of the conceptual contributions, the implications of these findings for consumers and public policy, and future research utilizing these food-value orientation measures is offered.

Consumers' Food-Value Orientations

Brief overview of the literature and conceptual framework for food-value orientations

Consumers seek out and choose products that maximize perceived value (Dodds, Monroe, and Grewal 1991; Zeithaml 1988). Perceived value has been defined as “the consumer’s overall assessment of the utility of a product based on what is received and what is given” (Zeithaml 1988, p. 14). Thus, perceived value is positively influenced by the benefits consumers expect to receive when acquiring and consuming a product and negatively influenced by the costs related to the exchange (Grewal, Monroe, and Krishnan 1998; Monroe and Krishnan 1985). The perceived *value of food choices* is conceptually similar; the perceptions of the benefits received from the food options are evaluated relative to the costs incurred.

An initial review of the food choice literature revealed no existing psychometrically sound multi-item measures focusing on benefits received for monetary resources expended. However, it well-known that consumers often consider several salient product characteristics to evaluate food alternatives, including taste, quantity, and healthfulness (e.g., Connors et al. 2001; Furst et al. 1996; Glanz et al. 1998). While each of these characteristics may be relevant to *most* consumers, the relative value derived from food alternatives, and hence choice options, likely varies across consumers (Finkelstein et al. 2011; Glanz et al. 1998). In terms of the costs borne

by consumers for restaurant food choices, in this research, the focus concerns price paid (Zeithaml 1988). For example, when making a food choice at a restaurant, given a specific amount charged for the meal, one consumer may be more oriented toward obtaining a healthful option, while others may be more strongly oriented toward enhancing taste-value or quantity-value. All three of these food dimensions are likely to have *some* level of importance to most consumers, but it is proposed that these orientations *generally* guide consumers in evaluating the desirability of restaurant menu choice options for the funds exchanged.

The effects of food-value orientations on meal choice

Based on the conceptual framework offered here, consumers' enduring food-value orientations should directly influence meal choices and moderate effects of cues in the contextual food item evaluation environment. Taste is clearly an important and significant driver of food choice for most all consumers (Glanz et al. 1998). However, many consumers are also very concerned about a food's health-value (Kozup, Howlett and Burton 2003; Keller et al. 1997). Similarly, the quantity of food received for a given price may be a primary factor influencing the perception of value and choice (Loewenstein 2011). Perceived meal healthfulness is generally *negatively* related both to taste expectations (Raghunathan, Naylor, and Hoyer 2006) and quantity expectations (Suher, Raghunathan, and Hoyer 2016). In terms of predictive validity, consumers who value health should strive to make more healthful food consumption decisions by ordering meals that they expect to be healthful and nutritious while placing somewhat less emphasis on taste and quantity. Similarly, consumers oriented toward taste-value or quantity-value should prefer restaurant fare that best aligns with their orientations (with less relative concern about healthfulness). Based on this conceptualization, consumers should also be more likely to respond favorably to food promotion that aligns with their food-value orientations.

These predictions are consistent with the conceptual framework and are used as basic tests of the predictive validity of the food-value orientation measures. Studies 1 and 2 focus on the development of the scales and establishing support for the reliability, discriminant validity, and nomological validity, Study 3 uses an initial field study to assess expected group differences and predictive validity, and Study 4 further supports the predictive validity of two of the food-value orientation measures in a food promotion context. Studies 4–7 then demonstrate the importance and usefulness of these food-value orientations in understanding consumers’ response to the forthcoming calorie labeling marketplace change.

Direct and Moderating Effects of Food-Value Orientations on Meal Choice

Effects of food-value orientations on meal calories ordered

Given that consumers typically attempt to order meals that align with their food-value orientations, these food-value orientation measures can likely be used to better predict the objective healthfulness of consumers’ food choices. For example, food-value orientations should be associated with the number of calories ordered by consumers in restaurant settings. Given an orientation toward health, health-value orientation (HVO) is predicted to be negatively related to the number of meal calories ordered. In contrast, because consumers tend to have a “tasty = unhealthy” intuition (Raghunathan, Naylor, and Hoyer 2006), it is proposed that taste-oriented consumers will infer that lower calories are associated with decreased tastiness, and they will choose higher calorie foods to maximize taste. Similarly, because food volume is generally *positively* related to calorie level and consumers tend to have a “healthy = less filling” intuition (Loewenstein 2011; Suher, Raghunathan, and Hoyer 2016), quantity-oriented consumers will

choose higher calorie foods in their efforts to enhance quantity-value. In sum, taste-value orientation (TVO) and quantity-value orientation (QVO) are predicted to be *positively* related to the number of calories ordered.² Formal predictions for influence of each of the three food-value orientations on meal calories ordered are offered below.

H1: Consumers' (a) HVO will be *negatively* related to the number of meal calories ordered, while consumers' (b) TVO and (c) QVO will be *positively* related to meal calories ordered.

Consumers' response to calorie information provision on restaurant menus

Background on menu calorie labeling. Restaurant meals have been an obvious target for nutrition information disclosures aimed at decreasing obesity, particularly as the number of meals consumed away from home has continued to increase (e.g., Downs et al. 2013). In addition, restaurant meals are generally higher in calories and lower in overall nutrition quality than meals prepared at home (Roberto, Schwartz, and Brownell 2009). However, consumers generally have very little knowledge of the calorie and nutrient levels of foods prepared in restaurants since nutrition labeling has not been mandatory (Burton, Howlett, and Tangari 2009; Chandon and Wansink 2007). Further, many consumers, and even dietitians, *drastically* underestimate the calorie counts, fat content, and sodium levels of the least healthful restaurant foods (Burton et al. 2006; Wansink and Chandon 2006). These findings suggest that the provision of objective calorie information on restaurant menus could have beneficial outcomes

² TVO and QVO are likely less strongly related to calories ordered than is HVO because these orientations are not as closely aligned with objective calorie levels of food items. The relationships between perceived taste and perceived quantity with objective meal calories likely vary somewhat across restaurants, whereas the relationship between perceived healthfulness and objective calories is likely somewhat stronger and more stable.

on consumer health by reducing the number of calories ordered by consumers and ultimately their calorie consumption.

While many states, cities, and counties around the United States have required menu calorie labeling for chain restaurants since as early as 2009 (Roberto, Schwartz, and Brownell 2009), restaurant chains nationwide will be required to do so beginning in May 2018 (FDA 2017). In addition, management of restaurants with less than 20 outlets can choose whether to voluntarily provide calorie information. This legislation was passed even though mounting empirical evidence suggests that calorie information provision does not change consumers' consumption behaviors in restaurant settings (see Appendix 1.1). Based on results from a meta-analysis examining the effectiveness of menu calorie labeling, it has been concluded that “despite broad interest among the public health research community and the passage of national menu calorie labeling legislation, there is minimal evidence to support menu calorie labeling as a strategy to directly influence consumer behavior to substantially reduce calories purchased at restaurants” (Long et al. 2015, p. e21-e22).

Findings from this recent meta-analysis show that calorie labeling results in a *nonsignificant* 7.6 calorie decrease in calories ordered in controlled restaurant experiments (Long et al. 2015). However, this finding may be misleading if, as suggested by the conceptual framework offered here, the overall effects of calorie labeling are obscured by differences in consumers' food-value orientations. Although a multitude of factors may potentially influence consumer response to information disclosures, understanding how differences in desired food value influence how consumers attend to and use calorie information seems critical (Stewart and Martin 2004). The lack of overall market-based effects of calorie disclosures is likely due to differences in consumers' food-value orientations that obscure both *increases* and *decreases* in

the number of calories ordered (Burton and Kees 2012). This proposed asymmetric response to calorie information provision has not been previously measured or considered in prior market-based field studies (e.g., Long et al. 2015).

Moderating roles of food-value orientation measures on responses to calorie labeling.

Consumers likely have a semantic network of food attributes (e.g., concepts such as calorie level, healthfulness, taste, quantity) that are linked in their memory networks (Anderson 1983; Sowa 2014). According to activation theory, when one concept is triggered by exposure to objective information (e.g., food item calorie level), activation is spread to other related concepts (e.g., overall healthfulness, taste, expected size of the meal). Thus, when relatively little is known about a specific menu item, consumers may use any available information to make inferences about the product that extend beyond the specific objective information provided (Andrews, Netemeyer, and Burton 1998; Ross and Creyer 1992; Sowa 2014). The strength of these inferences is greater when there is a stronger conceptual association between the product attributes (e.g., calorie level may be more closely related to the concept of healthfulness than taste), and this activation process diminishes as concepts spread further from the more focal concepts in the network (Andrews, Netemeyer, and Burton 1998; Broniarczyk and Alba 1994; Sowa 2014).

Based on the conceptualization offered here and measures developed for consumers' food-value orientations, "low calorie" should be *positively* related to perceived "healthfulness," but *negatively* related to perceptions of "tastiness" and "quantity." For example, since consumers tend to have an "unhealthy = tasty" intuition (Raghunathan, Naylor, and Hoyer 2006), consumers are likely to infer that higher (lower) calorie menu items are more (less) tasty. Related research also shows that consumers also tend to have a "healthy = less filling" intuition (Suher,

Raghunathan, and Hoyer 2016). Thus, consumers are likely to infer that higher (lower) calorie items are more (less) filling. This intuition exists because, when considering unhealthy food, consumers generate exemplars of large portion sizes and dense, filling foods; in addition, past restaurant experiences remind consumers that unhealthy food is often served in large portion sizes (Suher, Raghunathan, and Hoyer 2016; Wansink 2006; Young and Nestle 2012). In turn, consumers use these inferences about taste and quantity (based on objective calorie information) in attempts to align with their individual food-value orientations. That is, taste-value oriented and quantity-value oriented consumers use calorie information to identify choice options likely to maximize taste-value and quantity-value, respectively. This suggests that taste-value oriented and quantity-oriented consumers should *typically* select higher calorie meal choices in response to menu labeling. From a public health perspective, this would appear to be a surprising, unanticipated consequence of information provision; however, from a consumer perspective, the information is simply used to enhance the perceived value of the choice.

The concepts of calories and healthfulness are likely to be strongly associated in consumers' semantic networks, so consumers' who value health when making food consumption decisions generally should try to order more healthful, lower calorie options. However, ordering healthful meals can be difficult in limited information environments where expected calorie levels are often substantially lower than actual calorie levels (Burton et al. 2006; Wansink and Chandon 2006). Thus, calorie information provision should provide useful information for high HVO consumers when making inferences about missing product attributes (e.g., product healthfulness), and this information should help them improve decisions regarding specific menu items. Therefore, calorie disclosure is likely to be an effective way to reduce calorie consumption

among consumers with a high HVO; calorie information provision will be *much less* effective for those lower in HVO (H3).

In sum, reliable and valid measures of consumers' food-value orientations should reveal both a direct and moderating influence on food calorie levels since the objective nutrition information can be used to maximize different food values. This conceptualization suggests asymmetric effects of calorie information provision across food-value orientations on the number of calories in a meal choice. Specifically, the combined effects of consumers' HVO and the calorie information provision by HVO interaction will have a *negative* influence, reducing the number of calories ordered (H4a). However, the combined effects of TVO, QVO, the calorie information provision by TVO interaction, and the calorie information provision by QVO interaction should have a *positive* influence, increasing the number of calories ordered (H4b). From a health policy perspective, this (unintended) *increase* in calories ordered due to the direct and moderating effects of taste-value and quantity-value orientations offers a countervailing influence to the (intended) *decrease* in calories ordered resulting from the effects of HVO and calorie information provision. This proposed moderation offers a strong test of predictive validity and usefulness of the measures developed. When considered in aggregate, the increases and decreases in the level of calories in selected meals due to calorie disclosures and consumers' food-value orientations should counterbalance one another (H4c), offering a plausible and likely explanation for the plethora of nonsignificant effects found in restaurant field experiments (see Appendix 1.1).

H2: Consumers' HVO will moderate the effect of calorie information provision on meal calories ordered. While calorie information will decrease the calories

ordered by consumers with higher HVO, this effect will be attenuated for consumers with a lower HVO.

H3a: The aggregated effects from consumers' HVO, calorie information provision, and the HVO x calorie information provision interaction will have a *negative* influence on the calorie levels of chosen meals.

H3b: The aggregated effects of consumers' TVO, QVO, and the interaction of each of these orientations with calorie information provision will have a *positive* influence on the calorie levels of chosen meals.

H3c: The aggregated effects from calorie information provision and consumers' HVO, TVO, and QVO will result in *no overall* effect on the calorie levels of chosen meals.

A between-subjects experiment (Study 5), a pretest-post-test longitudinal experiment with a control group (Study 6), and a between-subjects field experiment conducted in a restaurant setting (Study 7) will be used to assess these critical moderating effects of the food-value orientation measures on the effect of objective calorie information provision on meal calories ordered.

Study 1

Method

Procedure. For the initial development of items, drawing from the conceptualizations of the three food-value orientation constructs and extant literature (Connors et al. 2001; Furst et al. 1996; Glanz et al. 1998), an initial pool of 32 scale items was developed to reflect the conceptual

definitions of the food-value orientations. Based on this conceptualization and drawing from extant literature identifying characteristics consumers consider when purchasing food products (Connors et al. 2001; Furst et al. 1996; Glanz et al. 1998), health-value orientation (HVO) is defined as consumers' overall concern for the healthfulness of a food product, given the price that is paid for the product. Further, taste-value orientation (TVO) is defined as the overall concern for the taste of a food product given the price relinquished for the product. Finally, quantity-value orientation (QVO) is defined as the overall concern about the amount of food provided, given the price paid for the product. Each item was designed to reflect only one of the food-value orientations.

Sample. To initially evaluate the proposed food-value orientation items, a survey was administered to a national sample of 310 adults using Amazon's Mechanical Turk (MTurk). The mean age of the sample was 33, 62% (38%) of the sample were female (male), the median annual household income was \$40,000 to \$49,999, and 44% of the participants had obtained a four-year college degree.

Measures. To examine nomological validity and the relationships between the food-value orientation measures and other constructs, measures of nutrition knowledge, nutrition motivation, perceived self-risk of heart disease or stroke, body mass index (BMI), and demographics were included. Subjective nutrition knowledge was measured using three seven-point scale items ($\alpha = .92$; Burton, Garretson, and Velliquette 1999). Motivation to process nutrition information was measured with three seven-point items ($\alpha = .94$; Howlett et al. 2009; Keller et al. 1997; Moorman 1990). Perceived health-risk was measured using three seven-point items ($\alpha = .92$): "Compared with other men and women of your age, do you consider your risk of heart disease or stroke to be:" with endpoints of "much lower than others/much higher than

others,” “less likely/more likely,” and “much better than average/much worse than average.” To calculate participants’ BMI, the height and weight of each participant were collected.

Demographics included gender, education, and household income (nine categories ranging from “less than \$30,000” to “\$100,000 or more”).

Results

Item purification. Items were initially evaluated for each food-value orientation using principal-axis factor analysis. Prior to conducting principal-axis factor analysis, Bartlett’s test of sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy both indicated that the data were appropriate for factor analysis. In an initial factor analysis (with a promax rotation) items from the pool with loadings greater than .6 were retained. A second factor analysis with this reduced set of items was then performed. Based on results from these initial factor analyses results, and considering the items for clarity and face validity a final item pool of 14 items was retained (i.e., four or five items retained for each of the three food-value orientation measures). Table 1.1 provides the final pool of 14 items.

Confirmatory factor analysis. CFA was performed using Amos 22 (Arbuckle 2006) to examine the items for each of the food-value orientations and the structure of the measurement model. As desired, the difference in χ^2 values between the three-factor model and the null model was significant ($p < .001$) (Fornell and Larcker 1981; Netemeyer, Bearden, and Sharma 2003). Although the χ^2 of the three-factor model was significant ($\chi^2(74) = 127.9; p < .01$), it was less than 2 times the number of degrees of freedom; this exceeds advocated levels (Bollen 1989). In addition, the fit indices for the measurement model indicate adequate fit: Comparative Fixed Index (CFI) = .98, Non-Normed Fit Index (NNFI) = .98, Root Mean Square Error of

Approximation (RMSEA) = .04, and Standardized Root Mean Square Residual (SRMR) = .04 (Hu and Bentler 1999).

Scale reliabilities. Coefficient alpha estimates of internal consistency for each food-value orientation ranged from .91 to .93. Further, Table 1.1 shows the standardized factor loadings, construct reliability, and variance extracted (VE) for each food-value orientation. The standardized loadings for each food-value orientation exceeded .70, and all t-values associated with the individual items for each food-value orientation were significant (all t's > 14.80, p 's < .001). The construct reliability estimates (Fornell and Larcker 1981) based on the standardized factor loadings all exceeded .90, indicating strong internal consistency among the items. Substantially exceeding Fornell and Larcker's (1981) recommendation of .50, the VE estimates ranged from .68 to .77.

Discriminant validity. Discriminant validity was assessed by comparing the square of the correlation between each pair of food-value orientations with the average variance extracted (AVE) from each pair of food-value orientations. Discriminant validity is supported when the AVE estimate exceeds the square of the correlation between the two measures (Fornell and Larcker 1981). This test provided support for discriminant validity; AVE estimates (all greater than .69) exceeded the square of correlation for each pair of food-value orientations (r 's ranged from $-.12$ to $.23$). Discriminant validity was further assessed using chi-square difference tests to compare the three-factor model to the possible two-factor models (Anderson and Gerbing 1988). Supporting discriminant validity, the differences in χ^2 values between the three-factor model and all possible two-factor models were significant ($p < .001$; Fornell and Larcker 1981). Finally, the correlations between each pair of food-value orientations plus or minus two standard errors did not include values of one.

Nomological validity. The relationships between the food-value orientation measures and other constructs and concepts were examined to provide support for nomological validity. Table 1.2 shows the correlations between the measures of the food-value orientations, as well as measures of nutrition knowledge, nutrition motivation, perceived health risk, demographics, and BMI (calculated based on the participant's reported height and weight). As shown in Table 1.2, the correlation between HVO and QVO was negative ($r = -.12; p < .05$), while the correlation between QVO and TVO was *positive* ($r = .23; p < .01$). There were negative correlations between income and QVO ($r = -.13; p < .05$), age and QVO ($r = -.12; p < .05$), and education level and QVO ($r = -.12; p < .05$). In addition, supporting nomological validity, there were positive relationships between HVO and both nutrition knowledge and nutrition motivation (r 's = .40 and .53; both p 's < .01), but *negative* relationships between HVO and both BMI and perceived health risk (r 's = $-.14$ and $-.23$; both p 's < .05). Although the positive correlations between HVO and both nutrition knowledge and motivation to process nutrition information support nomological validity, subsequent tests show support discriminant validity between the construct measures.

Furthermore, three independent samples t-tests with gender as the independent variable and each of the food-value orientations as dependent variables were conducted to examine potential gender differences. Males were significantly lower than females in HVO ($t(308) = 3.12, p < .01$). This difference aligns with findings from prior research indicating that females are more concerned about health (Beech and Whittaker 2001), more likely to comply with health recommendations (Keller and Lehmann 2008), and more concerned about the long-term health consequences associated their behaviors (Smith and Stutts 2003). In contrast, gender differences for both TVO and QVO were nonsignificant.

Discussion

Results from these initial tests were supportive of the scales' internal consistency, discriminant validity, and nomological validity. Further, relationships with demographics and BMI are intriguing. However, it is critical to validate results in data sets separate from those used to develop the scales (Netemeyer, Bearden, and Sharma 2003). Therefore, Study 2 will further evaluate the convergence of the items, scale reliabilities, discriminant validity, and nomological validity for the three food-value orientation measures.

Study 2

Method

Study 2 used a second national sample of 195 adults obtained from Amazon's MTurk to evaluate the scale items used to assess HVO, TVO, and QVO. The mean age of this second sample was 39.4, 57% (43%) were female (male), the median annual household income was \$40,000 to \$49,999, and 50% of the participants had obtained a four-year college degree. The demographic measures and measures of nutrition knowledge ($\alpha = .79$), nutrition motivation ($\alpha = .96$), and perceived health risk ($\alpha = .99$) were used again to further examine the nomological validity of the food-value orientation measures.

Results

Confirmatory factor analysis. To further evaluate the structure of the food-value orientation scales, confirmatory factor analysis was again conducted using Amos 22 (Arbuckle 2006). The χ^2 of the three-factor correlated model was significant ($\chi^2(74) = 138.50; p < .001$), the model χ^2 was again less than 2 times the degrees of freedom (Bollen 1989). In addition, the fit

indices for the CFA results indicated acceptable fit: CFI = .97, NNFI = .96, RMSEA = .06, and SRMR = .04 (Hu and Bentler 1999).

Scale reliabilities. Coefficient alpha estimates for each food-value orientation were high, ranging from .94 to .97. Table 1.1 shows the standardized factor loadings, construct reliability, and VE estimate for each food-value orientation. Like Study 1, the factor loadings for each food-value orientation exceeded .70, and all t -values associated with the individual items for each food-value orientation were significant (all t 's > 14.46, p 's < .001). The construct reliability estimates all exceeded .90, and the VE estimates ranged from .74 to .88 (Fornell and Larcker 1981).

Discriminant validity. The same tests of discriminant validity performed in Study 1 were again performed, and results strongly supported discriminant validity. Specifically, the differences in χ^2 values between the three-factor model and all possible two-factor models were significant ($p < .001$). Further, all AVE estimates for the food-value orientation pairs (all greater than .76) substantially exceeded the square of the correlation for each pair of food-value orientations (r 's ranged from $-.14$ to $.17$; Fornell and Larcker 1981). Again, the correlations between each pair of food-value orientations plus or minus two standard errors did not include the value of one.

Nomological validity. The correlations between the food-value orientations and other related measures shown in Table 1.3 were examined to assess nomological validity. As in Study 1, the correlation between HVO and QVO was negative ($r = -.14$; $p < .05$), while the correlation between QVO and TVO was positive ($r = .17$; $p < .05$). There was a negative correlation between consumers' education level and QVO ($r = -.18$; $p < .05$). As in Study 1, there was also a positive relationship between HVO and both nutrition knowledge and nutrition motivation (both

p 's < .01), but all tests again showed discriminant validity between HVO and these related constructs. There was a negative relationship between HVO and perceived health-risk ($r = -.17$; $p < .01$).

Independent samples t-tests were again used to examine potential gender differences across the three food-value orientation measures. Consistent with the previous study and aligning with previous literature (Beech and Whittaker 2001; Keller and Lehmann 2008; Smith and Stutts 2003), the results of these t-tests indicated that males were lower than females in HVO ($t(193) = 2.35$, $p < .05$); however, gender differences for both TVO and QVO were nonsignificant. As in Study 1, the TVO mean exceeds means for both HVO and QVO, consistent with the diagnostic role related to taste evaluations for most consumers.

Discussion

The findings from both Studies 1 and 2 largely converged to provide strong evidence of scale reliability, discriminant validity, and nomological validity for the food-value orientation measures. With consistent support for internal consistency and construct validity for these measures, Study 3 is a field study designed to examine expected group differences in the food-value orientation measures (Bearden, Hardesty, and Rose 2001; Lastovicka et al. 1999) and to initially examine the usefulness of the food-value orientation measures in predicting consumers' meal choices.

Study 3

Method

Procedure. Study 3 was a restaurant field study designed to initially assess the predictive validity and expected group differences validity of the food-value orientation measures. The relationships between the food-value orientation measures and participants' *expectations* about their specific chosen restaurant meals were examined. To examine expected group differences across consumers, this study also compared the food-value orientations for those categorized as normal weight, overweight, or obese based on their BMI. The survey was administered to restaurant patrons dining at a small table-service restaurant located in the South. Immediately after placing their order with the server, restaurant patrons were asked to participate in the study in exchange for a restaurant coupon that could be used on their next visit. If they agreed, they responded to a self-report survey assessing their expectations regarding their chosen meal and their food-value orientations using the measures established in Studies 1 and 2 (see Table 1.1). After responding to these measures, participants provided self-reported demographic information, including their height and weight used to calculate their BMI. Participants were informed in the instructions that all responses were completely confidential.

Measures. To assess participants' expectations about their specific chosen meal, three multi-item measures were used: (1) expected meal healthfulness, (2) expected taste, and (3) expected quantity. Healthfulness expectations of the specific meal ordered were measured using two seven-point items adapted from prior research ($r = .89$, $p < .001$; Kozup, Creyer, and Burton 2003): (1) "Overall, how would you rate the level of nutritiousness of the entire meal that you ordered?" with endpoints of "not nutritious at all/very nutritious" and (2) "I think the nutrition

level of the meal I ordered is:” with endpoints of “poor/good.” Taste expectations were measured using a seven-point scale item adapted from prior food labeling research: “I believe that the taste of this meal would be:” with endpoints of “very poor/excellent.” Quantity expectations were measured using two-seven point items ($r = .81, p < .001$): (1) “Based on your order, how much food would you expect to receive?” with endpoints of “a little/a lot” and (2) “When my meal is delivered, I would expect to receive a large quantity of food” with endpoints of “strongly disagree/strongly agree” (Berry et al. 2015). Because these attributes, especially taste and quantity, are considered experience attributes (Ford, Smith, and Swasy 1990), participants’ expectations were measured immediately after ordering but prior to receiving their chosen meal.

Food-value orientations were assessed with the measures used in the first two studies. Coefficient α s ranged from .90 to .95, indicating acceptable reliability.³ After responding to these measures, participants were asked to indicate their height and weight. These data were used to calculate participants’ BMI. Using BMI, participants were categorized as: (1) under or normal weight (BMI less than 25), (2) overweight (BMI greater than or equal to 25, but less than 30), or (3) obese (BMI greater than or equal to 30).

Sample. Of the restaurant patrons who visited the restaurant and were asked to participate in the study, there was a 64% response rate. The final sample consisted of 201 adult restaurant diners. All participants only visited the restaurant once during the period in which the study was conducted. The mean age of the participating restaurant diners was 37 years, and 43% (57%) of

³ Psychometric tests, including tests of factor structure and discriminant validity, were performed on the new food-value orientation measures assessed in Studies 3–5. As in Studies 1 and 2, all psychometric tests provided consistent support for the three enduring food-value orientation measures. These results are available upon request.

the participants were female (male). The median annual household income for the sample was \$60,000–\$69,999, and 51% of the sample had obtained a four-year college degree.

Results

Differences in food-value orientations across BMI categories. To assess the group differences in food-value orientations across BMI categories, a mixed-factorial ANOVA was used. BMI category was the between-subjects factor, and the three food-value orientations were the within-subjects factor. As expected, the BMI category by food-value orientations interaction was significant ($F(4, 396) = 3.92, p < .01$). Means for health-value, taste-value, and quantity-value orientation across the BMI categories are shown in Table 1.4. As shown in Table 1.4, participants in the normal weight category were more health-value oriented than individuals in the obese category; in contrast, participants in the normal weight category were less quantity-value oriented than participants in the obese category. As noted previously, taste-value is important to most consumers, and its mean does not differ between BMI groups.

Predictive validity. Enduring food-value orientations should help predict meal attribute expectations when consumers make purchasing decisions (i.e., consumers generally should order meals that they expect will align with their orientations). These relationships were examined to assess the predictive validity of the food-value orientation measures. As expected, HVO was positively associated with the *expected* healthfulness of meals chosen by participants ($r = .36, p < .001$), indicating that health-value oriented consumers choose meals that they expect to be healthful. Similarly, TVO was positively related to the *expected* taste of the specifically chosen meal ($r = .21, p < .01$), and QVO was positively related to the *expected* portion size of participants' chosen meal ($r = .23, p < .01$).

Discussion

The findings from this field study provide support for expected group differences and predictive validity for the food-value orientations. Consumers who are categorized as obese based on their BMI are more quantity-value oriented and less health-value oriented than consumers who are categorized as normal weight based on their BMI. These findings should be of interest to researchers interested in consumers' well-being and public health.

With consistent support for the reliability and validity of the food-value orientations measures across three studies, Study 4 will further examine the predictive validity of two of the food-value orientations by examining the moderating role of food-value orientations on consumers' response to food promotion and advertisements. Given the centrality of health and taste in determining food consumption behavior in prior research (Chandon and Wansink 2007; Dhar and Simonson 1999; Finkelstein and Fishbach 2010; Fishbach, Friedman, and Kruglanski 2003; Haws and Liu 2016; Liu et al. 2015), this study focuses on consumers' enduring health-value orientations and taste-value orientations. Specifically, Study 4a examines the moderating role of health-value orientation on the effect of a health message theme on consumers' purchase intentions, while Study 4b examines the moderating role of taste-value orientation on the effect of a taste message theme on consumer's purchase intentions.

Study 4

Pilot study

Prior to conducting Study 4a and Study 4b, a pilot study was conducted to assess the fit of two advertised message themes related to health and taste with the corresponding food-value

orientation conceptualized and empirically assessed in the prior study (i.e., health-value orientation and taste-value orientation). For example, the advertised message theme that was anticipated to be strongly linked to health stated: *“Wholesome Goodness. For those who care about their health.”* For taste, the advertisement theme stated: *“The gold standard of taste. You’ll agree it’s the best.”* Both advertisement themes were tested in the pilot study. For each message theme, the pilot study assessed how well the proposed theme was related to its corresponding food-value orientation (i.e., HVO and TVO). Two seven-point scale items measured the level of fit between the advertised messages and the two focal food-value orientations. Endpoints used were “not at all” and “very well” and “poor description” and “excellent description.” For both advertised message themes, the correlation between these items exceeded .80 (both p 's < .001). The measures were combined, and means were used in subsequent analyses. Participants were 46 senior-level undergraduate students.

To assess how well each of the advertised message themes related to its corresponding food-value orientation, two paired-sample t-tests were used. The results of these analyses indicated that both advertised message themes were most strongly related to their respective food-value orientation. Specifically, the theme of *“Wholesome Goodness. For those who care about their health.”* was more strongly related to HVO than TVO (p < .001), while the theme of *“The gold standard of taste. You’ll agree it’s the best.”* was more strongly related to TVO than HVO (p < .001).

Study 4a method

Design and procedure. Study 4a used a 2 condition (advertised message theme: health message theme vs. health message theme control) between-subjects design with HVO as a measured independent variable. Participants were randomly assigned to one of the two

experimental conditions (advertised message theme: health versus control). Participants first viewed an advertisement for a fictitious brand of a frozen dinner (i.e., Blue Ribbon) for a three cheese chicken penne product. Based on the results of the pilot study, in the health message theme condition, there was a tagline in the advertisement which stated: “*Wholesome goodness. For those who care about their health.*” However, in the control condition, this tagline was not presented in the advertisement (see Appendix 1.2). After viewing the advertisement, participants responded to measures of purchase intention, HVO, and demographic variables.

Sample. A national sample of 104 adult participants was obtained using Amazon’s MTurk. Participants mean age was 31.6, 50% (50%) of the sample were female (male), and 44% of the sample had received a four-year college degree. The sample had a median household income of \$40,000 to \$49,999.

Measures. Two sets of measures were used to measure HVO and purchase intention. HVO was measured using the four seven-point Likert scale items developed and assessed in the prior studies (e.g., “It is important to me to get healthy foods for the money I spend”; $\alpha = .94$). Purchase intention was measured using two seven-point scale items ($r = .94, p < .001$) drawn from prior nutrition labeling research (Kozup, Creyer, and Burton 2003). An example is: “Assuming you were interested in purchasing this type of food, how likely are you to buy this specific item given the information shown on the package?” with endpoints of “very unlikely/very likely.”

Study 4a results

HVO was expected to moderate the effect of the advertised health message theme on purchase intention. Specifically, for consumers high in HVO, the health message theme (versus the health message theme control) was expected to increase purchase intentions for the

advertised food product, while the health message theme (versus the health message theme control) was predicted to decrease purchase intentions for consumers low in HVO. To test this moderation, Model 1 in PROCESS with 10,000 bootstrap samples was used (Hayes 2013). Purchase intention was regressed on the advertised health message theme (health message theme = '1' and health message theme control = '0'), HVO, and the advertised health message theme by HVO interaction. To aid in interpretation, predictors were mean centered prior to creating the interaction term and conducting the analysis.

Supporting the predictive validity of HVO, the effect of the advertised health message theme by HVO interaction on purchase intention was significant ($b = .54$, $t(100) = 2.22$, $p < .05$), indicating that the slopes of the regression lines in the health message theme condition and message theme control condition were significantly different (Aiken and West 1991). Specifically, HVO had a positive influence on purchase intention when consumers viewed an advertisement with a health message theme ($b = .32$, $t(100) = 1.66$, $p < .05$). The opposite pattern of results was observed for consumers in the no message theme control condition; however, for this control condition, this simple slope did not reach significance ($b = -.23$, $t(100) = -1.48$, $p = .07$).

Figure 1.1 shows a plot of these interaction results. As shown in Figure 1.1, for consumers in the 90th percentile of HVO, the health messaged theme (versus the message theme control) had a positive effect on purchase intentions ($b = .75$, $t(100) = 1.53$, $p = .06$). However, for consumers in the 10th percentile of HVO, the health message theme (versus the message theme control) had a negative influence on purchase intentions ($b = -1.29$, $t(100) = -2.09$, $p < .05$). However, for consumers in between these two extremes of HVO, the effect of the health message was nonsignificant ($p > .05$).

Study 4b method

Design and procedure. Study 4b used a 2 condition (advertised message theme: taste message theme vs. taste message theme control) between-subjects design with TVO as a measured independent variable. Participants were randomly assigned to one of the two experimental conditions (advertised message theme: taste vs. control). Participants first viewed an advertisement for the same fictitious frozen food brand used in Study 4a. Based on the results of the pilot study, in the taste message theme condition, the tagline in the advertisement stated: “*The gold standard of taste. You’ll agree it’s the best.*” However, in the control condition, a tagline was not presented in the advertisement (see Appendix 1.3). After viewing the advertisement, participants responded to measures of purchase intention, TVO, and demographic variables.

Sample. A national sample of 109 adult participants was obtained using Amazon’s MTurk. Participants mean age was 31.1, and 54% (46%) were female (male). Forty-five percent of the sample had received a four-year college degree. The sample had a median household income of \$40,000–\$49,999.

Measures. Two sets of measures were used to measure TVO and purchase intention. TVO was measured using the five seven-point Likert scale items developed and assessed in the prior studies (e.g., “I often consider the taste of different foods to be sure that I get my money’s worth”; $\alpha = .92$). Purchase intention was measured using the same two seven-point scale items used in Study 4a ($r = .92, p < .001$).

Study 4b results

It was expected that TVO would moderate the effect of the advertised taste message theme on purchase intention. Specifically, for consumers high in TVO, the taste message theme

(versus the taste message theme control) was expected to increase purchase intentions for the advertised food product, while the taste message theme (versus the taste message theme control) was expected to decrease purchase intentions for consumers low in TVO. To test this moderation hypothesis, Model 1 in PROCESS with 10,000 bootstrap samples was used (Hayes 2013).

Similar to Study 4a, purchase intention was regressed on the advertised taste message theme (taste message theme = '1' and taste message theme control = '0'), TVO, and the advertised taste message theme by the TVO interaction. To aid in interpretation, predictors were mean centered prior to creating the interaction term and conducting the analysis.

Providing support for the predictive validity of TVO, the effect of the advertised message theme by TVO interaction on purchase intention was significant ($b = .76$, $t(105) = 2.36$, $p < .05$), indicating that the slopes in the taste message theme condition and message theme control condition were significantly different (Aiken and West 1991). Specifically, TVO had a negative influence on purchase intention when consumers viewed an advertisement without a message theme ($b = -.61$, $t(105) = -2.89$, $p < .01$). In contrast, the simple slope for the positive influence of TVO on purchase intention did not reach significance when the advertisement contained the taste message theme ($b = .15$, $t(105) = .62$, $p = .27$).

Figure 1.2 shows the plot of the interaction using percentiles of TVO (Hayes 2013). As shown in Figure 1.2, for consumers in the 90th percentile of TVO, the taste message theme (versus the message theme control) had a positive effect on purchase intentions ($b = .74$, $t(105) = 1.61$, $p = .05$). However, for consumers in the 10th percentile of TVO, the taste message theme (versus the message theme control) had a negative influence on purchase intentions ($b = -1.08$, $t(105) = -2.08$, $p < .05$). However, for consumers in between these two extremes of TVO, the effect of the taste message was nonsignificant ($p > .05$).

Discussion

Study 4 supports the predictive validity of HVO and TVO by demonstrating how these food-value orientations may moderate consumers' response to food promotion. Specifically, evidence was provided to demonstrate how HVO and TVO moderate the effect of advertised message themes on consumers' purchase intentions. Consumers that are not concerned with the healthfulness-value of products are less likely to purchase products that claim to be healthy, just as consumers that are not as concerned with the taste-value of products are less likely to purchase products that claim to be tasty.

It is worth noting that, based on the results of these two studies, the negative influence of the message themes on purchase intentions for consumers low on the corresponding food-value orientation appear to be stronger than the positive influence of the message themes on purchase intentions for consumers high on the corresponding food-value orientation. It is likely that this occurs because of the specific stimuli that were used. The pattern of results indicates that when no message claim is included in the advertisement consumers highly health- or taste-oriented have low purchase intentions relative to consumers who are less health- or taste-oriented. Thus, it could be that consumers oriented toward health-value or taste-value are unlikely to find a frozen food product healthful or tasty, respectively. Because of this, when a message theme is included that aligns with consumers' HVO or TVO, the positive effects of the theme on purchase intentions are not highly significant.

With strong, consistent support for the validity of these food-value orientation measures across four studies, these food-value orientations will be utilized to examine the predicted asymmetric effects of calorie information provision on calories ordered due to the moderating roles of these orientations. These predictions are tested in three experiments, including a

between-subjects experiment (Study 5), a pretest-posttest longitudinal experiment with a control group (Study 6), and an additional between-subjects field experiment conducted in a restaurant setting (Study 7).

Study 5

The goal of the next three studies is to assess the direct and moderating effects of consumers' food-value orientations on calories ordered, while also providing further evidence of the relationships between food-value orientations and consumers' expectations about their chosen meals when menu calorie labeling is manipulated. These studies utilize food-value orientations to understand consumers' food choices and the potential asymmetric effects of calorie information provision on calories ordered. Consistent with prior field and laboratory research, and given the critical policy objective to improve public health through more healthful consumption, calories ordered is the primary dependent measure of interest in these studies. More specifically, Study 5 will examine the direct and moderating effects of HVO on consumers' expectations about their specific chosen meals and meal calories ordered. Study 6 will examine the effects of HVO, TVO, and QVO on consumers' expectations about their specific chosen meals and calories ordered using a longitudinal experiment. Finally, Study 7 will bolster the external validity of Study 6 findings using a restaurant field experiment. Overall, the pattern of findings across these three experiments provides conceptual support for how consumers' enduring food-value orientations influence their choices from restaurant menus (H1–H3).

Method

Design and procedure. Study 5 was a 2 condition (no calorie information provision control versus calorie information provision) between-subjects online experiment. Participants were randomly assigned to one of the two conditions. All participants first viewed a menu from a fictitious restaurant and were asked to order from the menu as they would for their evening meal on an ordinary day. All menu items and the objective calorie information were obtained from actual chain restaurants (see Appendix 1.4). While viewing the menu, participants were asked to consider which entrée they would like to order for their meal. They also could order sides and a drink, if desired. In the calorie provision condition, calorie information was included on the menu (see Appendix 1.4). After recording their entrée, side(s), and drink choices, participants responded to measures of their expectations for their chosen meal.

Sample. A national sample of 103 adult participants was obtained using Amazon's MTurk. Participants' mean age was 37.5 (SD = 11.4), and 59% (41%) of the participants were female (male). The sample had a median household income of \$40,000–\$49,999, and 46% of the sample had obtained a four-year college degree.

Measures. The focal dependent measure was total meal calories ordered. This measure was the sum of the objective calories contained in the entrée, side(s), and drink ordered by the participant. The focal orientation examined in this experiment, HVO, was assessed using the four-item measure developed and used in the prior studies ($\alpha = .97$). In addition, after indicating their meal order, participants responded to measures of the expected healthfulness, taste, and quantity of their chosen meal with the same multi-item measures used in the previous study. The Pearson product-moment correlation coefficients between items in each of these two-item measures exceeded .91 (p 's < .001).

Results

Effects on consumers' expectations for their chosen meal. It is expected that consumers' HVO will be differentially related to the expected healthfulness, taste, and quantity of their chosen meal. In other words, consumers' HVO is predicted to be more positively related to expectations of meal healthfulness than expectations of meal taste or quantity. This prediction was used to further test the predictive and criterion validity of the food-value orientations and provide a conceptual foundation for the proposed direct and moderating effects of HVO on calories ordered. To test this predicted relationship, three regression models were estimated using Model 1 in PROCESS with 10,000 bootstrap samples (Hayes 2013). Specifically, each of the three meal expectations were regressed on HVO, calorie information provision (calories provided on the menu = '1' and calories not provided = '0'), and the calorie information provision by HVO interaction. The predictors, including calorie information provision,⁴ were centered at their means prior to creating the interaction term (Aiken and West 1991). As predicted, HVO was positively related to the expected healthfulness of the specific meal choice ($b = .36, t(99) = 3.85, p < .001$), but not to either taste ($b = .04, t(99) = .69, p > .40$) or quantity ($b = -.10, t(99) = -1.26, p > .20$) expectations. In tests of differences in regression coefficients, HVO was more strongly related to health expectations than to either taste or quantity expectations ($t(202)$'s ranged from 2.19 to 2.84, p 's $< .05$ for both).

Effects on calories ordered. It was predicted that consumers' HVO will be negatively related to calories ordered and that consumers' HVO will moderate the effect of calorie

⁴ As additional tests of predictive validity, a focal concern was the ability of food-value orientations to predict consumers' expectations about their chosen meals and calories ordered. Therefore, in Studies 4 and 5, the dummy coded calorie information provision predictor was centered at its mean so that the effects of the food-value orientations are the weighted average effects across the two experimental conditions (see Hayes 2013; p. 230).

information provision on calories ordered (H1–H2). Specifically, calorie provision should be more effective in reducing total meal calories ordered by health-value oriented consumers by providing additional objective information in an otherwise limited information environment. To test these predictions, Model 1 in PROCESS was again (Hayes 2013). Calories ordered was regressed on calorie information provision, HVO, and the calorie information provision by HVO interaction. Predictors were again mean centered prior to creating the interaction term.

Providing initial support for H1, HVO was negatively related to total meal calories ordered ($b = -60.49$, $t(99) = -2.02$, $p < .05$). In addition, consistent with prior experiments conducted outside of restaurant settings (Burton, Howlett, and Tangari 2009; Howlett et al. 2009; Parker and Lehmann 2014; Roberto et al. 2010), calorie information provision had a significant, negative effect on the number of meal calories ordered ($b = -281.03$, $t(99) = -3.19$, $p < .01$). However, these effects were qualified by a significant calorie information provision by HVO interaction ($b = -161.33$, $t(99) = -2.67$, $p < .01$). The effect of calorie information provision on total meal calories ordered was examined at five percentile levels of HVO (Hayes 2013). As shown in Figure 1.3, the effect of calorie information provision on calories ordered was significant when HVO was at or above the 50th percentile (50th percentile: $b = -309.49$, $t(99) = -3.47$, $p < .001$; 75th percentile: $b = -427.49$, $t(99) = -4.18$, $p < .001$; 90th percentile: $b = -588.82$, $t(99) = -4.12$, $p < .001$). However, the effect of calorie information provision on calories ordered was not significant when HVO was at relatively low levels (i.e., at 25th or 10th percentile; p 's $> .20$ for both). This interaction and pattern of results provides initial support for H2.

Discussion

These results provide further support for the effect of HVO on expectations of healthfulness, taste, and quantity associated with the meal chosen by consumers. The results also support the direct and moderating effects of HVO on total meal calories ordered (H1–H2). By providing consumers with additional objective information regarding the calorie content of meal items, calorie disclosure is effective in decreasing the number of calories ordered by health-value oriented consumers. In contrast to prior field studies (Long et al. 2015), these findings show that the information disclosure potentially has favorable effects for health-value oriented consumers. However, calorie information provision is not effective in influencing the number of meal calories ordered by consumers relatively low in their HVO. Those with low HVOs are not concerned about maximizing the healthfulness of their meal orders and are therefore not influenced by the provision of calorie information on restaurant menus.

Extending the findings of this study, Study 6 further tests this food-value conceptualization by simultaneously considering the influence of TVO and QVO on meal expectations and total meal calories ordered. Regarding the effects on meal calories ordered, Study 6 will examine the *positive*, aggregate influence of TVO, QVO, calorie information provision by TVO, and calorie information provision by QVO on the total number of meal calories ordered. These positive effects are predicted to offer a countervailing influence to calorie information provision, HVO, and the calorie information provision by HVO interaction (H3). These countervailing influences explain the plethora of nonsignificant findings regarding effects of calorie information provision on total meal calories ordered found in previous literature (see Appendix 1.3).

Study 6

Method

Design and procedure. A longitudinal pretest-posttest experimental design with a control group was used to examine the proposed effects on consumers' expectations about their chosen meal and calories ordered from a restaurant menu. This longitudinal design mimics the change that will occur in the marketplace when calorie information provision on restaurant menus and menu boards becomes mandatory in May 2018 (FDA 2017). Further, this design has been used by many previous studies that examined the implementation of menu calorie labeling in New York City and King County, Washington (see Appendix 1.1). At Time 1 (T1), participants ordered from a fictitious menu with no calorie information (see Appendix 1.4) and responded to the measures of food-value orientations and demographics. One month later, at Time 2 (T2), the same participants again ordered from the same fictitious menu. However, at T2, the participants were randomly assigned to a menu with or without calorie information. To increase realism, all menu items and calorie levels were obtained from major table-service chain restaurants. At both T1 and T2, participants were asked to order from the menu as they would for their evening meal on an ordinary day, including an entrée and, if desired, side(s) and a drink. The primary dependent variable was the number of calories ordered at T2. In addition, after participants had indicated their meal choices, healthfulness, taste, and quantity expectations about their chosen meals were also measured at both T1 and T2 to provide further support for the predictive validity of the food-value orientation measures.

Sample. The national sample consisted of 271 adult participants obtained using Amazon's MTurk. The mean age of participants was 39.3. Fifty-eight percent (forty-two percent) of the

participants were female (male). The sample had a median household income of \$40,000–\$49,999, and 48% had received a four-year college degree.

Measures. After participants indicated their meal order at T1, they responded to measures of food-value orientations and demographics. HVO ($\alpha = .96$), TVO ($\alpha = .94$), and QVO ($\alpha = .95$) using the items established in Studies 1 and 2. The focal dependent measure of meal calories ordered at T2 was the sum of the objective calories contained in the entrée, side(s), and drink ordered. Meal calories were also calculated for participants' orders at T1, and this measure was used as a control variable in the analyses to account for meal preferences when calorie information was not present. In addition, after indicating their meal order at T2, participants responded to measures of the expected healthfulness, taste, and quantity of their chosen meal with the same multi-item measures used in Studies 3–5. The Pearson product-moment correlation coefficients between items in each of these multi-item measures exceeded .83 (p 's < .001).

Results

Effects on consumers' expectations for their chosen meal. It is expected that consumers' HVO, TVO, and QVO will be differentially related to the expected healthfulness, taste, and quantity of their chosen meal. This prediction was used to further test the predictive and criterion validity of the food-value orientations and provide a conceptual foundation for the proposed direct and moderating effects of the food-value orientations on calories ordered. To test these predicted relationships, three regression models were estimated. Specifically, each of the three meal expectations were regressed on HVO, TVO, QVO, calorie information provision (calories provided on the menu = '1' and calories not provided = '0'), and the three calorie information provision by food-value orientation (i.e., HVO, TVO, and QVO) interactions. The predictors,

including calorie information provision,⁵ were centered at their means prior to creating these three interaction terms (Aiken and West 1991). As predicted, HVO was positively related to the expected healthfulness of the specific meal choice ($b = .34$, $t(263) = 6.40$, $p < .001$); in tests of differences in coefficients, HVO was more strongly related to health expectations than to either taste or quantity expectations ($t(538)$'s ranged from 4.49 to 5.00, p 's $< .001$). Similarly, QVO was positively related to the amount of food participants' expected to receive for their chosen meal ($b = .26$, $t(267) = 6.22$, $p < .001$), and QVO was more strongly related to quantity expectations than to either health or taste expectations ($t(538)$'s ranged from 2.27 to 3.17, p 's $< .05$). Lastly, TVO was positively related to expectations about the taste of the selected meal ($b = .19$, $t(263) = 3.79$, $p < .001$); TVO was more positively related to taste expectations than to health expectations ($t(538) = 2.19$, $p < .05$). Although TVO also was more positively related to taste expectations than quantity expectations, this difference was nonsignificant ($p > .20$). These results again support nomological validity. In all three regression models, the food-value orientations by calorie information provision interactions were nonsignificant, supporting the idea that consumers choose specific meals that they expect will align with their food-value orientations.

Effects on calories ordered. Hierarchical multiple regression was used to estimate three models. These results are shown in Table 1.5. In Model 1, calories ordered at T2 was regressed on calories ordered at T1 (a control which accounts for general meal preferences) and demographic controls (i.e., age, gender, income, and education). As shown in Table 1.5, these

⁵ As additional tests of predictive validity, a focal concern was the ability of food-value orientations to predict consumers' expectations about their chosen meals and calories ordered. Therefore, in Studies 4 and 5, the dummy coded calorie information provision predictor was centered at its mean so that the effects of the food-value orientations are the weighted average effects across the two experimental conditions (see Hayes 2013; p. 230).

controls explain a significant amount of the variance in calories ordered. In Model 2, the predictors expected to *decrease* calories ordered were hierarchically added to the regression model; these predictors included calorie information provision, HVO, and the calorie information provision by HVO interaction. As shown in Model 2 of Table 1.5 and providing further support for H1, HVO was *negatively* related to calories ordered. In addition, the addition of these predictors resulted in a significant increase in R^2 . To examine the countervailing effects of food-value orientations unrelated to health-value, the predictors expected to *increase* calories ordered were hierarchically added in Model 3; these included TVO, QVO, calorie information provision by TVO, and calorie information provision by QVO. As shown in Model 3 of Table 1.5, the inclusion of TVO, QVO and their interactions with calorie information provision led to a significant increase in R^2 . Providing addition support for H1, both TVO and QVO were *positively* related to calories ordered.

In addition, consistent with other studies not conducted in restaurant settings (Burton, Howlett, and Tangari 2009; Howlett et al. 2009; Parker and Lehmann 2014; Roberto et al. 2010), calorie information provision decreased calories ordered ($p < .001$). However, the direct effects of calorie information provision and HVO were qualified by the calorie information provision by HVO interaction. To examine the moderating role of HVO on the effect of calorie information provision on calories ordered, the effect of calorie information on total meal calories ordered was tested at five percentile levels of HVO using model 1 of PROCESS (Hayes 2013). As shown in Figure 1.4, the effect of calorie information provision on calories ordered became significant when HVO reached the 50th percentile (50th percentile: $b = -179.29$, $t = -3.45$, $p < .001$), and the effect of the information strengthened as HVO increased (75th percentile: $b = -245.95$, $t = -3.81$, $p < .001$; 90th percentile: $b = -312.70$, $t = -3.47$, $p < .001$). However, the effect of calorie

information provision on calories ordered was *not* significant when HVO was at the 25th percentile or below ($p > .05$). This pattern of results provides further support for H3 and demonstrates that calorie information provision will only reduce calories ordered among health-value oriented consumers.

A primary concern in this study was the potential countervailing influence of consumers' TVO, QVO, and each of their interactions with calorie information provision on calories ordered. Specifically, H3 predicted that the aggregated effects of calorie information, consumers' HVO, and the calorie information provision by HVO interaction will *decrease* total meal calories ordered (H3a), while the aggregated effects of consumers' TVO, QVO, and the interaction of each of these orientations with calorie information provision will *increase* meal calories ordered (H3b). When these positive and negative effects are considered in combination, there should be no influence of calorie information provision, food-value orientations, and the calorie information provision by food-value orientation interactions on meal calories ordered (H3c). To test these predictions, three joint hypothesis tests were performed using Stata.

Providing support for H3a, calorie information provision, HVO, and the calorie information provision by HVO interaction had a *negative* joint effect on calories ordered ($F(1, 258) = 15.57, p < .001$). As indicated by the regression coefficients, the combination of these effects resulted in a total reduction of 259 calories ordered. In contrast and supporting H3b, TVO, QVO, and the interaction of each of these orientations with calorie information provision had a *positive* joint effect on calories ordered ($F(1, 258) = 4.84, p < .05$). These effects resulted in a total increase of 112 calories ordered. In aggregate, the joint effect of calorie information provision, HVO, TVO, QVO, and the calorie information provision by food-value orientation interactions on calories ordered was nonsignificant ($F(1, 258) = 2.64, p > .10$). These results

provide initial support for the counterbalancing effects due to the direct and moderating roles of consumers' food-value orientations proposed in H3. As noted in Table 1.5, the addition of the food-value orientations, calorie provision, and the value by calorie provision interactions almost double the variance explained by the initial control model (R^2 increase = .12; $p < .01$).

Discussion

Study 6 provides further support that consumers order meals they expect will align with their enduring food-value orientations and provides a conceptualization to partially explain why consumers order the meals they do. In addition, this longitudinal experiment mimics the marketplace change that will occur when calories become mandatory on restaurant menus, and it provides support for H1 and H2 pertaining to the direct and moderating effects of HVO on (decreasing) calories ordered. In contrast, consumers oriented toward taste-value or quantity-value order meals that they expect to be tasty and large (and contain more calories), providing additional support for H1.

While providing consumers with additional information regarding calorie content, the information is effective in decreasing the number of calories ordered by high HVO consumers, it does not influence meal calories ordered by consumers lower in HVO. Further, TVO, QVO, and their interactions with calorie information provision, in aggregate, result in an (unintended) increase in calories ordered, offering a countervailing influence to the (intended) decreases in calories ordered attributable to calorie information provision, HVO, and the calorie information provision by HVO interaction. Study 7 extends Study 6 results by using consumers' food-value orientations to provide further insight into consumer response to calorie information provision on menus and menu boards in a restaurant field setting.

Study 7

Method

Design and procedure. In a final field experiment, the measures developed for consumers' food-value orientations were utilized to examine the proposed countervailing influences that calorie information provision can have across restaurant patrons and seek to provide insight into why most prior field studies have failed to find an effect of this intervention (see Appendix 1.1). This field study was a between-subjects experiment (no calorie information provision vs. calorie information provision) conducted in a restaurant to again examine the effects of calorie labeling and food-value orientations on calories ordered (H1–H3). This study was conducted for six consecutive days at a fast-casual restaurant located in the Southeast. Throughout the week, objective calorie information was either disclosed or not disclosed on the menu and menu boards on a rotating daily basis (see Appendix 1.5). Upon placing their order, participants immediately were asked if they would like to participate in the study in exchange for a restaurant coupon that could be used on their next visit. If they agreed, participants' meal order was recorded, and then participants responded to measures of food-value orientations and demographics.

Measures. Food-value orientations were assessed with the measures used in the previous six studies. Coefficient α s again all exceeded .90 for the food-value orientation measures. As in the past two experiments (Studies 5–6), the focal dependent measure in this field experiment was the total number of overall calories contained in the entrée, side(s), and drink(s) ordered by the participant.

Sample. Among restaurant patrons who visited the restaurant while the study was being conducted, there was a 65% response rate. This resulted in a final sample of 279 adult diners. All participants only visited the restaurant once during the test period. The mean age of the participating restaurant diners was 47.4, and 67% (33%) of the participants were female (male). The median annual household income for the sample was \$80,000–\$89,999, and 56% of the sample had obtained a four-year college degree. Demographics were included as controls in tests of effects on calories ordered.

Results

Hierarchical multiple regression was used to examine the effects of menu calorie labeling and food-value orientations on calories ordered. After mean centering the predictors (Aiken and West 1991), including the dummy coded calorie information provision (calories provided on the menu = ‘1’ and no calories on the menu = ‘0’), three interaction terms were created using the product of calorie information provision and each of the three food-value orientations. Three regression models were estimated, and these results are shown in Table 1.6. Model 1 regressed demographic controls on meal calories ordered. Age was negatively related to calories ordered, and males ordered significantly more calories than females. In Model 2, the predictors expected to *decrease* calories ordered were added to the regression model; these predictors included calorie information provision, HVO, and calorie information provision by HVO. As demonstrated by the significant change in R^2 , the addition of these predictors improved the prediction of calories ordered compared to the model with demographic controls only. Supporting the conceptual framework and providing additional support for H2a, HVO was *negatively* related to calories ordered. The predictors expected to *increase* calories ordered were added to the regression in Model 3; these included TVO, QVO, and the calorie information

provision by taste-value and quantity-value orientation interactions. As expected, these pooled coefficients are positive, and the inclusion of these four predictors resulted in a significant change in R^2 . Providing support for H2c, QVO *increased* calories ordered; however, in this field study, the influence of TVO on calories ordered did not reach significance.

Note that consistent with prior field studies (see Appendix 1.1), menu calorie labeling *alone* did not influence the number of calories ordered. This result demonstrates the importance of considering consumers' food-value orientations when evaluating the effect of menu calorie labeling. Specifically, supporting H2, Model 3 shows that the calorie information provision by HVO interaction on calories ordered again was significant, indicating that calorie information provision was only effective in decreasing the number of calories ordered when HVO was high and that the negative influence of HVO on calories ordered was strengthened by calorie information provision. As in Studies 5 and 6, the effect of calorie labeling on total meal calories ordered was tested at five percentile levels of HVO to examine the moderating role of HVO on the effect of calorie information provision on calories ordered (Hayes 2013). As shown in Figure 1.5, the effect of calorie information provision on calories ordered was *negative* and significant when HVO was at or above the 90th percentile ($b = -135.51$, $t(271) = -1.99$, $p < .05$). However, note that while the slopes were *negative* for those at the 50th and 75th percentiles and *positive* for the 25th and 10th percentiles, the effects of calorie information provision on calories ordered did not reach significance when HVO was at or below the 75th percentile (p 's $> .05$). These interaction results provide further support for the moderating role of HVO on the effect of calorie information provision on calories ordered (H2).

Joint hypothesis tests were again performed using Stata to assess the aggregate effects of calorie information provision, food-value orientations, and the interactions of calorie information

provision with each of the food-value orientations proposed in H3. While calorie information provision *alone* did not affect calories ordered, results show that HVO, calorie information provision, and the calorie information provision by HVO interaction had a *negative* joint effect on calories ordered ($F(1, 271) = 8.03, p < .01$). This result provides further support for H3a. In contrast and supporting H3b, TVO, QVO, and the interaction of each of these orientations with calorie information provision had a *positive* joint effect on calories ordered ($F(1, 271) = 3.78, p < .05$). The significant ($p < .05$) 109 calorie *increase* associated with these orientations and interactions appear to counterbalance the significant ($p < .05$) *decrease* of 157 in meal calories ordered associated with calorie information provision, HVO, and the calorie information provision by HVO interaction. Therefore, supporting H3c, the joint effect of HVO, TVO, QVO, and the food-value orientation by calorie information provision interactions on calories ordered had a minimal effect on total calories ordered and was not significantly different from zero ($F(1, 271) = 0.40, p > .50$).

Discussion

This between-subjects field experiment extends the results of the longitudinal experiment (Study 6) by testing the counterbalancing effects due to the direct and moderating roles of consumers' food-value orientations in a restaurant field setting (H1–H3). The results of this field experiment provide further support for H1 for the *negative* relationship between HVO and calories ordered and the *positive* relationship between QVO and calories ordered. Additional support was also found for the moderating effect of HVO on total meal calories ordered, such that menu calorie information provision only leads to decreases in the number of calories ordered by consumers who are highly health-value oriented. Conclusions and implications of these findings are discussed below.

General Discussion

Given the prevalence of obesity and changes to the information environment aimed at reducing these high obesity rates, understanding consumers' food consumption behaviors is an important issue for consumer well-being, public policy, and consumer researchers. To provide insight into this important issue, measures were developed and a conceptualization that the perceived value associated with food products drives consumers' food consumption behaviors and moderates the effects of nutrition information provision was tested. In four initial studies, psychometrically valid scales for three food-value orientations were initially developed, and these measures were used in three additional studies to evaluate the success (or failure) of information disclosures aimed at reducing the prevalence of obesity. In contrast to most prevailing marketplace assessments (see Long et al. 2015 for a review), these measures were used to demonstrate the critical role played by consumers' food-value orientations that result in asymmetric, countervailing responses to the provision of calorie information on restaurant menus and menu boards.

Overview of the findings

Based on the conceptualization of food-value orientations offered here, psychometrically sound and valid measures of consumers' food-value orientation measures were developed and tested in Studies 1–4. Studies 1 and 2 provided initial evidence regarding the dimensionality, convergence of items, discriminant validity, and nomological validity of these enduring orientations. Study 3, a restaurant field study, then provided additional evidence for predictive validity and expected group differences. Study 4 provided further support for the predictive validity of the measures in a food promotion context. After these measures were developed and

extensively tested in Studies 1–4, three experiments were conducted as application studies to test hypotheses and demonstrate how these newly developed measures can be used to provide a conceptual and empirical understanding of the asymmetric effects of calorie information provision on calories ordered, an outcome with critical implications for consumer health and well-being.

Specifically, Studies 5 and 6 illustrated how calorie information provision may decrease calories ordered by health-value oriented consumers; however, using a longitudinal framework to mimic the major marketplace change that will occur in 2018 (FDA 2017), Study 6 showed that calorie information provision may increase calories ordered by consumers with stronger taste-value or quantity-value orientations. Extending these results to a restaurant setting, Study 7 shows that differences across HVO, TVO, and QVO lead to different ways in which objective information affects choice outcomes. Since consumers use calorie information in different ways, the net effect on calories ordered may be negligible (cf. Long et al. 2015). Consistent with these prior studies, menu calorie labeling in isolation did not significantly decrease calories ordered across all consumers in this restaurant setting; however, findings demonstrate that calorie information provision has its intended effects for high HVO consumers. Yet, for high TVO and QVO levels, calorie information provision appears to increase calories ordered. When these countervailing influences are considered in combination, they counterbalance the effects of one another, leading to an overall nonsignificant direct effect of calorie information provision on calories ordered as part of restaurant meals.

Conceptual contributions

This research offers a new conceptual framework to better understand consumers' food consumption decisions and responses to nutrition information provision. Specifically, this

research provides a more thorough understanding of enduring, individual-level factors that have direct and moderating influences on food choice and calories ordered. Findings from Studies 3–6 confirm that consumers tend to order meals and purchase packaged foods that they expect will align with their food-value orientations. While objective nutrition information (e.g., calorie labeling) may lead to shifts in consumers’ food choices because consumers can make more informed choices, consumers generally strive to align their choices with their food-value orientations regardless of whether they are provided with nutrition information.

In general, understanding how consumers’ enduring food-value orientations interact with information disclosures seems critical. Given the perceived negative relationship between meal healthfulness and both taste and quantity (Raghunathan, Naylor, and Hoyer 2006; Suher, Raghunathan, and Hoyer 2016), the overall inferential process occurring when exposed to objective information seems particularly important. In Studies 5–7, this resulted in favorable outcomes for those high in HVO, and unintended, unfavorable outcomes (Stewart and Martin 1994; 2004) for consumers with other food-value orientations (see Studies 6–7). Although prior research has identified some consumer predispositions, such as consumer motivation and knowledge, that may moderate the effects of nutrition information on important outcomes (e.g., more healthful choices; Howlett et al. 2009), use of the multi-item measures developed here shows that other consumer predispositions and their interactions with information disclosures result in consumers ordering *more* calories. This extends prior conceptualizations and findings that have failed to show such increases that explain a counterbalancing effect in the marketplace. Specifically, by considering consumers’ distinct food-value orientations, which can have both positive and negative direct and moderating effects on calories ordered, these findings provide a theoretical explanation for the plethora of nonsignificant results regarding the effects of menu

labeling in studies conducted in restaurant settings. Beyond providing an understanding of the intended and unintended consequences menu calorie labeling, the scales used to assess consumers' food-value orientations may also be utilized to examine consumer responses to other forms of information communication, including specific forms of promotion and other nutrition disclosures.

Implications for consumer well-being and public policy

Although the primary focus of this research has been on the moderating influence of food-value orientations, the direct effects also should be of interest for the consumer health and public policy communities. Findings show that health-value oriented consumers tend to order fewer calories from restaurant menus as part of their meal, whereas quantity- and taste-value oriented consumers tend to order more calories from restaurant menus. Based the results from these studies, this appears to be because health-value oriented consumers strive to order more healthful meals, which tend to have fewer calories. In contrast, quantity-value oriented consumers attempt to order larger meals and taste-value oriented consumers attempt to order tasty meals; these meals are more likely to contain a greater number of calories. Given that menu calorie labeling will soon be required nationwide, this reinforces the importance of primary consumer orientations, and it suggests possibilities for PSA's and informational 'nudges' that might be helpful when the labeling is introduced in the marketplace.

Considering the extant literature and arguments in the popular press regarding calorie labeling, from a public policy and consumer well-being perspective, the asymmetric effects of calorie information provision across food-value orientations offers some favorable and unfavorable news. Policy makers and health advocates hope consumers will use calorie information to choose more healthful, lower calorie foods, which could help reduce obesity in

the long run. While these desired effects occur for consumers high in HVO, consumers high in TVO and QVO will often use calorie information to identify food items that best align with their food-value orientations, resulting in a greater number of calories ordered.

Specifically, Studies 5–7 offer a compelling explanation for the failure of many studies to find an effect of calorie labeling on total meal calories ordered in restaurant settings. For example, Study 7 results show that calorie information provision significantly reduces the meal calories ordered by an average of 140 calories among highly health-value oriented consumers (i.e., those in the 90th percentile on HVO). Consequently, mandatory calorie labeling may benefit this consumer segment. These results are what policy makers desire from information provision mandates; that is, it will “assist consumers in maintaining healthy dietary practices” (NLEA 1990). Conversely, the results of Study 7 show that TVO, QVO, and their interactions with calorie information provision increase calories ordered by 109 calories. Given the inferential process involving healthfulness and its negative relationships to taste and quantity, calorie information is used by many consumers to enhance food value in ways that diverge from healthy choices. This is an outcome generally not foreseen by many consumer researchers, consumer health advocates, and policy makers. This is an important point for these communities—policy makers can mandate that information be provided, but they cannot control how consumers *choose to utilize* the information when making product choices.

Managerial implications

Beyond the implications that these findings have for the public health and policy communities, these findings have clear implications for food marketers and restaurant managers. With restaurant food sales exceeding \$800 billion annually, effects of these changes in the information environment will be closely scrutinized by managers and marketers in the restaurant

industry. The findings across these studies suggest that the more homogenous a restaurant's customer base is in terms of their food-value orientations, the more predictable and manageable the effects nutrition information provision are likely to be. For example, for a delicatessen chain positioned as healthy, if the majority of its customers are health-value oriented, management might expect calorie labeling to lead to lower calorie item choices and a shift away from items with higher than expected calorie levels (e.g., Howlett et al. 2009). On the other hand, if an all-you-can-eat buffet chain has many quantity-value oriented patrons who are less concerned about the health-value of their food choices, managers might anticipate greater consumption of dense, higher calorie foods. Understanding these expected shifts in demand can help managers create more accurate and efficient assortment plans.

Furthermore, for restaurant chains who cater to diverse segments and have developed offerings consistent with differing food-value orientations, the fact that consumers can tailor the use of calorie information to their own needs seems to bode well for these firms. That is, our results suggest that by providing calorie information, needs may be better satisfied even across consumers who vary in their food-value orientations. From a consumer perspective, the provision of calorie information is beneficial by helping them increase the utility derived from their choices, regardless of whether that value is derived from the healthfulness, taste, or quantity delivered. Because restaurants can offer a range of products that differ in these diagnostic attributes (e.g., items can be grouped as healthful options versus items grouped as large, hearty meals), promotion and presentation of menus can be positioned in a manner that appeals to differing orientations and simplifies the processing of the many choice options available at table-service restaurants (Parker and Lehmann 2014). Restaurants that position themselves as 'healthy' restaurant chains may want to ensure that their product line does not diverge too substantially

from this health orientation (i.e., 1000+ calorie salads that HVO consumers had assumed were low in calories), since this may lead to negative reactions among previously loyal, health-value oriented patrons.

Importantly, Study 4 findings have clear implications for food marketers designing promotion, advertising, or packaging targeting various consumer segments. These findings demonstrate that consumers' food-value orientations moderate consumer response to food promotion. Therefore, food marketers should consider the food-value orientation of their target market before developing food promotion and packaging. Specifically, food promotion and packaging should align with consumers' food-value orientations for the promotion to have a potentially positive influence on product evaluations and purchase intentions. If the food promotion does not align with the target market's food-value orientations, findings suggest that the promotion can actually "backfire" and have a negative influence on consumers' intent to purchase the promoted product.

Limitations and future research

This research has developed measures and focused on the direct and moderating role of consumers' enduring food-value orientations rather than the many environmental and contextual influences on consumer choices (see Wansink and Chandon 2014 for a comprehensive overview). The interactions between food-value orientations and environmental and contextual influences offer important opportunities for additional research. For example, how do "nudges" promoting more healthful choices offered at the point-of-purchase differentially affect consumers based on their food-value orientations? When calorie information is provided, can nudges improve the healthfulness of choices made by taste-value and quantity-value oriented consumers? Are there nudges that can further improve choices for health-value oriented

consumers who are already attempting to make healthful choices? Clearly, consumers do not always make choices consistent with their food-value orientations, so a further understanding of these more complex interactions in the new information environment is a fruitful direction for future studies.

Though not a focus of the research presented in this essay, it seems plausible that the newly developed, psychometrically sound measures of food-value orientations could interact with restaurant positioning, different promotional efforts, and disclosures on consumer packaged goods to affect brand preferences and purchase behaviors. The findings from these studies can be used to guide related future research efforts on the effects of various value appeals appearing on packages and in advertising that may be influential to different segments depending on their food-value orientations (e.g., “Improved Taste!”, “Healthy!”, “Get 6 oz. Free!”). In addition, are there asymmetric differences in how changes in prices affect demand for differing *types* of restaurant meals (e.g., more healthful versus very large quantity) across these food-value orientation segments? The combined effects of claims, front-of-package calorie and nutrient disclosures, and food-value orientations is an important area for future research. Findings could be used to guide CPG manufacturers’ package design and branding decisions, food retailers’ assortments and in-store marketing decisions, as well as having implications for consumer health and well-being.

References

- Aiken, Leona S., and Stephen G. West (1991), *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage Publications, Inc.
- Anderson, James C. and David W. Gerbing (1988), "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach," *Psychological Bulletin*, 103 (3), 411–423.
- Anderson, John R. (1983), *The Architecture of Cognition*. Cambridge, MA: Harvard University Press.
- Andrews, J. Craig, Richard G. Netemeyer, and Scot Burton (1998), "Consumer Generalization of Nutrient Content Claims in Advertising," *Journal of Marketing*, 62 (4), 62–75.
- Arbuckle, J. L. (2006), Amos (Version 7.0) [Computer Program]. Chicago: SPSS.
- Bagchi, Rajesh and Lauren Block (2011), "Chocolate Cake Please! Why Do We Indulge More When it Feels More Expensive?" *Journal of Public Policy and Marketing*, 30 (2), 292–304.
- Bearden, William O., David M. Hardesty, and Randall L. Rose (2001), "Consumer Self-Confidence: Refinements in Conceptualization and Measurement," *Journal of Consumer Research*, 28 (1), 121–134.
- Beech, John R. and James Whittaker (2001), "What is the Female Image Projected by Smoking?" *Psychologia*, 44 (3), 230–236.
- Berry, Christopher, Amaradri Mukherjee, Scot Burton, and Elizabeth Howlett (2015), "A COOL Effect: The Direct and Indirect Impact of Country-of-Origin Disclosures on Purchase Intentions for Retail Food Products," *Journal of Retailing*, 91 (3), 410–421.
- Bollen, Kenneth A. (1989), *Structural Equations with Latent Variables*. New York: Wiley.
- Bollinger, Bryan, Phillip Leslie, and Alan Sorensen (2011), "Calorie Posting in Chain Restaurants," *American Economic Journal: Economic Policy*, 3 (1), 91–128.
- Briers, Barbara, and Sandra Laporte (2013), "A Wallet Full of Calories: The Effect of Financial Dissatisfaction on the Desire for Food Energy," *Journal of Marketing Research*, 50 (6), 767–781.
- Broniarczyk, Susan M. and Joseph W. Alba (1994), "The Importance of the Brand in Brand Extension," *Journal of Marketing Research*, 31 (2), 214–228.
- Bublitz, Melissa G., Laura A. Peracchio and Lauren G. Block (2010), "Why Did I Eat That? Perspectives on Food Decision Making and Dietary Restraint," *Journal of Consumer Psychology*, 20, 239–258.

- Burton, Scot and Jeremy Kees (2012), “Flies in the Ointment? Addressing Potential Impediments to Population-Based Health Benefits of Restaurant Menu Labeling Initiatives,” *Journal of Public Policy & Marketing*, 31 (2), 232–239.
- Burton, Scot, Elizabeth H. Creyer, Jeremy Kees, and Kyle Huggins (2006), “Attacking the Obesity Epidemic: The Potential Health Benefits of Providing Nutrition Information in Restaurants,” *American Journal of Public Health*, 96 (9), 1669–1675.
- Burton, Scot, Elizabeth Howlett, and Andrea Heintz Tangari (2009), “Food for Thought: How Will the Nutrition Labeling of Quick Service Restaurant Menu Items Influence Consumers’ Product Evaluations, Purchase Intentions, and Choices?,” *Journal of Retailing*, 85 (3), 258–273.
- Burton, Scot, Judith A. Garretson, and Anne M. Velliquette (1999), “Implications of Accurate Usage of Nutrition Facts Panel Information for Food Product Evaluations and Purchase Intentions,” *Journal of the Academy of Marketing Science*, 27 (4), 470–480.
- Centers for Disease Control and Prevention (CDC) (2017), “Nutrition, Physical Activity and Obesity: Data, Trends and Maps,” (accessed March 26, 2017), [available at https://nccd.cdc.gov/NPAO_DTM/IndicatorSummary.aspx?category=28&indicator=29&year=2014&yearId=18].
- Chandon, Pierre and Brian Wansink (2007), “The Biasing Health Halos of Fast-Food Restaurant Health Claims: Lower Calorie Estimates and Higher Side Dish Consumption Intentions,” *Journal of Consumer Research*, 34 (3), 301–314.
- Connors, Margaret, Carole A. Bisogni, Jeffery Sobal, and Carol M. Devine (2001), “Managing Values in Personal Food Systems,” *Appetite*, 36 (3), 189–200.
- Dhar, Ravi and Itamar Simonson (1999), “Making Complementary Choices in Consumption Episodes: Highlighting Versus Balancing,” *Journal of Marketing Research*, 36 (1), 29–44.
- Dodds, William B., Kent B. Monroe, and Dhruv Grewal (1991), “Effects of Price, Brand, and Store Information on Buyers’ Product Evaluations,” *Journal of Marketing Research*, 28 (3), 307–319.
- Downs, Julie S., Jessica Wisdom, Brian Wansink, and George Loewenstein (2013), “Supplementing Menu Labeling with Calorie Recommendations to Test for Facilitation Effects,” *American Journal of Public Health*, 103 (9), 1604–1609.
- Dumanovsky, Tamara, Christina Y. Huang, Cathy A. Nonas, Thomas D. Matte, Mary T. Bassett, and Lynn D. Silver (2011), “Changes in Energy Content of Lunchtime Purchases from Fast Food Restaurants after Introduction of Calorie Labelling: Cross Sectional Customer Surveys,” *BMJ: British Medical Journal*, 343, d4464.
- Economic Research Service (ERS), United States Department of Agriculture (USDA) (2017), “Food Availability (Per Capita) Data System,” (accessed February 6, 2017), [available at

[http://www.ers.usda.gov/data-products/food-availability-\(per-capita\)-data-system/summary-findings.aspx](http://www.ers.usda.gov/data-products/food-availability-(per-capita)-data-system/summary-findings.aspx)].

- Elbel, Brian, Joyce Gyamfi, and Rogan Kersh (2011), “Child and Adolescent Fast Food Choice and the Influence of Calorie Labeling: A Natural Experiment,” *International Journal of Obesity*, 35 (4), 493–500.
- Elbel, Brian, Rogan Kersh, Victoria L. Brescoll, and L. Beth Dixon (2009), “Calorie Labeling and Food Choices: A First Look at the Effects on Low-Income People in New York City,” *Health Affairs*, 28 (6), 1110–1121.
- Ellison, Brenna, Jayson L. Lusk, and David Davis (2014), “The Effect of Calorie Labels on Caloric Intake and Restaurant Revenue: Evidence from Two Full-Service Restaurants,” *Journal of Agricultural and Applied Economics*, 46 (2), 173–191.
- Finkelstein, Eric A., Kiersten L. Strombotne, Nadine L. Chan, and James Krieger (2011), “Mandatory Menu Labeling in One Fast-Food Chain in King County, Washington,” *American Journal of Preventive Medicine*, 40 (2), 122–127.
- Finkelstein, Stacey R. and Ayelet Fishbach (2010), “When Healthy Food Makes You Hungry,” *Journal of Consumer Research*, 37 (3), 357–367.
- Fishbach, Ayelet, Ronald S. Friedman, and Arie W. Kruglanski (2003), “Leading Us Not Unto Temptation: Momentary Allurements Elicit Overriding Goal Activation,” *Journal of Personality and Social Psychology*, 84 (2), 296–309.
- Food and Drug Administration (FDA) (2016), “A Labeling Guide for Restaurants and Retail Establishments Selling Away-From-Home Foods-Part II (Menu Labeling Requirements in Accordance with the Patient Protection Affordable Care Act of 2010); Guidance for Industry; Availability,” *Federal Register*, 81 (87), 27067–27068.
- Food and Drug Administration (FDA) (2014), “Food Labeling; Nutrition Labeling of Standard Menu Items in Restaurants and Similar Retail Food Establishments,” *Federal Register*, 79 (230), 71155–71259.
- Food and Drug Administration (FDA) (2017), “Food Labeling; Nutrition Labeling of Standard Menu Items in Restaurants and Similar Retail Food Establishments; Extension of Compliance Date; Request for Comments,” *Federal Register*, 82 (85), 20825–20829.
- Ford, Gary T., Darlene B. Smith, and John L. Swasy (1990), “Consumer Skepticism of Advertising Claims: Testing Hypotheses from Economics of Information,” *Journal of Consumer Research*, 16 (4), 433–441.
- Fornell, Claes and David F. Larcker (1981), “Evaluating Structural Equation Models with Unobservable Variables and Measurement Error,” *Journal of Marketing Research*, 18 (1), 39–50.

- Furst, Tanis, Margaret Connors, Carole A. Bisogni, Jeffery Sobal, and Laura Winter Falk (1996), "Food Choice: A Conceptual Model of the Process," *Appetite*, 26 (3), 247–266.
- Garg, Nitika, Brian Wansink, and J. Jeffrey Inman (2007), "The Influence of Incidental Affect on Consumers' Food Intake," *Journal of Marketing*, 71 (1), 194–206.
- Glanz, Karen, Michael Basil, Edward Maibach, Jeanne Goldberg, and Dan Snyder (1998), "Why Americans Eat What They Do; Taste, Cost, Convenience, and Weight Control Concerns on Food Consumption," *Journal of the American Dietetic Association*, 98 (10), 1118–1126.
- Grewal, Dhruv, Kent B. Monroe, and Ramayya Krishnan (1998), "The Effects of Price-Comparison Advertising on Buyers' Perceptions of Acquisition Value, Transaction Value, and Behavioral Intentions," *Journal of Marketing*, 4 (1), 46–59.
- Haws, Kelly L. and Karen Page Winterich (2013), "When Value Trumps Health in a Supersized World," *Journal of Marketing*, 77 (3), 48–64.
- Haws, Kelly L. and Peggy J. Liu (2016), "Half-Size Me? How Calorie and Price Information Influence Ordering on Restaurant Menus with Both Half and Full Entrée Portion Sizes," *Appetite*, 97 (1), 127–137.
- Hayes, Andrew F. (2013), *Introduction to Mediation, Moderation, and Conditional Process Analysis*. T. D. Little, ed. New York: The Guilford Press.
- Howlett, Elizabeth A., Scot Burton, Kenneth Bates, and Kyle Huggins (2009), "Coming to a Restaurant Near You? Potential Consumer Responses to Nutrition Information Disclosure on Menus," *Journal of Consumer Research*, 36 (3), 494–503.
- Hu, Ki-Tze and Peter M. Bentler (1999), "Cutoff for Fit Indexes in Covariance Structural Analysis: Conventional Criteria Versus New Alternatives," *Structural Equation Modeling: A Multidisciplinary Journal*, 6 (1) 1–55.
- Keller, Punam and Donald Lehmann (2008), "Designing Effective Health Communications: A Meta-Analysis," *Journal of Public Policy & Marketing*, 27 (2), 117–130.
- Keller, Scott B., Mike Landry, Jeanne Olson, Anne M. Velliquette, Scot Burton, and J. Craig Andrews (1997), "The Effects of Nutrition Package Claims, Nutrition Facts Panels, and Motivation to Process Nutrition Information on Consumer Product Evaluations," *Journal of Public Policy & Marketing*, 16 (2), 256–269.
- Kozup, John C., Elizabeth H. Creyer, and Scot Burton (2003), "Making Healthful Food Choices: The Influence of Health Claims and Nutrition Information on Consumers' Evaluations of Packaged Food Products and Restaurant Menu Items," *Journal of Marketing*, 67 (2), 19–34.

- Krieger, James W., Nadine L. Chan, Brian E. Saelens, Myduc L. Ta, David Solet, and David W. Fleming (2013), "Menu Labeling Regulations and Calories Purchased at Chain Restaurants," *American Journal of Preventive Medicine*, 44 (6), 595–604.
- Lastovicka, John L., Lance A. Bettencourt, Renee Shaw Hughner, and Ronald J. Kuntze (1999), "Lifestyle of the Tight and Frugal: Theory and Measurement," *Journal of Consumer Research*, 26 (1), 85–98.
- Liu, Peggy J., Kelly L. Haws, Cait Lamberton, Troy H. Campbell, and Gavan J. Fitzsimons (2015), "Vice-Virtue Bundles," *Management Science*, 61 (1), 204–228.
- Loewenstein, George (2011), "Confronting Reality: Pitfalls of Calorie Posting," *The American Journal of Clinical Nutrition*, 94 (4), 679–680.
- Long, Michael W., Deirdre K. Tobias, Angie L. Cradock, Holly Batchelder, and Steven L. Gortmaker (2015), "Systematic Review and Meta-Analysis of the Impact of Restaurant Menu Calorie Labeling," *American Journal of Public Health*, 105 (5), 11–24.
- Ma, Yu, Kusum L. Ailawadi, and Dhruv Grewal (2013), "Soda Versus Cereal and Sugar Versus Fat: Drivers of Healthful Food Intake and the Impact of Diabetes Diagnosis," *Journal of Marketing*, 77 (3), 101–120.
- Moorman, Christine (1990), "The Effects of Stimulus and Consumer Characteristics on the Utilization of Nutrition Information," *Journal of Consumer Research*, 17 (3), 362–374.
- Monroe, Kent B. and Ramayya Krishnan (1985), "The Effect of Price on Subjective Product Evaluations," in *Perceived Quality: How Consumers View Stores and Merchandise*, Jacob Jacoby and Jerry C. Olson, eds. Lexington, MA: Lexington Books, 209–232.
- Netemeyer, Richard G., William O. Bearden, and Subhash Sharma (2003), *Scaling Procedures: Issues and Applications*. Thousand Oaks, CA: Sage Publications, Inc.
- Newman, Christopher L., Elizabeth Howlett, and Scot Burton (2016), "Effects of Objective and Evaluative Front-of-Package Cues on Food Evaluation and Choice: The Moderating Influence of Comparative and Noncomparative Processing Contexts," *Journal of Consumer Research*, 42 (5), 749–766.
- Nikolova, Hristina Dzhogleva and J. Jeffrey Inman (2015), "Healthy Choice: The Effect of Simplified Point-of-Sale Nutritional Information on Consumer Food Choice Behavior," *Journal of Marketing Research*, 52 (6), 817–835.
- Nutrition Labeling and Education Act (NLEA) (1990), Public Law No. 101–535, 104 Stat. 2353 (codified in part at 21 U.S.C. 343).
- Parker, Jeffrey R. and Donald R. Lehmann (2014), "How and When Grouping Low-Calorie Options Reduces the Benefits of Providing Dish-Specific Calorie Information," *Journal of Consumer Research*, 41 (1), 213–235.

- Raghunathan, Rajagopal, Rebecca Walker Naylor, and Wayne D. Hoyer (2006), "The Unhealthy = Tasty Intuition and Its Effects on Taste Inferences, Enjoyment, and Choice of Food Products," *Journal of Marketing*, 70 (4), 170–184.
- Roberto, Christina A., Marlene B. Schwartz, and Kelly D. Brownell (2009), "Rationale and Evidence for Menu-Labeling Legislation," *American Journal of Preventive Medicine*, 37 (6), 546–551.
- Roberto, Christina A., Peter D. Larsen, Henry Agnew, Jenny Baik, and Kelly D. Brownell (2010), "Evaluating the Impact of Menu Labeling on Food Choices and Intake," *American Journal of Public Health*, 100 (2), 312–318.
- Ross, Jr., William T. and Elizabeth H. Creyer (1992), "Making Inferences About Missing Information: The Effects of Existing Information," *Journal of Consumer Research*, 19 (1), 14–25.
- Scott, Maura L., Stephen M. Nowlis, Naomi Mandel, and Andrea C. Morales (2008), "The Effect of Reduced Food Sizes and Packages on the Consumption Behavior of Restrained Eaters and Unrestrained Eaters," *Journal of Consumer Research*, 35 (3), 391–405.
- Sengupta, Jaideep and Rongrong Zhou (2007), "Understanding Impulsive Eaters' Choice Behaviors: The Motivational Influences of Regulatory Focus," *Journal of Marketing Research*, 44 (2), 297–308.
- Smith, Karen H. and Mary Ann Stutts (2003), "Effects of Short-Term Cosmetic Versus Long-Term Fear Appeals in Anti-Smoking Advertisements on the Smoking Behaviour of Adolescents," *Journal of Consumer Behaviour*, 3 (2), 157–177.
- Sowa, John F. (2014), *Principles of Semantic Networks: Explorations in the Representation of Knowledge*. Morgan Kaufmann.
- Stewart, David W. and Ingrid M. Martin (2004), "Advertising Disclosures: Clear and Conspicuous or Understood and Used?," *Journal of Public Policy & Marketing*, 23 (2), 183–192.
- Stewart, David W. and Ingrid M. Martin (1994), "Intended and Unintended Consequences of Warning Messages: A Review and Synthesis of Empirical Research," *Journal of Public Policy & Marketing*, 3 (1), 1–19.
- Suher, Jacob, Raj Raghunathan, and Wayne D. Hoyer (2016), "Eating Healthy or Feeling Empty? How the "Healthy = Less Filling" Intuition Influences Satiety," *Journal of the Association of Consumer Research*, 1 (1), 26–40.
- Tandon, Pooja S., Chuan Zhou, Nadine L. Chan, Paula Lozano, Sarah C. Couch, Karen Glanz, James Krieger, and Brian Saelens (2011), "The Impact of Menu Labeling on Fast-Food Purchases for Children and Parents," *American Journal of Preventive Medicine*, 41 (4), 434–438.

- VanEpps, Eric M., Julie S. Downs, and George Loewenstein (2016a), “Advance Ordering for Healthier Eating? Field Experiments on the Relationship Between the Meal Order–Consumption Time Delay and Meal Content,” *Journal of Marketing Research*, 55 (3), 369–380.
- VanEpps, Eric M., Julie S. Downs, and George Loewenstein (2016b), “Calorie Label Formats: Using Numeric and Traffic Light Calorie Labels to Reduce Lunch Calories,” *Journal of Public Policy & Marketing*, 35 (1), 26–36.
- Wansink, Brian, and Pierre Chandon (2006), “Can ‘Low-Fat’ Nutrition Labels Lead to Obesity,” *Journal of Marketing Research*, 43 (4), 605–617.
- Wansink, Brian, and Pierre Chandon (2014), “Slim by Design: Redirecting the Accidental Drivers of Mindless Overeating,” *Journal of Consumer Psychology*, 24 (3), 413–431.
- Wilcox, Keith, Beth Vallen, Lauren Block and Gavan Fitzsimons (2009), “Vicarious Goal Fulfillment: How the Mere Presence of a Healthy Option Leads to an Ironically Unhealthy Decision,” *Journal of Consumer Research*, 36 (3), 380–393.
- Young, Lisa R. and Marion Nestle (2012), “Reducing Portion Sizes to Prevent Obesity,” *American Journal of Preventive Medicine*, 43 (5), 565–568.
- Zeithaml, Valarie (1988), “Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence,” *Journal of Marketing*, 52 (3), 2–22.

Table 1.1**Studies 1 and 2: Standardized Factor Loadings, Variance Extracted, and Reliabilities for the Food-Value Orientation Measures**

Food-Value Orientations	Study 1 Standardized Factor Loadings	Study 2 Standardized Factor Loadings
Taste-Value Orientation (TVO)		
1. I often consider the taste of different foods to be sure that I get my money's worth.	.74	.87
2. I often consider how certain foods taste to be sure that I get the tastiest food for the money I spend.	.84	.86
3. When I make food choices, I often consider factors associated with taste.	.88	.87
4. When purchasing a food product, I try to maximize the tastiness I receive for the money I spend.	.85	.90
5. When considering whether or not food is a good value, taste is an important consideration.	.84	.82
Variance Extracted (VE)	.69	.74
Construct Reliability	.92	.94
Healthfulness-Value Orientation (HVO)		
1. When I buy food products, I like to be sure that I am getting my money's worth in terms of how healthy the food is.	.84	.95
2. I often consider how healthy different foods are to be sure that I get nutritious food for the money I spend.	.90	.92
3. It is important to me to get healthy foods for the money I spend.	.87	.93
4. When purchasing a food product, I try to maximize the healthiness of the product for the money I spend.	.90	.95
Variance Extracted (VE)	.77	.88
Construct Reliability	.93	.97

Table 1.1 (Cont.)

Food-Value Orientations	Study 1 Standardized Factor Loadings	Study 2 Standardized Factor Loadings
Quantity-Value Orientation (QVO)		
1. I don't feel like I get my money's worth if I pay a lot of money for food and only get a small amount.	.74	.82
2. When purchasing a food product, I try to maximize the amount I receive for the money I spend.	.82	.86
3. When considering whether or not food is a good value, quantity is an important consideration.	.80	.89
4. It is important for me to get a lot of food for the money I spend.	.91	.96
5. As I increase my spending on food, I should receive higher quantities of food.	.84	.89
Variance Extracted (VE)	.68	.78
Construct Reliability	.91	.95

Table 1.2

Study 1: Means and Correlations for Food-Value Orientation Scales, Demographics, and Related Constructs

	Taste- Value Orientation (TVO) 'a'	Healthfulness- Value Orientation (HVO) 'b'	Quantity- Value Orientation (QVO) 'c'
Means	5.44 ^{b,c}	5.09 ^a	5.17 ^a
SD	1.04	1.35	1.21
Correlations			
TVO	0.92		
HVO	0.06	0.93	
QVO	0.23**	-0.12*	0.91
Age	0.02	0.10	-0.12*
Income	0.04	-0.01	-0.13*
Education	-0.01	0.05	-0.12*
Nutrition Knowledge	-0.09	0.40**	-0.20**
Nutrition Motivation	-0.06	0.53**	-0.23**
Perceived Health-Risk	0.09	-0.23**	0.06
BMI	0.09	-0.14*	0.08

* $p < .05$, ** $p < .01$

Notes: Means at the top of the table are based on seven-point scales. Superscripts adjacent to the means indicate significant differences ($p < .05$ or better) between the mean values. For example, the superscripts for the “a” cell (TVO) indicate that the taste-value orientation mean is significantly greater than the means for the other two orientations (labeled “b” and “c”). Values on diagonals of the correlation matrix are coefficient α reliabilities. Correlations between interval and ratio scaled variables (i.e., food-value orientations, age, nutrition knowledge, nutrition motivation, health-risk, and body mass index) are Pearson correlations. Correlations between ordinal scaled variables (i.e., income and education) and the food-value orientations are Spearman’s rank-order correlations.

Table 1.3

Study 2: Means and Correlations for Food-Value Orientation Scales, Demographics, and Related Constructs

	Taste- Value Orientation (TVO) 'a'	Healthfulness- Value Orientation (HVO) 'b'	Quantity- Value Orientation (QVO) 'c'
Means	5.85 ^{b,c}	4.99 ^a	5.20 ^a
SD	0.94	1.38	1.40
Correlations			
TVO	0.94		
HVO	0.15	0.97	
QVO	0.17*	-0.14*	0.95
Age	0.09	0.06	-0.01
Income	0.03	-0.04	-0.11
Education	-0.10	-0.02	-0.18*
Nutrition Knowledge	0.10	0.39**	-0.06
Nutrition Motivation	0.04	0.60**	-0.06
Perceived Health-Risk	-0.05	-0.17**	0.06
BMI	0.04	-0.09	0.13

* $p < .05$, ** $p < .01$

Notes: Means at the top of the table are based on seven-point scales. Superscripts adjacent to the means indicate significant differences ($p < .05$ or better) between the mean values. For example, the superscripts for the “a” cell (Taste-value orientation) indicate that the taste-value orientation mean is significantly greater than the means for the other two orientations (labeled “b” and “c”). Numbers on diagonals of the correlation matrix are coefficient α reliabilities. Correlations between interval and ratio scaled variables (i.e., food-value orientations, age, nutrition knowledge, nutrition motivation, health-risk, and body mass index) are Pearson correlations. Correlations between ordinal scaled variables (i.e., income and education) and the food-value orientations are Spearman’s rank-order correlations.

Table 1.4

Study 3: Differences in Food-Value Orientation Means (SDs) Across BMI Categories

	Normal Weight (<i>n</i> = 71)	Overweight (<i>n</i> = 77)	Obese (<i>n</i> = 53)
	‘a’	‘b’	‘c’
Health-value orientation	4.86 (1.46) ^c	4.73 (1.40)	4.32 (1.50) ^a
Quantity-value orientation	4.58 (1.58) ^c	4.56 (1.47) ^c	5.17 (1.31) ^{a,b}
Taste-value orientation	5.65 (1.15)	5.71 (1.05)	5.85 (0.97)

Notes: This table provides the means (standard deviations) for each food-value orientation across the categories of BMI. Means are based on seven-point scales. Superscripts adjacent to the means indicate significant differences ($p < .05$ or better) in the mean values between the BMI categories.

Table 1.5

Study 6: Hierarchical Regression Results for Calories Ordered

Independent Variables	Model 1		Model 2		Model 3	
	b	<i>p</i> -value	b	<i>p</i> -value	b	<i>p</i> -value
Constant	1220.12	< .01	1220.22	< .01	1219.50	< .01
Controls						
Calories Ordered at T1	.27	< .01	.27	< .01	.25	< .01
Education	-15.49	.51	-16.19	.48	-16.15	.48
Income	-1.24	.91	-2.95	.79	8.97	.42
Age	-5.94	.01	-5.52	.01	-6.77	< .01
Gender	37.29	.50	6.88	.90	19.40	.71
IV's Predicted to Decrease Calories Ordered						
Calorie Provision (CP)	—	—	-184.03	< .01	-170.36	< .01
HVO	—	—	-41.12	.02	-25.31	.16
CP x HVO	—	—	-64.09	.07	-62.88	.07
IV's Predicted to Increase Calories Ordered						
TVO	—	—	—	—	84.52	.01
QVO	—	—	—	—	36.88	.06
CP x TVO	—	—	—	—	79.10	.21
CP x QVO	—	—	—	—	-55.53	.15
R ²	.13		.19		.25	
Model F-value	F(5, 265) = 7.66 <i>p</i> < .01		F(8, 262) = 7.71 <i>p</i> < .01		F(12, 258) = 7.00 <i>p</i> < .01	
F for change in R ²	—		F(3, 262) = 6.94 <i>p</i> < .01		F(4, 258) = 4.72 <i>p</i> < .01	

Notes: The dependent variable was total meal calories for the chosen meal at Time 2. In this online setting, participants were asked to order from the menu as they would for their evening meal on an ordinary day, including an entrée and, if desired, side(s) and a drink. These calorie levels were gathered from menu items at major table service restaurants. HVO is healthfulness-value orientation, TVO is taste-value orientation, and QVO is quantity-value orientation. Independent variable predictors were centered at their means prior to creating interaction terms and conducting the analyses.

Table 1.6

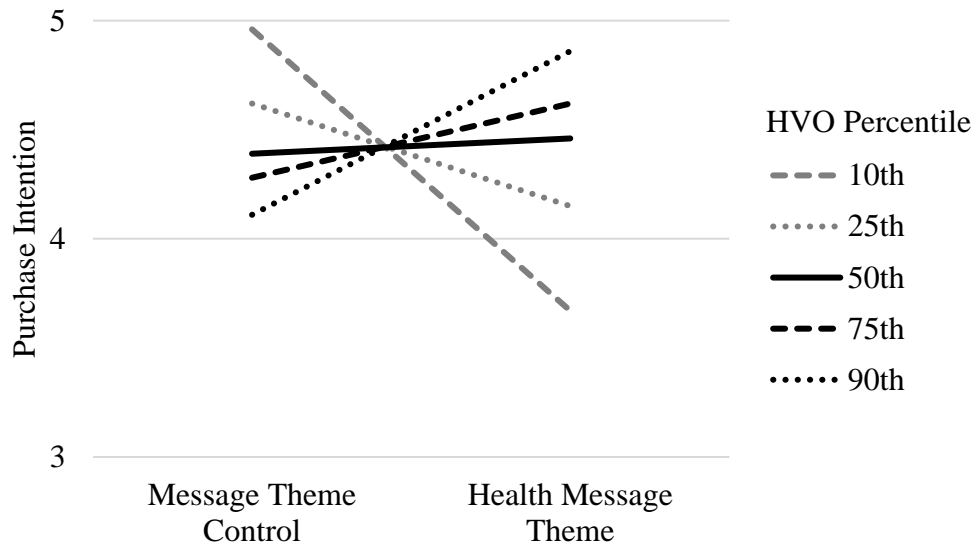
Study 7: Hierarchical Regression Results for Calories Ordered

Independent Variables	Model 1		Model 2		Model 3	
	b	<i>p</i> -value	b	<i>p</i> -value	b	<i>p</i> -value
Constant	1002.11	< .01	1005.29	< .01	1005.58	< .01
Controls						
Education	-28.18	.10	-31.48	.07	-25.19	.14
Income	-1.12	.89	-.07	.99	5.33	.50
Age	-5.24	< .01	-4.48	< .01	-4.55	< .01
Gender	156.22	< .01	131.75	< .01	140.98	< .01
IV's Predicted to Decrease Calories Ordered						
Calorie Labeling (CL)	—	—	19.68	.65	1.01	.98
HVO	—	—	-53.58	.01	-48.76	.01
CL x HVO	—	—	-51.43	.16	-74.69	.04
IV's Predicted to Increase Calories Ordered						
TVO	—	—	—	—	-8.63	.71
QVO	—	—	—	—	40.18	.02
CL x TVO	—	—	—	—	113.74	.01
CL x QVO	—	—	—	—	-31.29	.32
R ²	.14		.18		.22	
Model F-value	F(4, 228) = 8.89 <i>p</i> < .01		F(7, 225) = 6.97 <i>p</i> < .01		F(11, 221) = 5.66 <i>p</i> < .01	
F for change in R ²	—		F(3, 225) = 3.95 <i>p</i> = .01		F(4, 221) = 2.93 <i>p</i> = .02	

Notes: The dependent variable was total meal calories for the chosen meal. As shown in Appendix 1.5, this restaurant was a fast-casual restaurant with a range of menu options. HVO is healthfulness-value orientation, TVO is taste-value orientation, and QVO is quantity-value orientation. Independent variable predictors were centered at their means prior to creating interaction terms and conducting the analyses.

Figure 1.1

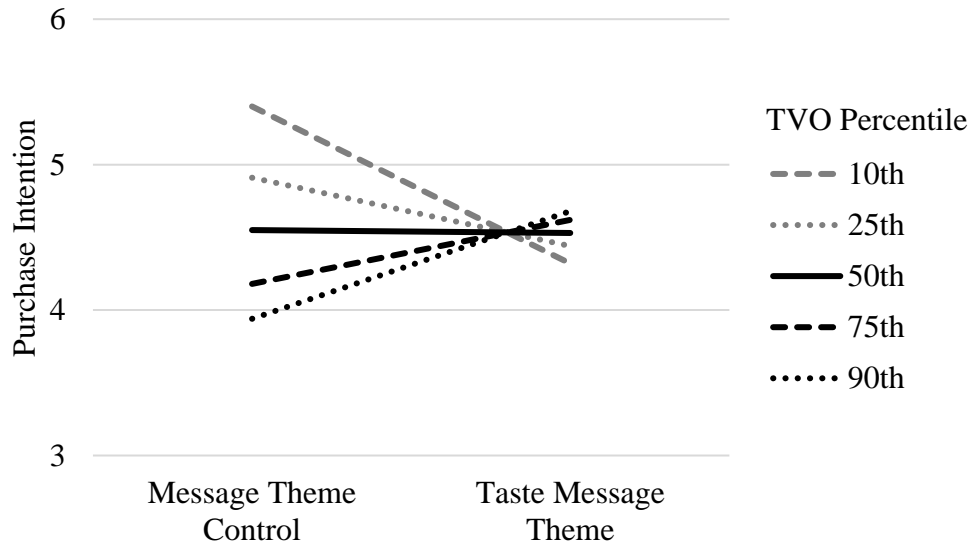
Study 4a: Effect of the Health Advertisement Message Theme and Health-Value Orientation (HVO) Interaction on Purchase Intention



Notes: At the 10th percentile of health-value orientation (HVO), the health message theme (versus the health message theme control) had a negative effect on purchase intentions ($p < .05$), while at the 90th percentile of HVO, the health message theme (versus the health message theme control) had a positive effect on purchase intentions ($p = .07$).

Figure 1.2

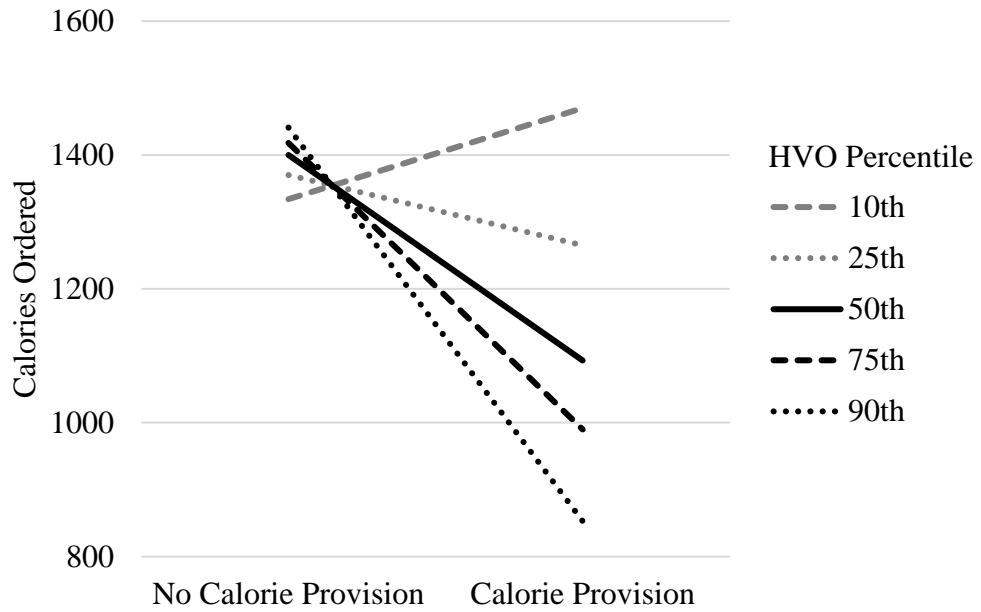
Study 4b: Effect of the Taste Advertisement Message Theme and Taste-Value Orientation Interaction on Purchase Intention



Notes: At the 10th percentile of taste-value orientation (TVO), the taste message theme (versus the taste message theme control) had a negative effect on purchase intentions ($p < .05$), while at the 90th percentile of TVO, the taste message theme (versus the taste message theme control) had a positive effect on purchase intentions ($p = .05$).

Figure 1.3

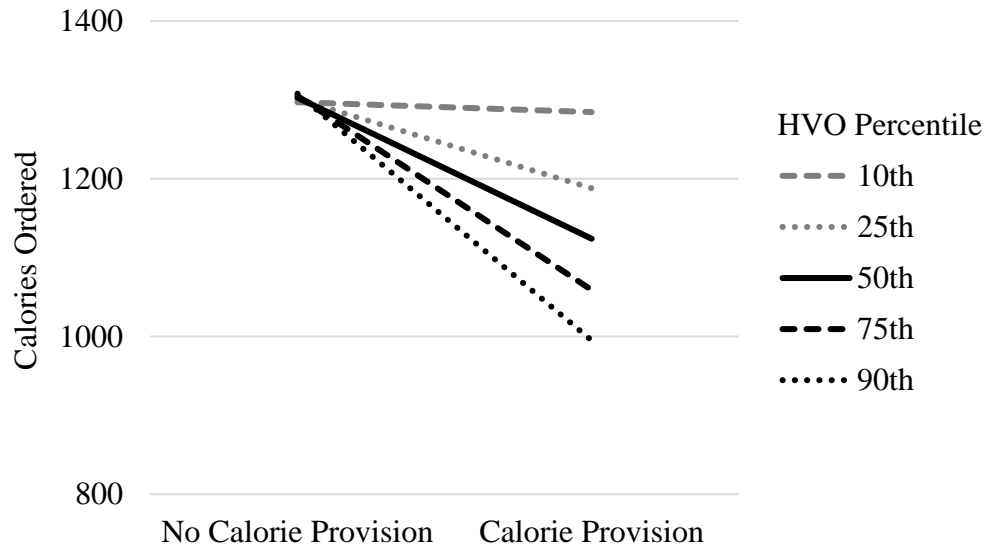
Study 6: Effect of the Calorie Information Provision by Healthfulness-Value Orientation (HVO) Interaction on Calories Ordered



Note: This plot shows the results of the calorie information provision by HVO interaction on calories ordered.

Figure 1.4

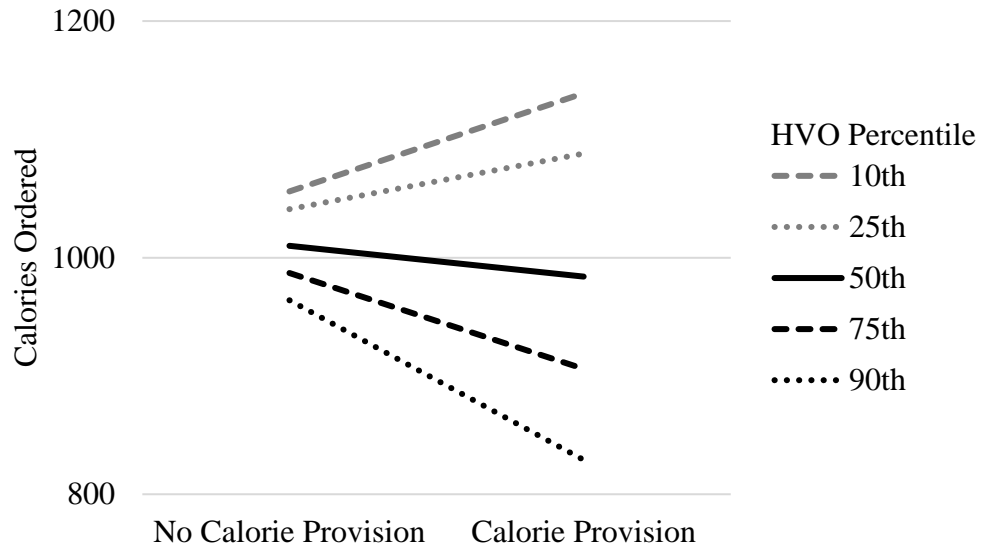
Study 6: Effect of the Calorie Information Provision by Healthfulness-Value Orientation (HVO) Interaction on Calories Ordered



Note: This plot shows the results of the calorie information provision by HVO interaction on calories ordered, accounting for the effects of HVO, TVO, QVO, calorie information provision, and the TVO- and QVO-calorie information provision interactions.

Figure 1.5

Study 7: Effect of the Calorie Information Provision by Healthfulness-Value Orientation (HVO) Interaction on Calories Ordered



Note: This plot shows the results of the calorie information provision by HVO interaction on calories ordered, after accounting for the effects of HVO, TVO, QVO, calorie information provision, and the TVO- and QVO-calorie information provision interactions.

Appendix 1.1

Overview of Studies that Examined the Effect of Menu Calorie Information Provision on the Calorie Content of Meal Choices in Restaurant Settings

Study	Design	Intervention and Control	Setting	Sample	Outcome	Results
Downs et al. (2013)	Longitudinal experiment without control	Provision of menu calorie labeling in NYC; participants randomly assigned to receive per meal anchor, daily anchor, or no anchor	Fast-food restaurants	1094 adults	Calories ordered per meal	Nonsignificant increase in calories ordered
Dumanovsky et al. (2011)	Longitudinal experiment without control	Provision of menu calorie labeling in NYC	Fast-food restaurants	15,798 adults	Calories ordered per meal	Nonsignificant increase in calories ordered
Elbel et al. (2011)	Longitudinal experiment with control	Provision of menu calorie labeling in NYC; no labeling in control city	Fast-food restaurants	349 children and adolescents	Calories ordered per meal	Calorie labeling did not affect calories ordered
Elbel et al. (2009)	Longitudinal experiment with control	Provision of menu calorie labeling in NYC; no labeling in control city	Fast-food restaurants	1,125 adults	Calories ordered per meal	Calorie labeling did not affect calories ordered
Ellison et al. (2013)	Experiment with control	Participants randomly assigned to order from restaurant menu with calorie labeling, labeling plus traffic light, or no labeling	Sit-down university restaurant	138 adults	Calories ordered per meal	Nonsignificant increase in calories ordered

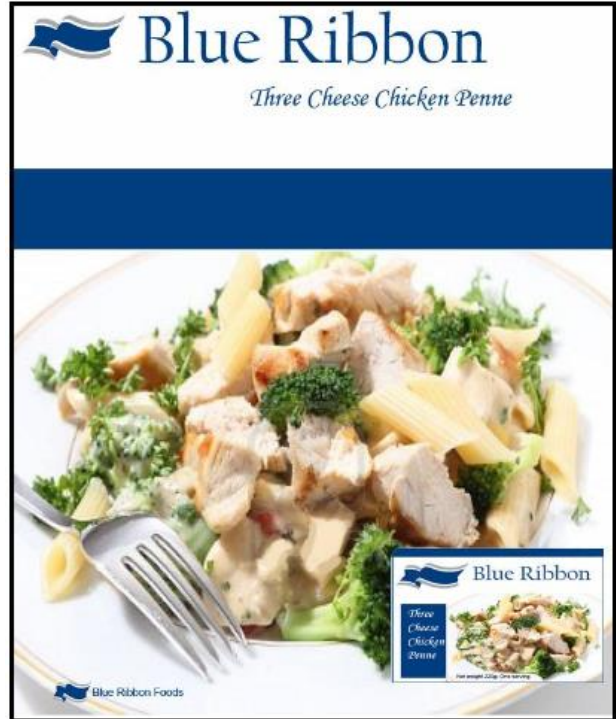
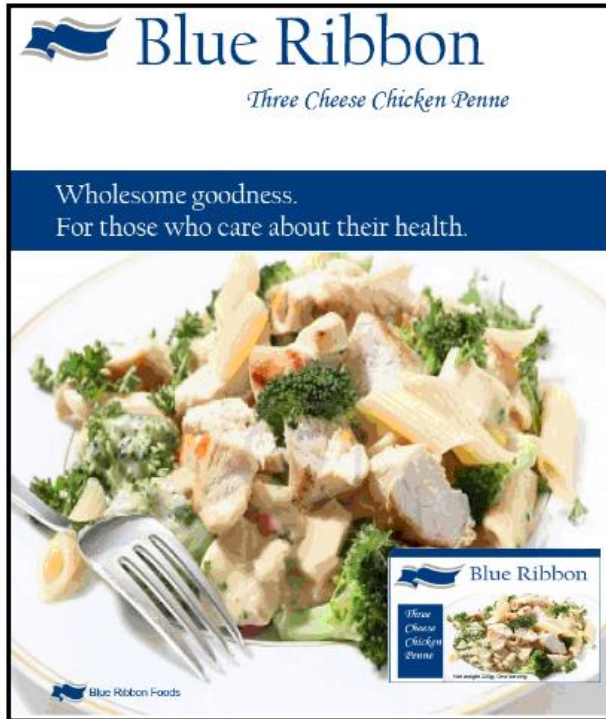
Appendix 1.1 (Cont.)

Study	Design	Intervention and Control	Setting	Sample	Outcome	Results
Bollinger et al. (2011)	Longitudinal experiment with control	Provision of menu calorie labeling in NYC; no labeling in Boston and Philadelphia	Large coffee shop chain	Transaction data	Calories per transaction	Minor but significant decrease (−14.4) in calories per transaction
Finkelstein et al. (2011)	Longitudinal experiment with control	Provision of menu calorie labeling in King County, WA; no calorie labeling in control county	Fast-food restaurants	Transaction data	Calories per transaction	Calorie labeling did not affect calories ordered
Krieger et al. (2013)	Longitudinal experiment with control	Provision of menu calorie labeling in King County, WA	Fast-food restaurants and coffee chain	7,235 participants over the age of 13	Calories ordered per meal	Coffee chain: significant decrease in calories ordered; fast-food restaurant: effect was nonsignificant
Tandon et al. (2011)	Longitudinal experiment without control	Provision of menu calorie labeling in King County, WA; no calorie labeling in control county	Fast-food restaurants	133 pairs of parents and children	Calories ordered per meal	Calorie labeling did not affect calories ordered

Notes: This table was adapted from Long et al. (2015) and provides an overview of the studies that have been conducted to date which examine the effect of menu calorie information provision on calories ordered in restaurant settings. Based on the six controlled studies shown above, Long et al. (2015) found that calorie information provision resulted in a nonsignificant decrease in calories ordered (i.e., −7.63 calories).

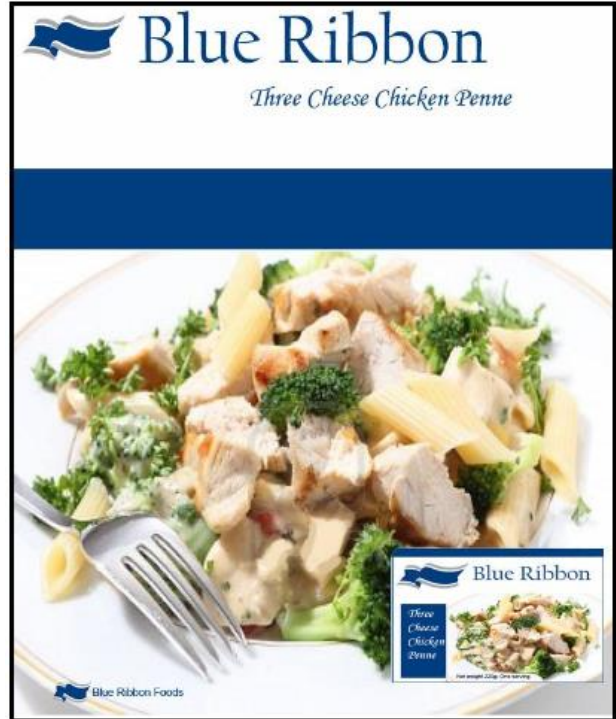
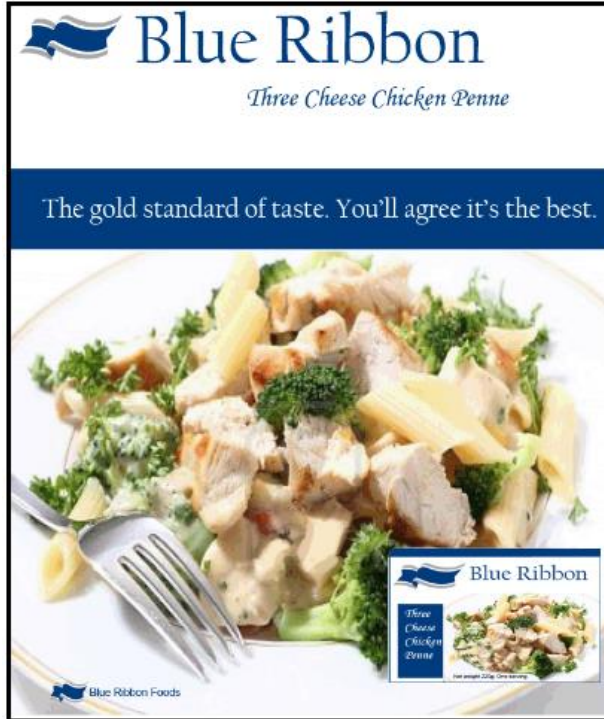
Appendix 1.2

Study 4a: Experimental Stimuli



Appendix 1.3

Study 4b: Experimental Stimuli



Appendix 1.4

Studies 5 and 6: Online Experimental Stimuli

No Calorie Information Provision

CHICKEN, PASTA & SEAFOOD

No sides included

- Blackened Tilapia
- Chicken Quesadilla
- Shrimp Scampi Linguini
- New England Fish and Chips
- Macaroni and cheese with chicken tenders

MENU

TODAY'S SPECIAL

Grilled chicken or steak fajitas

BURGERS & STEAKS

No sides included

- Classic burger
- Classic burger with cheddar
- 7 oz. House sirloin
- 12 oz. Ribeye
- Mushroom Swiss burger

SANDWICHES

- Classic Turkey Breast Sandwich
- Clubhouse Grille, turkey breast, cheddar and Jack cheese with bacon lettuce, tomato, and mayo
- Turkey, Bacon, and Avocado Sandwich

DRINKS

16 oz.

- Coke
- Diet Coke
- Sprite
- Iced Tea
- Lemonade

ENTREE SALADS

- Grilled Chicken Caesar Salad
- Fiesta Chicken Chopped Salad
- Pecan-cruste Chicken Salad

SIDES

- Green Goddess Wedge Side Salad
- Real Idaho Potato French Fries
- Steamed Broccoli
- New England Clam Chowder
- Roasted Corn On The Cob

Calorie Information Provision

CHICKEN, PASTA & SEAFOOD

No sides included

- Blackened Tilapia
450 calories
- Chicken Quesadilla
960 calories
- Shrimp Scampi Linguini
1010 calories
- New England Fish and Chips
1970 calories
- Macaroni and cheese with chicken tenders
1830 calories

MENU

TODAY'S SPECIAL

Grilled chicken or steak fajitas
925 calories

BURGERS & STEAKS

No sides included

- Classic burger
780 calories
- Classic burger with cheddar
870 calories
- 7 oz. House sirloin
280 calories
- 12 oz. Ribeye
670 calories
- Mushroom Swiss burger
1100 calories

SANDWICHES

- Classic Turkey Breast Sandwich
560 calories
- Clubhouse Grille, turkey breast, cheddar and Jack cheese with bacon lettuce, tomato, and mayo
1120 calories
- Turkey, Bacon, and Avocado Sandwich
980 calories

DRINKS

16 oz.

- Coke
190 calories
- Diet Coke
0 calories
- Sprite
200 calories
- Iced Tea
5 calories
- Lemonade
200 calories

ENTREE SALADS

- Grilled Chicken Caesar Salad
800 calories
- Fiesta Chicken Chopped Salad
900 calories
- Pecan-cruste Chicken Salad
1340 calories

SIDES

- Green Goddess Wedge Side Salad
550 calories
- Real Idaho Potato French Fries
440 calories
- Steamed Broccoli
40 calories
- New England Clam Chowder
380 calories
- Roasted Corn On The Cob
190 calories

Appendix 1.5

Study 7: Field Experiment Menu Stimuli

Panini

Sandwiches

Served with Fresh Fried Potato Chips and a Pickle Spear

Grilled Meatloaf Cheddar Cheese, Mayo, Grilled Onion, Ketchup Glaze	1150 Cal 9.75
Smoky Turkey Smoked Turkey, Applewood Bacon, Smoked Cheddar, Whole Grain Mustard	795 Cal 8.95
French Bread Smoked Ham, Grilled Onions, Swiss Cheese, Garlic-Herb Mayo	850 Cal 7.95
Pimento Cheese & Bacon A Slightly Smoky Southern Classic, Applewood Bacon	1085 Cal 6.95
Triple Cheese Cheddar, Havarti, Swiss, Garlic-Herb Mayo	1080 Cal 6.75
Quesadilla	
Pulled Pork 1155 Cal 8.25	Chicken 1080 Cal 8.95
Vegetarian 915 Cal 7.95	

Stuffed Full Of Cheddar Cheese, Black Bean and Corn Salsa, and Your Choice of Pork, Chicken, OR Spinach & Grilled Onions. Served with Sour Cream, Fresh Salsa, and Tortilla Chips

Flatbreads

Served with Fresh Fried Potato Chips

Chicken Basil Chicken Breast, Grape Tomatoes, Red Bell Peppers, Petite Greens, Garlic-Herb Mayo, Basil Pesto	815 Cal 5.99
Pesto Portabella Roasted Portabellas, Red Onion, Basil Pesto, Havarti Cheese, Balsamic Reduction, Green Onions	745 Cal 5.99

Sandwiches are Served on White (+20 Cal), Multi Grain (+0 Cal), Marble Rye (+60 Cal), Ciabatta (-20 Cal), or in a Whole Grain Wrap (+50 Cal). Add Bacon (+90 Cal) to Any Sandwich 1.00.

Panini

Sandwiches

Served with Fresh Fried Potato Chips and a Pickle Spear

Grilled Meatloaf Cheddar Cheese, Mayo, Grilled Onion, Ketchup Glaze	9.75
Smoky Turkey Smoked Turkey, Applewood Bacon, Smoked Cheddar, Whole Grain Mustard	8.95
French Bread Smoked Ham, Grilled Onions, Swiss Cheese, Garlic-Herb Mayo	7.95
Pimento Cheese & Bacon A Slightly Smoky Southern Classic, Applewood Bacon	6.95
Triple Cheese Cheddar, Havarti, Swiss, Garlic-Herb Mayo	6.75
Quesadilla	
Pulled Pork 8.25	Chicken 8.95
Vegetarian 7.95	

Stuffed Full Of Cheddar Cheese, Black Bean and Corn Salsa, and Your Choice of Pork, Chicken, OR Spinach & Grilled Onions. Served with Sour Cream, Fresh Salsa, and Tortilla Chips

Flatbreads

Served with Fresh Fried Potato Chips

Chicken Basil Chicken Breast, Grape Tomatoes, Red Bell Peppers, Petite Greens, Garlic-Herb Mayo, Basil Pesto	5.99
Pesto Portabella Roasted Portabellas, Red Onion, Basil Pesto, Havarti Cheese, Balsamic Reduction, Green Onions	5.99

Sandwiches are Served on White, Multi Grain, Marble Rye, Ciabatta, or in a Whole Grain Wrap. Add Bacon to Any Sandwich 1.00.

Note: The stimuli examples shown are a single page from a multiple page menu.

ESSAY 2

THE EFFECTS OF VOLUNTARY VERSUS MANDATORY MENU CALORIE

LABELING ON CONSUMERS' RESPONSES TO FOOD RETAILERS

Abstract

Restaurants with 20 or more locations nationwide will soon be required to disclose calorie information on menus and menu boards. Food retailers not included in this mandate can choose to voluntarily provide calorie information. To better understand the managerial implications of this major policy change, this research examines how consumers' retailer-related responses are affected by menu calorie labeling. A framework based on attribution theory and consumer information processing literatures is developed, and five studies, including two restaurant field studies, are used to test the proposed direct, moderating, and mediating effects derived from this conceptualization. Findings across the studies show that menu calorie labeling has a positive impact on retailer-related outcomes. However, these effects are attenuated when the restaurant is perceived to be more (versus less) healthful and when menu calorie labeling is mandatory (versus voluntary). The implications of these findings for retail and restaurant management are discussed.

Introduction

Over two-thirds of adults in the United States are either overweight or obese, and this has created a public health crisis (CDC 2017). Consequently, there is currently substantial interest in marketers' communication of nutrition information to consumers. While the disclosure of calorie and nutrient information on packaged food products has been required for over 20 years, retailers who offer food prepared for immediate consumption have been exempt from this requirement (Food and Drug Administration (FDA) 1993). Sales of away-from-home foods account for over one-half of the \$1.59 trillion that Americans spend on food each year (ERS 2017), and one-third of consumers' total calorie consumption comes from these foods (Lin, Guthrie, and Frazão 1999); this makes away-from-home foods a major omission from previous legislation. In addition, research has found that meals prepared outside the home are typically higher in calories than meals prepared at home (Guthrie, Lin, and Frazão 2002; Nestle 2003; Todd, Mancino, and Lin 2010). Consumers are often unaware of this fact which means that they may frequently underestimate the calorie content of their away-from-home meals (Burton and Creyer 2004; Burton et al. 2006; Wansink and Chandon 2006). The large expenditures on food prepared outside the home (i.e., \$800 billion in 2015; ERS 2017), coupled with the high-calorie content of those meals (Variyam 2005), has focused attention on the potential role restaurants can play in the fight against obesity (Downs et al. 2013).

More specifically, chain restaurants and other retail food establishments (e.g., convenience stores, grocery store delicatessens, and coffee shops) with 20 or more locations are required by the Patient Protection and Affordable Care Act (ACA) of 2010 to provide calorie information on menus and menu boards; however, the compliance date for this mandate has

recently been extended to May 2018 (FDA 2014; 2016; 2017). This requirement will affect an estimated 278,000 retailers at an initial cost of \$315 million; ongoing annual costs are expected to be about \$44 million (FDA 2014). Small retailers and chains not covered by this legislation may elect to voluntarily disclose calorie information on their menus and menu boards by registering with the FDA (FDA 2014). Not surprisingly, this mandate has faced some heavy industry opposition from some large chains. Not only have retailers argued that mandatory calorie labeling is too expensive to implement, many chains have feared that they would lose business once the high-calorie levels of their food became public knowledge (Goldman 2015; Roberto, Schwartz, and Brownell 2009; Rudd Center for Food Policy and Obesity 2008; VanEpps et al. 2016). In contrast, proponents of mandatory calorie labeling argue that consumers have the right to know the calorie content of the food they consume so they can make more informed, and potentially more healthful, choices (Bassett et al. 2008; Burton et al. 2006; Pomeranz and Brownell 2008; Long et al. 2015; Wansink and Chandon 2006).

Given that many restaurants will soon be required to disclose calories on menus and menu boards and others have the option to do so, the primary purpose of this research is to understand the impact of menu calorie labeling on consumers' retailer-related responses (e.g., patronage intentions). Many consumers are increasingly concerned about their health and diet (IFIC 2012; Trivedi 2011). For example, national public opinion polls show that approximately 83% of adult Americans favor menu calorie labeling (Rudd Center for Food Policy and Obesity 2008), a fact that has significant potential strategic implications for restaurants and other food retail establishments (Nielsen 2015). Therefore, in this research, I adopt a retail firm-focused perspective and draw from the discounting principles of attribution theory to examine the consequences of menu calorie labeling. Since calorie labeling is important to many consumers, it

may be a beneficial strategic decision for retailers to disclose calorie information even if this action is not required. That is, consumers' perceptions of a firm and their patronage intentions may benefit from favorable attributions that result from the voluntary provision of calorie information. However, the potential consequences of menu calorie labeling are also expected to be influenced by the restaurant's position in the market. More specifically, I posit that consumers' responses to calorie labeling may differ depending on the perceived healthfulness of the restaurant. Thus, to expand our understanding of these issues and to provide marketers in the restaurant industry with much needed insights into the effects of menu calorie labeling, I draw from attribution theory to address the following research questions: (1) Will menu calorie labeling affect consumers' perceptions of restaurants' concern for customer well-being, and will this effect extend to patronage intentions, attitudes toward restaurants, and restaurant attribute expectations?, (2) Will these positive direct and indirect effects of menu calorie labeling be attenuated when menu calorie labeling is mandatory (versus voluntary)?, and (3) Will the perceived healthfulness of a restaurant have direct or moderating effects on consumers' responses to restaurants? To address these research questions, a conceptual framework is developed and specific hypotheses concerning these direct, moderating, and mediating effects are constructed. Five studies, including two restaurant field studies, are used to test these hypotheses and provide support for the conceptual framework. Finally, the managerial implications associated with the findings of this research are discussed.

Voluntary Versus Mandatory Menu Calorie Labeling

While calorie labeling on menus and menu boards will be mandated for restaurant firms with more than 20 outlets, provision of this nutrition information is optional for retailers with fewer than 20 outlets (FDA 2014). Therefore, both restaurants who *must* disclose calorie levels on menus and menu boards and restaurants who *choose* to do so voluntarily need to understand how consumers' perceptions and evaluations of retailers are influenced by the availability of this information. Many consumers report that they are highly concerned about their health and diet (IFIC 2012; Nielsen 2015; Trivedi 2011) and thus favor the disclosure of calorie and nutrient content information (Lando and Labiner-Wolfe 2007; Rudd Center for Food Policy and Obesity 2008). Therefore, consumers are likely to appreciate the voluntary provision of calorie information, especially in a complex choice environment (Newman, Howlett, and Burton 2014). In other words, I suggest that restaurants may benefit from the voluntary disclosure of this information.

Attribution theory offers a framework for understanding the potentially favorable effects of calorie disclosure on menus and menu boards (Folkes 1988; Jones and Davis 1965; Kelley 1967). Consumers make inferences about a firm's decision motives via attributional processing (Friestad and Wright 1994). These specific attributions, in turn, may affect perceptions and evaluations of the retailer (Cheema and Patrick 2008; Ellen, Mohr, and Webb 2000; Forehand and Grier 2003; Newman, Howlett, and Burton 2014; Puccinelli et al. 2009). Drawing from attribution theory, prior research shows that consumers reward firms that put forth extra effort, such as neatly organizing product displays, by increasing their evaluations and choice of these firms (Morales 2005). In terms of the effort exerted to provide consumers with nutrition

information, research on the front-of-package nutrition labeling of consumer packaged goods and point-of-purchase nutrition signage suggests that the voluntary provision of nutrition information has a positive influence on retailer-related outcomes (Achabal et al. 1987).

Drawing from the principles of attribution theory (Folkes 1988; Jones and Davis 1965; Kelley 1967), I posit that consumers will make favorable attributions about the retailer when calorie information is disclosed. Specifically, given the link between calorie consumption and consumer health, coupled with concerns related to increases in obesity, consumers are likely to believe that a restaurant is more concerned about the needs, wants, and well-being of its customers when calorie information is disclosed. In turn, the favorable effects calorie labeling has on consumers' perceptions of the restaurant's concern for its customers' well-being should positively extend to other firm-related outcomes, such as attitudes toward the retailer and retail patronage (Achabal et al. 1987; Newman, Howlett, and Burton 2014; Pan and Zinkhan 2006). That is, I also suggest that there will be a positive mediation effect of calorie labeling on consumers' attitudes toward the restaurant and patronage intentions through perceived restaurant concern (c.f., Andrews, Burton, and Kees 2011; Newman, Howlett, and Burton 2014). A conceptual model of these proposed relationships is shown in Figure 2.1.

Attribution theory suggests that people search for causes of specific events (e.g., a nutrition information disclosure) (Heider 1958; Kelley 1967). Furthermore, according to the discounting principle of attribution theory, the positive effects of a firm's action are substantially reduced when that behavior can be attributed to another external factor or cause rather than the firm itself (Folkes 1988; Kelley 1973). For example, if consumers believe that a firm's benevolent behavior serves as an essential component of a sales strategy, they are likely to view that action as a persuasion attempt rather than just a simple favor (Cialdini 1993; Morales 2005).

Similarly, loyalty program rewards typically result in positive consumer responses. However, when firms establish clear loyalty program rules, consumers tend to attribute the reward to their own actions, thereby weakening positive firm-related attributions (Steinhoff and Palmatier 2014). Therefore, if consumers are informed that a restaurant is required by law to provide calorie information, then presumably the positive effects of the disclosure will be reduced because the act cannot be solely attributed to the retailer. Instead, consumers attribute the disclosure of this to a mandatory action by the firm to satisfy an external requirement. As shown in the conceptual model in Figure 2.1, the positive direct effect of menu calorie labeling on a restaurant's perceived concern for its customers, and its indirect effects on consumers' attitudes towards the restaurant and their patronage intentions, will be reduced when the restaurant's provision of calorie information is perceived as mandatory rather than voluntary. Formal predictions for the effects of voluntary and mandatory calorie provision on retailer-related outcomes are offered below.

- H1: Menu calorie labeling has a positive effect on consumers' perceptions of the restaurant's concern for its customers' well-being.
- H2: The positive effects of menu calorie labeling on consumers' (a) attitudes toward the restaurant and (b) patronage intentions are mediated by perceptions of the restaurant's concern for its customers' well-being.
- H3: The positive (a) direct and (b) indirect effects of menu calorie labeling are attenuated when the menu calorie labeling is mandatory rather than voluntary.

Moderating Role of a Restaurant's Perceived Healthfulness

Since many consumers are concerned about their health (IFIC 2012; Nielsen 2015; Trivedi), the positive influence of health claims and perceived healthfulness on consumers' product evaluations, attitudes, and behavioral intentions found in prior experimental research is not surprising (Andrews, Burton, and Netemeyer 2000; Andrews, Netemeyer, and Burton 1998; Balasubramanian and Cole 2002; Burton, Andrews, and Netemeyer 2000; Berry, Burton, and Howlett 2017; Garretson and Burton 2000; Howlett et al. 2009; Keller et al. 1997; Kozup, Creyer, and Burton 2003). Consistent with these findings, empirical research indicates that health and nutrition claims made on food products are positively associated with product demand and firm performance (Cao and Yan 2016; Rao and Wang 2016). Previous research has also shown that consumers form general perceptions of a restaurant's healthfulness, largely based on promotion and prior consumption experiences. In turn, perceptions of healthfulness, or "health halos," bias consumers' evaluations of objective product qualities (Chandon and Wansink 2007; Howlett et al. 2009); similar effects have been found for perceptions of product category healthfulness (Burton et al. 2015). Therefore, although many prior studies have examined how health claims and perceptions can influence product-related outcomes, relatively few studies have focused on the influence of perceived healthfulness on firm-related outcomes. Drawing from this prior research, I expect that a restaurant's perceived healthfulness will positively influence perceptions of a restaurant's concern for the well-being of its customers. Consistent with the rationale offered above, and as shown in Figure 2.1, perceived concern for customers' well-being should positively extend to attitudes toward the restaurant and patronage intentions.

Beyond the positive direct effects of voluntary menu calorie labeling and restaurant healthfulness on consumers' perceptions of a restaurant's concern, it is anticipated that menu calorie labeling and a restaurant's perceived healthfulness will interact to affect consumers' perceptions of restaurant concern (see Figure 2.1). Specifically, the provision of calorie information is likely to be relatively unexpected when consumers do not perceive a restaurant to be especially healthful. In contrast, the provision of calorie information is likely to be more strongly anticipated when consumers already perceive a restaurant to be healthful. This suggests a reduced impact of voluntary calorie disclosure on consumers' perception of restaurant concern when the restaurant is already considered to be healthful because this behavior is more strongly expected from more, versus less, health-oriented restaurants. That is, when a restaurant is perceived to be healthful, the favorable effect of menu calorie labeling on consumers' perceptions of restaurant concern should be attenuated. Consistent with this proposed interaction, the positive mediation effect of menu calorie labeling on attitudes toward the restaurant and patronage intentions through perceptions of restaurant concern for the well-being of its customers should also be conditional on the restaurant's perceived healthfulness (Hayes 2013). Specifically, the mediation effects should be attenuated when the restaurant is perceived as more (versus less) healthful. These formal predictions related to the direct and moderating influences of a restaurant's perceived healthfulness on retailer-related outcomes are provided in H4–H6 below.

- H4: The perceived healthfulness of a restaurant is positively related to consumers' perceptions of the restaurant's concern for its customers' well-being.

- H5: The positive influences of the perceived healthfulness of a restaurant on consumers' (a) attitudes toward the restaurant and (b) patronage intentions are mediated by perceptions of the restaurant's concern for its customers' well-being.
- H6a: The positive effect of menu calorie labeling on consumers' perceptions of the restaurant's concern for its customers' well-being is attenuated when the restaurant is perceived as more healthful.
- H6b: The positive mediation effects of menu calorie labeling on (1) attitudes toward the restaurant and (2) patronage intentions through consumers' perceptions of the restaurant's concern for its customers' well-being will be attenuated when the restaurant is perceived as more healthful.

Drawing from activation theories of semantic memory (Anderson 1983; Brucks and Mitchell 1981) and prior research on the effects of health halos (Andrews, Netemeyer, and Burton 1998; Chandon and Wansink 2007), it is anticipated that consumers' perceptions of the retailers' concern for the well-being of its customers also will positively extend to expectations regarding attributes related to the restaurant retailer. Consumers often draw inferences about missing attributes based on limited information (Ross and Creyer 1992) and this may lead to overgeneralizations about specific attributes (Andrews, Burton, and Netemeyer 2000; Andrews, Netemeyer, and Burton 1998; Balasubramanian and Cole 2002; Chandon and Wansink 2007; Garretson and Burton 2000; Keller et al. 1997; Kozup, Creyer, and Burton 2003; Moorman 1996; Wansink 2003). Drawing from this prior research, if a restaurant is perceived to be concerned about its customers' well-being, consumers will be more likely also to have favorable expectations about other associated attributes within their semantic memory networks (e.g., trustworthiness of management, concern for food safety, cleanliness). For example, it seems

likely that positive beliefs about a restaurant's concern for its customers are associated with positive beliefs about the firm's trustworthiness and be concerned about food safety. Therefore, as shown in Figure 2.1, the restaurant's perceived concern for its customers will mediate the influence of menu calorie labeling on expectations of other important retailer-related attributes. However, these positive indirect effects are moderated by consumers' perceived healthfulness of the restaurant. The formal prediction related to the conditional mediation effects extending to expectations of retailer-related attributes is offered in H7.

H7a: The positive effect of menu calorie labeling on consumers' consumers' expectations of retailer-related attributes is mediated by perceptions of the restaurant's concern for its customers' well-being.

H7b: The positive mediation effect of menu calorie labeling on consumers' expectations of retailer-related attributes through consumers' perceptions of the restaurant's concern for its customers' well-being will be attenuated when the restaurant is perceived as more healthful.

Study 1

Method

Design and procedure. Study 1 was a single-factor, between-subjects experiment with two conditions (menu calorie labeling: menu calorie labeling *absent* versus menu calorie labeling *present*) designed to examine the effects of menu calorie labeling on consumers' retailer-related responses. Participants were asked to imagine that they were dining at a restaurant for an evening meal on an ordinary day. They were then randomly assigned to one of two menu conditions

(with or without calorie labeling; see Appendix 2.1). The specific menu items and calorie levels were obtained from prior research (Parker and Lehmann 2014). All other information, including descriptions of the food and menu layout, was held constant across the two conditions. After viewing the menu, participants responded to the dependent measures, manipulation check items, and the demographic questions.

Sample. The sample was comprised of 89 adult participants obtained using Amazon's Mechanical Turk (MTurk). Participants' mean age was 37.8 (SD = 13.1), and 61% (39%) of the participants were female (male). The sample had a median household income of \$50,000 – \$59,999, and 52% of the sample had obtained a four-year college degree.

Measures. Patronage intentions, attitudes toward the restaurant, and consumers' perceptions of the restaurant's concern for its customers' well-being were assessed using measures drawn or adapted from prior research. Patronage intentions (Newman, Howlett, and Burton 2014) were assessed using two seven-point items adapted from prior research: "How likely are you to eat at The River Café based upon the information you viewed on the menu?" with endpoints of "very unlikely/very likely" and "not at all probable/very probable" ($r = .95; p < .001$). Attitude toward the restaurant (Kozup, Creyer, and Burton 2003) was also measured with two seven-point items adapted from prior research: "Based on the information provided on the menu, my attitude toward The River Café is:" with endpoints of "unfavorable/favorable" and "bad/good" ($r = .95; p < .001$). Finally, perceptions of retailer concern for its customers' well-being (Newman, Howlett, and Burton 2014) were assessed with two seven-point items: "After viewing the menu, I believe that The River Café is concerned about the well-being of its

customers” with endpoints of “strongly disagree/strongly agree” and “not at all/very much so” ($r = .94; p < .001$).¹

Results

Awareness check. To verify participants’ awareness of the presence of calorie information in the menu calorie labeling condition, participants in both conditions were asked: “Did the menu you viewed contain calorie information?” with endpoints of “definitely no/definitely yes” (seven-point scale). The result of an independent-samples t-test revealed that participants provided with calorie information on the menu indicated greater awareness of the information ($M = 6.74, SD = 1.08$) than participants *not* provided with calorie information on the menu ($M = 1.96, SD = 1.47; t(87) = 17.56, p < .001$).

Effects on perceptions of restaurant concern for customers’ well-being. As an initial examination of the effect of menu calorie labeling on consumers’ perceptions of a restaurant’s concern for its customers’ well-being (H1), an independent-samples t-test was performed. Results reveal a significant effect of menu calorie labeling on perceptions of restaurant concern ($t(87) = 2.49, p < .05$). As shown in Figure 2.2, perceived concern for the customers’ well-being is higher when calories are disclosed on a restaurant menu.

Indirect effects on attitudes toward the restaurant and patronage intentions. Given these results and the mediation effects predicted in H2, tests of the indirect effects of calorie labeling on consumers’ (1) attitudes toward the restaurant and (2) patronage intentions, through the mediator of perceived restaurant concern, were conducted using Model 4 of PROCESS with

¹ Discriminant validity among perceived concern that the restaurant has for its customers, attitude toward the restaurant, and patronage intention was assessed. Supporting discriminant validity, the AVE exceeded the square of the correlation for each pair of measures (Fornell and Larcker 1981).

10,000 bootstrap samples (Hayes 2013). Figure 2.3 shows the results of these tests of mediation for the two outcome variables. As shown in Figure 2.3, the positive indirect effects of menu calorie labeling on attitude toward the restaurant and patronage intentions were significant (i.e., the 95% bias-corrected bootstrap confidence intervals did not contain a value of zero). These significant indirect effects occur because menu calorie labeling increases the restaurant's perceived concern for its customers (H1 supported), which positively extends to both attitudes toward the restaurant ($b = .49$, $t(86) = 5.11$, $p < .001$) and patronage intentions ($b = .51$, $t(86) = 4.50$, $p < .001$). These results of the mediation tests for the effects of menu calorie labeling on attitudes toward the restaurant and patronage intentions through perceptions of restaurant concern provide support for H2.

Discussion

These findings indicate there are some benefits for restaurants that disclose calorie information to their consumers. Supporting both H1 and H2, Study 1 findings indicate that menu calorie labeling has a positive direct effect on consumers' perceptions of the restaurant's concern for the well-being of customers and a positive *indirect* effect on consumers' attitudes toward the restaurant and patronage intentions. However, based on the discounting principle of attribution theory (Folkes 1988; Kelley 1973), these effects are likely to be stronger when the act of calorie labeling can be directly attributed to the retailer. Therefore, if consumers are informed that a restaurant is providing calorie information only because they are required to do so, the positive effects of menu calorie labeling should be attenuated. To examine the effects predicted in H3, Study 2 extends the design of Study 1 to include a third condition in which calorie information is provided by the restaurant, but it is disclosed to consumers that the restaurant is required to provide this information.

Study 2

Method

Design and procedure. Study 2 was a single-factor between-subjects experiment with three conditions (menu calorie labeling: menu calorie labeling *absent*, voluntary menu calorie labeling *present*, and mandatory menu calorie labeling *present*) designed to examine the effects of voluntary and mandatory calorie disclosure on consumers' restaurant perceptions, restaurant attitudes, and patronage intentions (H3). Similar to prior research (Berry, Burton, and Howlett 2017; Berry et al. 2015; Howlett et al. 2012), participants were randomly assigned to read one of two fictitious news articles. Specifically, participants in the mandatory menu calorie labeling condition read an article briefly explaining that a (fictitious) restaurant named The River Café is now providing calorie information on their menus because the FDA now requires menu calorie labeling at restaurants with 20 or more locations. In contrast, participants in the control condition and the voluntary menu calorie labeling condition read an unrelated article about identity theft (Berry et al. 2015; see Appendix 2.2).

After reading the article, participants completed an unrelated filler task. Following the procedure used in Study 1, participants were then asked to imagine that they were dining at a restaurant for an evening meal on an ordinary day. They were then presented with one of two menus for a fictitious restaurant (River Café) based on their assigned condition (see Appendix 2.1). The calorie information was provided for the menu items in both menu calorie labeling conditions (Parker and Lehmann 2014), but all other information was held constant across the three experimental conditions. After viewing the restaurant menu, participants responded to the dependent measures, awareness and manipulation check items, and demographic questions.

Sample and measures. A national sample of 116 adult participants was obtained using Amazon's MTurk. Participants' mean age was 40.1 (SD = 13.4), and 62% (38%) of the participants were female (male). The sample had a median household income of \$50,000 – \$59,999 and 62% of the sample had obtained a four-year college degree. Patronage intentions ($r = .94$), attitudes toward the restaurant ($r = .95$), and consumers' perceptions that the restaurant was concerned about the well-being of its customers ($r = .96$) were assessed using the same multi-item measures used in Study 1.⁷

Results

Awareness and manipulation checks. To verify participants' awareness of the provision of calorie information in the two menu calorie labeling conditions, participants across conditions were asked: "Did the menu you viewed contain calorie information?" with endpoints of "definitely no/definitely yes" (seven-point scale). One-way analysis of variance (ANOVA) indicated a significant difference in awareness across conditions ($F(2, 113) = 350.46, p < .001$). The means and standard deviations for this awareness check across conditions are shown in Table 2.1. As shown in Table 2.1, follow-up contrasts revealed that participants provided with calorie information on the menu indicated greater awareness of the information (M 's ranged from 6.79 to 6.95) than participants not provided with calorie information on the menu ($M = 1.73; p$'s < 001 for both).

Furthermore, to examine whether the news article presented in the mandatory menu calorie labeling condition was effective in manipulating participants' understanding that the restaurant was providing calorie information because they were required to do so, two seven-

⁷ Discriminant validity among perceived concern that the restaurant has for its customers, attitude toward the restaurant, and patronage intention was again supported (Fornell and Larcker 1981).

point items were used: (1) “This restaurant voluntarily provides calorie information on their menu” with endpoints of “strongly disagree/strongly agree” and (2) “The Food and Drug Administration mandates that this restaurant provide calorie information on their menu” with endpoints of “strongly disagree/strongly agree.” One-way ANOVA results reveal significant differences across the conditions for both manipulation checks ($F(2, 113)$'s ranged from 51.30 to 64.49, p 's $< .001$ for both). As shown in Table 2.1, participants in the voluntary menu calorie labeling condition (i.e., those presented with calorie information on the menu without having read an article about menu calorie labeling being mandatory) believed that this was a voluntary action ($M = 6.26$), relative to the mandatory menu calorie labeling condition ($M = 3.70$; $p < .001$). In contrast, the news article indicating that the FDA requires the restaurant to provide calorie information increased participants' understanding that providing this information was mandatory, such that the mean in this condition ($M = 6.53$) was significantly greater than the other two conditions (M 's ranged from 3.15 to 3.19; p 's $< .001$ for both).

Effects on perceptions of restaurant concern for customers' well-being. To further examine the effect of menu calorie labeling on consumers' perceptions of restaurant concern for its customers' well-being (H1) and determine if this effect is attenuated when the provision of information is mandatory (H3), a one-way ANOVA was used. Results revealed a significant effect of menu calorie labeling on perceived restaurant concern ($F(2, 113) = 3.31, p < .05$). Planned contrasts were conducted to compare each of the menu calorie labeling conditions to the no menu calorie labeling control condition. These results are shown in Figure 2.4. The voluntary provision of calorie information on the restaurant menu resulted in an increase in perceptions that the restaurant was concerned about its customers' well-being ($M = 5.69$; $p < .05$). However, when the provision of calorie information on the restaurant menu was *mandatory* ($M = 5.10$), it

did *not* result in an increase in perceived restaurant concern, relative to the control ($M = 4.99$; $p < .70$). These results provide additional support for H1 and for H3a.

Indirect effects on attitudes toward the restaurant and patronage intentions. Given the mediating effects offered in H2 and H3, tests for the indirect effects of voluntary and mandatory menu calorie labeling on consumers' attitudes toward the restaurant and patronage intentions through the restaurant's perceived concern for its customers (i.e., mediator) were conducted using Model 4 of PROCESS with 10,000 bootstrap samples (Hayes 2013). Prior to conducting mediation analyses, two predictors were created for each of the menu calorie labeling conditions using indicator coding (Hayes and Preacher 2014). Table 2.2 shows the indirect effects of *each* of the menu calorie labeling conditions, relative to the no menu calorie labeling control condition, on attitudes toward the restaurant and patronage intentions through perceptions of restaurant concern (Hayes and Preacher 2014). As shown in Table 2.2, the positive indirect effects of the *voluntary* menu calorie labeling, relative to the control, on attitude toward the restaurant and patronage intentions was significant (IEs = .40 and .46; the 95% bias-corrected bootstrap confidence intervals (CI) do not contain a value of zero). These significant indirect effects occur because voluntary menu calorie labeling increases the restaurant's perceived concern for its customers (see Figure 2.4). This positive effect extends to both attitudes toward the restaurant ($b = .57$, $t(112) = 7.95$, $p < .001$) and patronage intentions ($b = .65$, $t(112) = 6.79$, $p < .001$). In contrast and as shown in Table 2.2, the indirect effects of *mandatory* menu calorie labeling, relative to the no menu calorie labeling control, were *nonsignificant* (the 95% CIs both contain a zero). These results for the indirect effects of menu calorie labeling provide support for H2 and H3b.

Discussion

The findings indicate that while mandatory menu calorie labeling has no discernable effect on consumers' retailer-related responses, the *voluntary* provision of calorie information has positive effects on consumers' perceptions of a restaurant's concern for its customers, attitudes toward the restaurant, and patronage intentions. This suggests that it may be in the retailer's best interests to voluntarily disclose calorie information. That is, restaurants with fewer than 20 locations may want to register with the FDA and participate in menu calorie labeling because it may have a positive effect on consumers' attitudes and increase store patronage (Grewal and Levy 2007). The findings also offer implications for large retail chains concerned about the potential detrimental effects of menu calorie labeling (Goldman 2015; Roberto, Schwartz, and Brownell 2009; Rudd Center for Food Policy and Obesity 2008; VanEpps et al. 2016). Mandatory labeling did not have a positive effect, nor a negative effect, on consumers' retailer-related responses.

Study 3 extends these findings by examining the relationships between a restaurant's perceived healthfulness, perceptions of concern for the customers' well-being, consumers' attitudes toward the restaurant, and patronage intentions (Grewal and Levy 2007). Drawing from prior research (Andrews, Burton, and Netemeyer 2000; Andrews, Netemeyer, and Burton 1998; Balasubramanian and Cole 2002; Burton, Andrews, and Netemeyer 2000; Chandon and Wansink 2007; Garretson and Burton 2000; Howlett et al. 2009; Keller et al. 1997; Kozup, Creyer, and Burton 2003), I suggest that a restaurant may benefit from being perceived as relatively healthful (H4 and H5). Study 3 tests this prediction using a cross-sectional field study. Beyond examining the potential influence of the perceived healthfulness of a restaurant on retailer-related outcomes, Study 3 also seeks to replicate the relationships between perceived restaurant concern and both

attitudes and intentions in a restaurant field setting and considers customers' intentions to revisit an existing restaurant.

Study 3

Method

Design and procedure. Study 3 was a field study designed to examine the predicted relationships between the restaurant's perceived healthfulness, perceptions of the restaurant's concern for the well-being of its customers, consumers' attitudes toward the restaurant, and consumers' repatronage intentions (H4 and H5). The study was conducted for five days at a table service restaurant in the Southeast. The table service restaurant used in this study does not disclose calorie information on their menus and does not have calorie information available upon request or online. Immediately after placing their order with the server, restaurant patrons were asked to participate in the study in exchange for a coupon to use on their next visit. If they agreed to participate in the study, participants were presented with a printed questionnaire.

Sample. Approximately 67% of the restaurant patrons who visited the restaurant while the study was being conducted agreed to complete the survey. This resulted in a final sample of 109 participants. Participants' mean age was 39.0 years ($SD = 12.8$), and 46% (54%) of the participants were female (male). The sample had a median household income of \$50,000–\$59,999, and 54% of the sample had obtained a four-year college degree. On average, the participants had visited the restaurant 5.0 times in the past six months.

Measures. Repatronage intentions ($r = .98$), attitudes toward the restaurant ($r = .99$), and consumers' perceptions of the restaurants' concern for the well-being of its customers ($r = .98$)

were each measured with the two-item seven-point scales used in the previous studies. Because this was a field study where participants dined at the restaurant, the patronage intention measure from the previous study was slightly modified to assess intentions to revisit the restaurant (i.e., “How likely are you to eat [restaurant name] again based upon the information you viewed on the menu?” with endpoints of “very unlikely/very likely” and “not at all probable/very probable”). The perceived healthfulness of the restaurant was assessed by a seven-point item drawn from extant literature (Chandon and Wansink 2007): “The food served here is healthy” with endpoints of “strongly disagree” and “strongly agree.”⁸

Results

Model 4 of PROCESS with 10,000 bootstrap samples (Hayes 2013) was used to test the relationships proposed in H4 and H5 (see Figure 2.5). Supporting H4, the perceived healthfulness of the restaurant was positively related to perceptions of restaurant concern for customers’ well-being ($b = .53$, $t(107) = 5.76$, $p < .001$). In turn, perceived customer concern positively extended to attitudes toward the restaurant ($b = .32$, $t(106) = 4.41$, $p < .001$) and intentions to repatronize the restaurant ($b = .35$, $t(106) = 4.14$, $p < .001$). Furthermore, formal mediation tests revealed positive and significant indirect effects of (1) perceived restaurant healthfulness \rightarrow perceptions of restaurant concern for customers’ well-being \rightarrow consumers’ attitudes toward the restaurant (Indirect effect (IE) = .17, bias-corrected bootstrap 95% confidence interval (CI) [.08, .30]) and (2) perceived restaurant healthfulness \rightarrow perceptions of restaurant concern for customers’ well-being \rightarrow repatronage intentions (IE = .18, 95% CI [.08,

⁸ Discriminant validity among perceived concern that the restaurant has for its customers, attitude toward the restaurant, and patronage intention was again supported (Fornell and Larcker 1981).

.34]), such that neither of these CIs contained a value of zero. These mediation results for both attitudes toward the restaurant and repatronage intentions provide support for H5.

Discussion

Findings from this cross-sectional field study show that restaurants perceived to be more health-oriented are also perceived to be more concerned about the well-being of their customers which, in turn, has a positive influence on customers' attitudes toward the restaurant and customers' intentions to revisit the restaurant. This finding has important implications for retail brand positioning (Grewal and Levy 2007). More specifically, the results suggest that restaurants may be able to improve consumers' restaurant attitudes and patronage intentions by strengthening the perceived health positioning of the restaurant. Building on the findings from the previous three studies, Study 4 uses a between-subjects field experiment to replicate and extend findings from the prior studies while also considering the potential moderating role of the restaurant's perceived healthfulness on the effects of menu calorie labeling on retailer-related outcomes.

Study 4

Method

Design and procedure. Study 4 was a between-subjects field experiment with two conditions (menu calorie labeling: menu calorie labeling *absent* versus menu calorie labeling *present*) and a measured moderator (i.e., perceived restaurant healthfulness). This restaurant field experiment was conducted for six consecutive days at a fast-casual restaurant located in the Southeast. Throughout the duration of this experiment, objective calorie information was either

provided or not provided on the menus and menu boards on an alternating daily basis. Upon placing their order at the restaurant counter, restaurant patrons were asked to participate in the study in exchange for a coupon to use on their next visit. If they agreed to participate, they responded to several measures pertaining to the restaurant and provided some demographic information.

Sample. Approximately two-thirds (65%) of the restaurant patrons who visited the restaurant while the study was being conducted agreed to participate in the study. This resulted in a final sample of 286 participants. Participants' mean age was 47.8 (SD = 16.7), and 68% (32%) of the participants were female (male). The sample had a median household income of \$70,000–\$79,999, and 56% of the sample had obtained a four-year college degree. On average, the participants had visited the restaurant 2.7 times in the past month.

Measures. Repatronage intentions ($r = .96$), attitudes toward the restaurant ($r = .96$), and consumers' perception of the restaurants' concern for the well-being of customers ($r = .98$) were each measured using the two-item seven-point scales used in the previous studies (e.g., Kozup, Creyer, and Burton 2003).⁹ In addition, after evaluating the restaurant on these dependent measures, participants assessed the restaurant's perceived healthfulness using the same measure used in the previous study (e.g., Chandon and Wansink 2007).

Results

Effects on perceptions of restaurant concern for customers' well-being. To examine the direct and moderating effects of menu calorie labeling and perceived restaurant healthfulness on perceptions of restaurant concern for their customers' well-being, Model 1 of PROCESS with

⁹ Discriminant validity among perceived concern that the restaurant has for its customers, attitude toward the restaurant, and patronage intention was again supported (Fornell and Larcker 1981).

10,000 bootstrap samples was used (Hayes 2013). Specifically, after mean centering the predictors, restaurant concern was regressed on menu calorie labeling (no menu calorie labeling = '0' and menu calorie labeling = '1'), perceived restaurant healthfulness, and the calorie labeling by perceived restaurant healthfulness interaction. Menu calorie labeling ($b = .28$, $t(282) = 2.79$, $p < .01$) and restaurant healthfulness ($b = .57$, $t(282) = 12.18$, $p < .001$) both had positive influences on perceptions of restaurants' concern which again confirms H1 and H4. However, these effects were qualified by the interaction between menu calorie labeling and perceived restaurant healthfulness ($b = -.22$, $t(282) = -2.36$, $p < .05$).

The moderating effect of the restaurant's perceived healthfulness on the relationship between menu calorie labeling and consumers' perceptions of the restaurant's concern for its customers' well-being was further examined using the Johnson–Neyman technique. Specifically, this technique was used to identify regions in perceived healthfulness where the effect of menu calorie labeling on perceptions of restaurant concern was significant (Hayes 2013; Johnson and Neyman 1936). As shown in Figure 2.6, the Johnson–Neyman value for significance ($p < .05$) was 5.92, which is .31 standard deviations above the perceived restaurant healthfulness mean. These results reveal that the positive effect of menu calorie labeling on perceptions of restaurant concern for its customers' well-being was significant when the perceived healthfulness of the restaurant was below the Johnson–Neyman value for significance. These results provide support for H6a.

Conditional indirect effects on attitudes towards the restaurant and repatronage intentions. To test the conditional indirect effects of menu calorie labeling on consumers' attitudes toward the restaurant and repatronage intentions through perceptions of restaurant concern (H6b), Model 8 of PROCESS with 10,000 bootstrap samples was used (Hayes 2013).

Supporting H6b, the indices of moderated mediation (Hayes 2013) revealed that menu calorie labeling had a conditional indirect effect on both consumers' attitudes toward the restaurant (Index = $-.08$, bias-corrected bootstrap 95% confidence interval (CI) [$-.18, -.01$]) and repatronage intentions (Index = $-.09$, 95% CI [$-.21, -.01$]). Specifically, when the restaurant was perceived to be relatively unhealthy (one standard deviation below the mean), menu calorie labeling had a significant positive indirect effect on both consumers' attitudes toward the restaurant (Indirect effect (IE) = $.19$, 95% CI [$.06, .37$]) and repatronage intentions (IE = $.21$, 95% CI [$.06, .42$]). However, when the restaurant was perceived to be positioned as healthy (one standard deviation above the mean), these indirect effects became nonsignificant (attitudes toward the restaurant: IE = $.02$, 95% CI [$-.06, .08$]; repatronage intentions: IE = $.02$, 95% CI [$-.07, .09$]). These mediation results provide support for H6b in a restaurant field setting.

Discussion

The findings from this restaurant field experiment indicate that there are some benefits for restaurants that voluntarily choose to disclose calorie information on their menus and menu boards, especially when they are not considered to be particularly healthful. That is, these findings show that voluntary menu calorie labeling has a positive *direct* effect on consumers' perceptions of a restaurant's concern for its customers and a positive *indirect* effect on consumers' attitudes toward the restaurant and intentions to visit the restaurant again in the future. However, these benefits are attenuated if the restaurant is perceived as a more (versus less) healthful restaurant. These findings likely occurred because restaurants positioned as healthy are already perceived to be concerned about the well-being of their customers; the provision of calorie information on menus and menu boards is to be expected. In summary, these findings suggest that it could be in the best interest of restaurants and retail food establishment to

offer calorie information voluntarily, but it seems less critical if they are already perceived to be healthful. Study 5 extends these findings by considering the indirect effects that calorie labeling in restaurant promotion may have on expectations about specific restaurant attributes (H7).

Study 5

Method

Design and procedure. Study 5 was a between-subjects experiment with two conditions (calorie labeling: calorie labeling *absent* versus calorie labeling *present*) and as in the prior studies, the perceived healthfulness of the restaurant was a measured moderator. Participants were randomly assigned to one of the two experimental conditions. Participants first viewed one of the two advertisements for a fictitious restaurant (see Appendix 2.3). When present, the calorie information was provided for three sample menu items. These items and their corresponding calorie contents were obtained from objective information obtained from the website of a large chain restaurant. After viewing one of the two advertisements, participants responded to several measures pertaining to the restaurant and provided some demographic information.

Sample. Predictions were tested using a national sample of 102 adults obtained via Amazon's MTurk. Participants' mean age was 36.3 (SD = 12.2), and 51% (49%) of the participants were female (male). The sample had a median household income of \$40,000–\$49,999, and 50% of the sample had obtained a four-year college degree.

Measures. Patronage intentions ($r = .98$), attitudes toward the restaurant ($r = .88$), the restaurant's perceived concern for its customers' well-being ($r = .96$), and the perceived

healthfulness of the restaurant were assessed using measures similar to those previously used (Chandon and Wansink 2007; Newman, Howlett, and Burton 2014). However, while using the same endpoints, the items were slightly modified to make them appropriate for this context since participants did not actually dine at the restaurant. Correlations between the items again exceeded .90 for each of the multi-item measures.¹⁰ In addition to the measures used in the previous studies, expectations regarding various restaurant attributes were assessed using several seven-point semantic differential scale items. Specifically, based on the information shown in the advertisement, participants rated the restaurant on a scale from “very poor” to “excellent” on the following attributes: quality of food, atmosphere, trustworthiness of management, service, concern for food safety, friendliness of the staff, and cleanliness.

Results

Effects on perceived restaurant concern for its customers' well-being. Model 1 of PROCESS with 10,000 bootstrap samples was again used (Hayes 2013) to further examine the direct and moderating effects of calorie labeling in restaurant promotion and perceived restaurant healthfulness on perceptions of concern for customers' well-being. As in Study 4, after mean centering the predictors, perceptions of restaurant concern for customer well-being was regressed on calorie labeling (calorie labeling *absent* = '0' and calorie labeling *present* = '1'), perceived restaurant healthfulness, and the calorie labeling by perceived restaurant healthfulness interaction. Calorie labeling ($b = .70, t(99) = 3.28, p < .01$) and perceived restaurant healthfulness ($b = .54, t(99) = 6.23, p < .001$) both had positive influences on perceptions of restaurant concern, providing further support for H1 and H4.

¹⁰ Discriminant validity was assessed among perceived restaurant concern and consumers' retailer-related expectations (Fornell and Larcker 1981).

Given the prediction offered in H6, the calorie labeling by perceived restaurant healthfulness interaction was again of focal interest. Although this interaction did not reach significance ($b = -.27$, $t(99) = -1.60$, $p = .11$), the overall pattern of results provides partial support for H6. Specifically, as in the previous study, the calorie labeling and perceived restaurant healthfulness interaction was examined using the Johnson–Neyman technique to identify the regions in which perceived restaurant healthfulness was associated with a significant effect of calorie labeling (Hayes 2013). A plot of these results is shown in Figure 2.7. As shown in Figure 2.7, the Johnson–Neyman value for significance ($p < .05$) was 5.61, which is .60 standard deviations above the perceived restaurant healthfulness mean of 4.86. Results in Figure 2.7 are similar to those of the field study (see Figure 2.6) and provide further support for the positive effect of calorie labeling on perceptions of restaurant concern for customer well-being when the perceived healthfulness of the restaurant is below the Johnson–Neyman value. These results provide additional support H6a.

Conditional indirect effects on restaurant attitude and patronage intentions. As an additional test of the conditional indirect effects of menu calorie labeling and perceived restaurant healthfulness on consumers' attitudes toward the restaurant and intentions to revisit the restaurant (H6b), Model 8 of PROCESS with 10,000 bootstrap samples was again used (Hayes 2013). Providing further support for H6b, menu calorie labeling had a conditional indirect effect on consumers' attitudes toward the restaurant and repatronage intentions. Specifically, when the restaurant was perceived to be relatively unhealthy (one standard deviation below the mean), calorie labeling had a positive indirect effect on both consumers' attitudes toward the restaurant (IE = .61, bias-corrected bootstrap 95% CI [.24, 1.10]) and patronage intentions (IE = .68, 95% CI [.23, 1.34]). However, when the restaurant was perceived

to be relatively healthy (one standard deviation above the mean), these indirect effects became nonsignificant (both 95% CIs contained the value of zero). Thus, these conditional mediation results provide additional support for H6b.

Conditional indirect effects on expectations about restaurant attributes. In addition to the indirect effects of menu calorie labeling on consumers' attitudes toward the restaurant and patronage intentions, the indirect effects of menu calorie labeling on expectations about restaurant attributes will likely be of interest to food retailers as well. To examine these conditional indirect effects mediated by perceptions of restaurant concern for customer well-being (H7), Model 8 of PROCESS with 10,000 bootstrap samples was again used (Hayes 2013). Specifically, each of the attribute expectations was included as the criterion variable in separate conditional mediation models. These conditional indirect effects are shown in Table 2.3. As shown in Table 2.3, when the restaurant was perceived to be relatively unhealthy (one standard deviation below the mean), the provision of calorie information had a positive indirect effect on each of the attribute expectations (i.e., IE's range from .23 to .43; all CIs did not contain a value of zero). However, when the restaurant was perceived by consumers to be relatively healthy (one standard deviation above the mean), the indirect effects of calorie labeling on each of the attribute expectations were nonsignificant (i.e., all IE's range from .08 to .15; all CIs contained a zero).

Discussion

Consistent with Study 4 findings, making calorie information available increased perceptions of restaurant concern for customer well-being when the restaurant was not viewed as healthy, which in turn, positively extends to other retailer-related outcomes (e.g., patronage intentions, attitudes, and attribute expectations). To test the indirect effects of calorie labeling

and perceived restaurant healthfulness on expectations about retailer attributes (H7), this study examined these effects by providing the information in a restaurant's advertising rather than on a menu or menu board. The results from previous studies were replicated, indicating that restaurants and retail food establishments may potentially benefit from providing calorie information in their promotional materials. Findings further show that, when perceptions of restaurant concern for customer well-being is positively influenced by calorie labeling, consumers also make favorable inferences about specific restaurant attributes (e.g., cleaner, deliver higher quality food, offer a better atmosphere and service, be more concerned about food safety).

General Discussion

Larger chain restaurants and many other retail food establishments will soon be required to disclose calorie information on menus and menu boards, while other restaurant establishments not included in the mandate may choose to voluntarily disclose calories (FDA 2014; 2016; 2017). This requirement will affect an estimated 278,000 retailers and initially cost these firms approximately \$315 million (FDA 2014). Many firms opposed this new regulation and argued that menu calorie labeling was too costly to implement. Retailers also worried that the disclosure of calorie information would have a detrimental impact on business (Goldman 2015; Roberto, Schwartz, and Brownell 2009; Rudd Center for Food Policy and Obesity 2008; VanEpps et al. 2016). Given these concerns, and since restaurants with fewer than 20 locations have the option to voluntarily provide calorie information (FDA 2014), this research assesses the effects of the voluntary versus mandatory menu calorie labeling on various outcomes of interest to restaurant

management and retail food establishments. Further, this research considers the direct and moderating effects of the restaurant's perceived healthfulness which has clear implications for retailers considering alternative marketing strategies to increase patronage (Grewal and Levy 2007).

Implications for managers and marketers of restaurants and food retailers

With consumers becoming increasingly concerned about their health and well-being (IFIC 2012; Nielsen 2015; Trivedi 2011), managers and marketers of restaurants and other retail food establishments need to consider the impact of nutrition information provision and health positioning on retailer-related outcomes. This research provides consumer insights to inform restaurant and retail management on potential opportunities by directly examining what happens when restaurants provide one specific type of objective information—calorie information on restaurant menus and menu boards—and by considering the direct and moderating effects of perceived restaurant healthfulness.

While the provision of calorie information will soon be required for some restaurants and food retailers, it is optional for others (FDA 2014; 2016; 2017). Thus, restaurants and food retailers that will be required to provide calorie information and those having the option to provide the information can both benefit from understanding the implications associated with calorie information provision on their menus and menu boards. The findings across studies, including three online and two field experiments, indicate that the provision of calorie information on restaurant menus is positively related to consumers' perceptions of restaurant concern for the well-being of its customers. This effect, in turn, positively extends to attitudes toward the restaurant and both patronage and repatronage intentions. Given the number of restaurants that consumers must choose from when dining out, these mediation effects should be

of great interest to restaurant management. Further, Study 5 results indicate that the positive effects of calorie information provision in restaurant promotion extend to expectations regarding various retailer-related attributes, outcomes extending well beyond the calorie provision itself. These positive effects associated with calorie labeling are consistent with survey findings showing that consumers favor having nutrition information available (Lando and Labiner-Wolfe 2007; Rudd Center for Food Policy and Obesity 2008) and align with findings from prior studies in other contexts indicating that retailers may benefit from the provision of front-of-package and point-of-purchase nutrition information (Achabal et al. 1987; Newman, Howlett, and Burton 2014).

Although menu calorie labeling resulted in positive direct and indirect effects on retailer-related outcomes, the results of Study 2 show that these positive outcomes only occur when menu calorie labeling is voluntary. In other words, if consumers are aware that this information is simply provided by a firm because it is required, the positive effects of the action on retailer evaluations and patronage are eliminated. The overall pattern of findings suggests that managers of establishments *not* required to provide labeling should strongly consider voluntarily providing this information to consumers and emphasize that the action is voluntary. In addition, these findings should still be of interest to larger restaurant chains and other retail food establishments who have expressed concerns that providing this information may have a detrimental impact on sales. Based on Study 2 results, this does not appear to be the case, but this issue certainly warrants additional research.

Beyond the direct effects of voluntary menu calorie labeling established in Studies 1 and 2, findings from Studies 3 and 4 indicate that the perceived healthfulness of a restaurant directly impacts consumers' perceived retailer concern and indirectly influences patronage intentions,

attitudes toward the establishment, and expectations regarding various retailer attributes. For example, findings from Study 3, a restaurant field study that sampled actual restaurant patrons, show that the retailer's perceived healthfulness is positively associated with its customers' evaluation of restaurant concern, restaurant attitude, and intentions to visit the restaurant again in the future. These positive effects of the perceived healthfulness of a restaurant are consistent with the growing demand for healthy products (Cao and Yan 2016; Nielsen 2015; Rao and Wang 2016) and the positive effects associated with health claims in prior literature (e.g., Andrews, Netemeyer, and Burton 1998; Balasubramanian and Cole 2002; Kozup, Creyer, and Burton 2003). Based on the findings from Studies 3 and 4, restaurants clearly benefit from a more health-oriented positioning. Thus, perceived healthfulness and health positioning should be of concern to retail management, and ways to improve the perceived healthfulness of a restaurant or retail food establishment should be strongly considered. Again, given the growing demand for healthy products (e.g., Rao and Wang 2016), similar effects would be anticipated for grocery and other food retailers; however, further research in these contexts is needed to test these relationships across various types of food retailers.

Findings from a restaurant field experiment (Study 4) indicate that the perceived healthfulness of a restaurant also plays a moderating role in the effects of menu calorie labeling on retailer-related outcomes. Specifically, the positive effect of menu calorie labeling on perceptions of restaurant concern is stronger when the restaurant is perceived as *less* healthful. This likely occurs because consumers anticipate that a restaurant viewed as a more healthful alternative is already concerned about their well-being, making the incremental benefit of menu calorie labeling minimal. In contrast, calorie information provision by restaurants *not* perceived as healthful is relatively unanticipated, which increases the perceived benefit of menu calorie

labeling. These moderating effects extend to patronage intentions, attitudes toward restaurants, and expectations about a variety of restaurant attributes, such that the favorable effects of menu calorie labeling on these outcomes are attenuated for restaurants perceived as more healthful.

Implications for theory and extant literature

These findings contribute to a growing body of attribution theory literature in a retail context, a smaller body of literature that examines the effects of nutrition information provision on retailer-related outcomes, and literature that examines health halos associated with health-related claims on product packaging. Attribution theory has been applied as a framework to understand many retail phenomena (e.g., Cheema and Patrick 2008; Ellen, Mohr, and Webb 2000; Forehand and Grier 2003; Puccinelli et al. 2009). The current research from Essay 2 extends these prior findings by demonstrating how calorie information that is voluntarily provided by retail restaurant establishments leads to attributions that the firm is concerned about consumers' well-being. The effect on perceived concern, in turn, has a positive influence on restaurant attitudes and patronage intentions. However, supporting the discounting principle of attribution theory in this specific context (Folkes 1988; Kelley 1973), these positive effects are shown to diminish if this action of providing consumers with additional information cannot be attributed directly to the retailer.

Prior retailing research has called for studies examining how store patronage is influenced by the provision of calorie information on an entire menu (Burton, Howlett, and Tangari 2009). However, to the best of my knowledge, research to date has not addressed this issue. In contrast, research that examines the effects of nutrition information provision, in both a point-of-purchase and a front-of-package context, on attitudes and behavioral intentions is growing (e.g., Achabal et al. 1987; Newman, Howlett, and Burton 2014). Findings from the

studies offered in this essay extend this research by directly testing the discounting principle of attribution theory (Folkes 1988; Kelley 1973) and by considering the moderating role of a restaurant's perceived healthfulness (Chandon and Wansink 2007) for effects of objective information provision. The conceptual framework shown in Figure 2.1, supported by findings across five studies, can be utilized in future research to understand the potential effects of various forms of nutrition information that are either voluntarily or mandatorily provided as regulatory requirements change over time (e.g., sodium content labeling in New York City; National Restaurant Association 2016).

This research also contributes to the literature examining the effects of health halos (e.g., Andrews, Netemeyer, and Burton 1998) on attitudes and behavioral intentions. Generally, prior studies have examined the effects of health halos based on health claims presented on packages or in advertising and considered how these halos impact outcomes directly related to the product (e.g., perceived product healthfulness, overall attitudes toward the product, and behavioral intentions). Chandon and Wansink (2007) considered health halos formed from restaurant positioning, but they examined the impact of these halos on calorie estimations. The findings from Studies 3 and 4 contribute to this body of research by demonstrating that the perceived healthfulness of a restaurant, conceptually similar to a health halo, is positively associated with broad outcomes such as perceptions of restaurant concern for customers' well-being, expectations about restaurant attributes, restaurant attitudes, and patronage intentions. Thus, these findings suggest that consumers potentially may overgeneralize from the perceived healthfulness of a restaurant or retail food establishment (c.f., Andrews, Netemeyer, and Burton 1998).

Limitations and future research

The five studies in this essay included two field studies conducted at two different restaurant establishments, five separate adult samples (i.e., three national convenience samples and two site intercept samples), and experimental stimuli that included calorie information presented on actual menus and menu boards, fictitious menus, and restaurant promotion. However, there are several limitations and avenues for future research that should be considered. For example, Study 1 findings show that when consumers are aware that calorie information is being provided by a restaurant involuntarily, the beneficial effects of information provision diminish. This information was presented to participants in the form of a news article that participants were asked to read. However, once menu calorie labeling becomes mandatory for chain restaurants and other retail food establishments, it is not clear how long it may take consumers to realize that this action is mandatory for large chains. In addition, as consumers become accustomed to having calorie information available at chain restaurants, does this increase their expectation to have the information available at all restaurants, even when the firm is *not* required to disclose this information? These shifts in expectations due to a change in the information environment could impact retailer-related outcomes, and this issue warrants future research.

This research focused on a specific type of nutrition information provision—numeric calorie information provision on restaurant menus and menu boards. While the formats are consistent with FDA requirements, other research has begun to consider alternative presentation formats for menu calorie labeling (Ellison, Lusk, and Davis 2014; VanEpps, Downs, and Loewenstein 2016a; 2016b). Future research should examine whether the beneficial effects of voluntary calorie information provision are consistent across presentation formats (c.f., Newman,

Howlett, and Burton 2014). Further, some information labeling mandates across the country are beginning to extend beyond calorie information requirements. For example, the New York City Board of Health now requires restaurant chains with more than 15 locations nationally to post a salt-shaker label next to menu items that are high in sodium (NRA 2016). Given that consumers are becoming increasingly concerned about their health (IFIC 2012; Nielsen 2015; Trivedi 2011), other forms of nutrition information provision may also have positive effects on retailer-related outcomes. Therefore, to provide insight for the management of retail food establishments, future research could consider the potential implications of other forms of nutrition information provision. It would also be worth examining whether the benefit of providing other nutrition information, in addition to calories, is additive and incremental and if there are limitations to such benefits.

Since restaurants and other retail food establishments with 20 or more locations will soon be required to provide calorie information on menus and menu boards (FDA 2014; 2016; 2017), there are many avenues for future research that can provide marketing managers with important strategic insights. For example, should a menu be modified if the restaurant is concerned about the number of calories in their meals (Berman and Lavizzo-Mourey 2008; Roberto, Schwartz, and Brownell 2009)? Further, will these potential changes in product offerings vary based on the health positioning of the retailer (Chandon and Wansink 2007)? Given the positive influence of menu calorie labeling on retailer-related outcomes, there are many questions that arise from these findings regarding the potential impact of objective information provision on consumer patronage (Grewal and Levy 2007). Specifically, how does the provision of calorie information on menus and menu boards affect dining frequency across restaurant brands and types of restaurants? Drawing from the findings from these studies, some consumers may be less likely to

dine at restaurants that do not disclose calories and increase their dining frequency at restaurants that choose to voluntarily disclose calories.

Conclusion

Based on the findings from these five studies, including two field studies conducted in restaurant settings, calorie information provision on restaurant menus appears to have beneficial effects on consumers' perceptions that a given restaurant is concerned about its customers' well-being, attitudes toward the restaurant, and intentions to patronize the restaurant. However, these beneficial effects are attenuated when a restaurant is perceived to be more (versus less) healthful and when calorie disclosure is mandatory rather than voluntary. These findings indicate that there are clear benefits for restaurant marketers that voluntarily provide consumers with calorie information on their menus or are positioned and perceived as more healthful food establishments.

References

- Achabal, Dale D., Shelby H. McIntyre, Cheryl H. Bell, and Nancy Tucker (1987), "The Effect of Nutrition P-O-P Signs on Consumer Attitudes and Behavior," *Journal of Retailing*, 63 (1), 9–25.
- Anderson, John Robert (1983), *The Architecture of Cognition*. Cambridge, MA: Harvard University Press.
- Andrews, J. Craig, Scot Burton, and Jeremy Kees (2011), "Is Simpler Always Better? Consumer Evaluations of Front-of-Package Nutrition Symbols," *Journal of Public Policy & Marketing*, 30 (2), 175–190.
- Andrews, J. Craig, Scot Burton, and Richard G. Netemeyer (2000), "Are Some Comparative Nutrition Claims Misleading? The Role of Nutrition Knowledge, Ad Claim Type and Disclosure Conditions," *Journal of Advertising*, 29 (3), 29–42.
- Andrews, J. Craig, Richard G. Netemeyer, and Scot Burton (1998), "Consumer Generalization of Nutrient Content Claims in Advertising," *Journal of Marketing*, 62 (4), 62–75.
- Balasubramanian, Siva K. and Catherine Cole (2002), "Consumers' Search and Use of Nutrition Information: The Challenge and Promise of the Nutrition Labeling Act," *Journal of Marketing*, 66 (3), 112–127.
- Bassett, Mary T., Tamara Dumanovsky, Christina Huang, Lynn D. Silver, Candace Young, Cathy Nonas, Thomas D. Matte, Sekai Chideya, and Thomas Frieden (2008), "Purchasing Behavior and Calorie Information at Fast-Food Chains in New York City, 2007," *American Journal of Public Health*, 98 (8), 1457–1459.
- Berman, Mark and Risa Lavizzo-Mourey (2008), "Obesity Prevention in the Information Age: Caloric Information at the Point of Purchase," *Journal of the American Medical Association*, 300 (4), 433–435.
- Berry, Christopher, Amaradri Mukherjee, Scot Burton, and Elizabeth Howlett (2015), "A COOL Effect: The Direct and Indirect Impact of Country-of-Origin Disclosures on Purchase Intentions for Retail Food Products," *Journal of Retailing*, 91 (3), 533–542.
- Berry, Christopher, Scot Burton, and Elizabeth Howlett (2017), "It's Only Natural: The Mediating Impact of Consumers' Attribute Inferences on the Relationships Between Product Claims, Perceived Product Healthfulness, and Purchase Intentions," *Journal of the Academy of Marketing Science*, forthcoming.
- Brucks, Merrie and Andrew Mitchell (1981), "Knowledge Structures, Production Systems and Decision Strategies," in *NA – Advances in Consumer Research*, Vol. 8, Kent Monroe, ed. Ann Arbor, MI: Association for Consumer Research, 750–757.

- Burton, Scot and Elizabeth H. Creyer (2004), "What Consumers Don't Know Can Hurt them: Consumer Evaluations and Disease Risk Perceptions of Restaurant Menu Items," *Journal of Consumer Affairs*, 38 (1), 121–145.
- Burton, Scot, Elizabeth H. Creyer, Jeremy Kees, and Kyle Huggins (2006), "Attacking the Obesity Epidemic: The Potential Health Benefits of Providing Nutrition Information in Restaurants," *American Journal of Public Health*, 96 (9), 1669–1675.
- Burton, Scot, Elizabeth Howlett, and Andrea Heintz Tangari (2009), "Food for Thought: How Will the Nutrition Labeling of Quick Service Menu Items Influence Consumers' Product Evaluations, Purchase Intentions, and Choices?," *Journal of Retailing*, 85 (3), 258–273.
- Burton, Scot, J. Craig Andrews, and Richard G. Netemeyer (2000), "Nutrition Ad Claims and Disclosures: Interaction and Mediation Effects for Consumer Evaluations of the Brand and the Ad," *Marketing Letters*, 11 (3), 235–247.
- Burton, Scot, Laurel Aynne Cook, Elizabeth Howlett, and Christopher Newman (2015), "Broken Halos and Shattered Horns: Overcoming the Biasing Effects of Prior Expectations Through Objective Information Disclosure," *Journal of the Academy of Marketing Science*, 43 (2), 240–256.
- Cao, Zixia and Ruiliang Yan (2016), "Health Creates Wealth? The Use of Nutrition Claims and Firm Financial Performance," *Journal of Public Policy & Marketing*, 35(1), 58–75.
- Centers for Disease Control and Prevention (CDC) (2017), "Nutrition, Physical Activity and Obesity: Data, Trends and Maps," (accessed February 6, 2017), [available at <http://www.cdc.gov/nccdphp/DNPAO/index.html>].
- Chandon, Pierre and Brian Wansink (2007), "The Biasing Health Halos of Fast-Food Restaurant Health Claims: Lower Calorie Estimates and Higher Side Dish Consumption Intentions," *Journal of Consumer Research*, 34 (3), 301–314.
- Cheema, Amar and Vanessa M. Patrick (2008), "Anytime Versus Only: Mind-Sets Moderate the Effect of Expansive Versus Restrictive Frames on Promotion Evaluation," *Journal of Marketing Research*, 45 (4), 462–472.
- Cialdini, Robert B. (1993), *Influence: Science and Practice*, New York: Harper Collins.
- Downs, Julie S., Jessica Wisdom, Brian Wansink, and George Loewenstein (2013), "Supplementing Menu Labeling with Calorie Recommendations to Test for Facilitation Effects," *American Journal of Public Health*, 103 (9), 1604–1609.
- Economic Research Service (ERS), United States Department of Agriculture (USDA) (2017), "Food Expenditures," (accessed February 6, 2017), [available at <http://www.ers.usda.gov/data-products/food-expenditures.aspx>].
- Ellen, Pam Scholder, Lois A. Mohr, and Deborah J. Webb (2000), "Charitable Programs and the Retailer: Do They Mix?," *Journal of Retailing*, 76 (3), 393–406.

- Ellison, Brenna, Jayson L. Lusk, and David Davis (2014), "The Effect of Calorie Labels on Caloric Intake and Restaurant Revenue: Evidence from Two Full-Service Restaurants," *Journal of Agricultural and Applied Economics*, 46 (2), 173–191.
- Folkes, Valerie S. (1988), "Recent Attribution Research in Consumer Behavior: A Review and New Directions," *Journal of Consumer Research*, 14 (4), 548–565.
- Food and Drug Administration (FDA) (2016), "A Labeling Guide for Restaurants and Retail Establishments Selling Away-From-Home Foods-Part II (Menu Labeling Requirements in Accordance with the Patient Protection Affordable Care Act of 2010); Guidance for Industry; Availability," *Federal Register*, 81 (87), 27067–27068.
- Food and Drug Administration (FDA) (2014), "Food Labeling; Nutrition Labeling of Standard Menu Items in Restaurants and Similar Retail Food Establishments," *Federal Register*, 79 (230), 71155–71259.
- Food and Drug Administration (FDA) (2017), "Food Labeling; Nutrition Labeling of Standard Menu Items in Restaurants and Similar Retail Food Establishments; Extension of Compliance Date; Request for Comments," *Federal Register*, 82 (85), 20825–20829.
- Food and Drug Administration (FDA) (1993), "Food Labeling Regulations: Implementing the Nutrition Labeling and Education Act of 1990; Opportunity for Comments," *Federal Register*, 58 (3), 2066–2941.
- Forehand, Mark R. and Sonya Grier (2003), "When Is Honesty the Best Policy? The Effect of Stated Company Intent on Consumer Skepticism," *Journal of Consumer Psychology*, 13 (3), 349–356.
- Fornell, Claes and David F. Larcker (1981), "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research*, 18 (1), 39–50.
- Friestad, Marian and Peter Wright (1994), "The Persuasion Knowledge Model: How People Cope with Persuasion Attempts," *Journal of Consumer Research*, 21 (1), 1–31.
- Garretson, Judith and Scot Burton (2000), "The Nutrition Facts Panel and Package Claims: The Role of Nutrient Values, Multiple Claims, and Congruent Information on Attitudes, Disease-Related Risks, and Consumer Trust," *Journal of Public Policy & Marketing*, 19 (2), 213–227.
- Goldman, T.R. (2015), "The FDA's Menu-Labeling Rule. Many Restaurants Will Soon Be Required to List the Calorie Count of the Food They Sell," *Health Affairs*, (accessed February 6, 2017), [available at http://healthaffairs.org/healthpolicybriefs/brief_pdfs/healthpolicybrief_140.pdf].
- Grewal, Dhruv and Michael Levy (2007), "Retailing Research: Past, Present, and Future," *Journal of Retailing*, 83 (4), 447–464.

- Guthrie, Joanne F., Biing-Hwan Lin, and Elizabeth Frazão (2002), "Role of Food Prepared Away from Home in the American Diet, 1977–78 versus 1994–96: Changes and Consequences," *Journal of Nutrition Education and Behavior*, 34 (3), 140–150.
- Haws, Kelly L. and Peggy J. Liu (2016), "Half-Size Me? How Calorie and Price Information Influence Ordering on Restaurant Menus with Both Half and Full Entrée Portion Sizes," *Appetite*, 97 (1), 127–137.
- Hayes, Andrew F. (2013), *Introduction to Mediation, Moderation, and Conditional Process Analysis*. T. D. Little, ed. New York: The Guilford Press.
- Hayes, Andrew F. and Kristopher J. Preacher (2014), "Statistical Mediation Analysis with a Multicategorical Independent Variable," *British Journal of Mathematical and Statistical Psychology*, 67 (3), 451–470.
- Heider, Fritz (1958), *The Psychology of Interpersonal Relations*, New York: Wiley.
- Howlett, Elizabeth A., Scot Burton, Kenneth Bates, and Kyle Huggins (2009), "Coming to a Restaurant Near You? Potential Consumer Responses to Nutrition Information Disclosure on Menus," *Journal of Consumer Research*, 36 (3), 494–503.
- Howlett, Elizabeth, Scot Burton, Andrea Heintz Tangari, and My Bui (2012), "Hold the Salt! Effects of Sodium Information Provision, Sodium Content, and Hypertension on Perceived Cardiovascular Disease Risk and Purchase Intentions," *Journal of Public Policy & Marketing*, 31 (1), 4–18.
- International Food Information council (IFIC) (2012), "2012 Food & Health Survey: Consumer Attitudes Toward Food Safety, Nutrition & Health," (accessed February 7, 2017), [available at http://www.foodinsight.org/2012_Food_Health_Survey_Consumer_Attitudes_toward_Food_Safety_Nutrition_and_Health].
- Johnson, Palmer Oliver and Jerzy Neyman (1936), "Tests of Certain Linear Hypotheses and Their Application to Some Educational Problems," *Statistical Research Memoirs*, 1, 57–93.
- Jones, Edward E. and Keith E. Davis (1965), "From Acts to Dispositions: The Attribution Process in Person Perception," in *Advances in Experimental Social Psychology*, Vol. 2, L. Berkowitz, ed. Durham, NC: Duke University, 219–266.
- Keller, Scott B., Mike Landry, Jeanne Olson, Anne M. Velliquette, Scot Burton, and J. Craig Andrews (1997), "The Effects of Nutrition Package Claims, Nutrition Facts Panels, and Motivation to Process Nutrition Information on Consumer Product Evaluations," *Journal of Public Policy & Marketing*, 16 (2), 256–269.
- Kelley, Harold H. (1973), "The Processes of Causal Attribution," *American Psychologist*, 28 (2), 107–128.

- Kelley, Harold H. (1967), "Attribution Theory in Social Psychology," *Nebraska Symposium on Motivation*, 15, 192–238.
- Kozup, John C., Elizabeth H. Creyer, and Scot Burton (2003), "Making Healthful Food Choices: The Influence of Health Claims and Nutrition Information on Consumers' Evaluations of Packaged Food Products and Restaurant Menu Items," *Journal of Marketing*, 67 (2), 19–34.
- Lando, Amy M. and Judith Labiner-Wolfe (2007), "Helping Consumers Make More Healthful Food Choices: Consumer Views on Modifying Food Labels and Providing Point-of-Purchase Nutrition Information at Quick-service Restaurants," *Journal of Nutrition Education and Behavior*, 39 (3), 157–163.
- Lin, Biing-Hwan, Joanne Guthrie, and Elizabeth Frazão (1999), "Nutrition Contribution of Food Away from Home," *America's Eating Habits: Changes and Consequences*, 213–242.
- Long, Michael W., Deirdre K. Tobias, Angie L. Craddock, Holly Batchelder, and Steven L. Gortmaker (2015), "Systematic Review and Meta-Analysis of the Impact of Restaurant Menu Calorie Labeling," *American Journal of Public Health*, 105 (5), 11–24.
- Moorman, Christine (1996), "A Quasi Experiment to Assess the Consumer and Informational Determinants of Nutrition Information," *Journal of Public Policy and Marketing*, 15 (1), 28–44.
- Morales, Andrea C. (2005), "Giving Firms an "E" for Effort: Consumer Responses to High-Effort Firms," *Journal of Consumer Research*, 31 (4), 806–812.
- National Restaurant Association (2016), "Judge Rules for Sodium Labeling in New York City," (accessed February 9, 2017), [available at <http://www.restaurant.org/News-Research/News/Judge-rules-for-sodium-labeling-in-NYC>].
- Nestle, Marion (2003), "Increasing Portion Sizes in American Diets: More Calories, More Obesity," *Journal of the Academy of Nutrition and Dietetics*, 103 (1), 39–40.
- Newman, Christopher, Elizabeth Howlett, and Scot Burton (2014), "Shopper Response to Front-of-Package Nutrition Labeling Programs: Potential Consumer and Retail Store Benefits," *Journal of Retailing*, 90 (1), 13–26.
- Nielsen (2015), "We Are What We Eat: Healthy Eating Trends Around the World," (accessed February 7, 2017), [available at <http://www.nielsen.com/content/dam/nielsen-global/eu/nielseninsights/pdfs/Nielsen%20Global%20Health%20and%20Wellness%20Report%20-%20January%202015.pdf>].
- Pan, Yue and George M. Zinkhan (2006), "Determinants of Retail Patronage: A Meta-Analytical Perspective," *Journal of Retailing*, 82 (3) 229–243.

- Parker, Jeffrey and Donald R. Lehmann (2014), “How and When Grouping Low-Calorie Options Reduces the Benefits of Providing Dish-Specific Calorie Information,” *Journal of Consumer Research*, 6 (1), 213–235.
- Pomeranz, Jennifer L. and Kelly D. Brownell (2008), “Legal and Public Health Considerations Affecting the Success, Reach, and Impact of Menu-Labeling Laws,” *American Journal of Public Health*, 98 (9), 1578–1583.
- Puccinelli, Nancy M., Ronald C. Goodstein, Dhruv Grewal, Robert Price, Priya Raghuram, and David Stewart (2009), “Customer Experience Management in Retailing: Understanding the Buying Process,” *Journal of Retailing*, 85 (1), 15–30.
- Rao, Anita and Emily Yucai Wang (2016), “Demand for ‘Healthy’ Products: The Impact of False Claims,” *Kilts Center for Marketing at Chicago Booth – Nielsen Dataset Paper Series 1–019*.
- Roberto, Christina A., Marlene B. Schwartz, and Kelly D. Brownell (2009), “Rationale and Evidence for Menu-Labeling Legislation,” *American Journal of Preventive Medicine*, 37 (6), 546–551.
- Ross, William T. and Elizabeth H. Creyer (1992), “Making Inferences about Missing Information: The Effects of Existing Information,” *Journal of Consumer Research*, 19 (1), 14–25.
- Rudd Center for Food Policy and Obesity (2008), “Menu Labeling in Chain Restaurants: Opportunities for Public Policy,” (accessed February 5, 2017), [available at <http://www.uconnruddcenter.org/files/Pdfs/RuddMenuLabelingReport2008.pdf>].
- Steinbock, Lena and Robert W. Palmatier (2016), “Understanding Loyalty Program Effectiveness: Managing Target and Bystander Effects,” *Journal of the Academy of Marketing Science*, 44 (1), 88–107.
- Todd, Jessica E., Lisa Mancino, and Biing-Hwan Lin (2010), “The Impact of Food Away from Home on Adult Diet Quality,” *Economic Research Report* (Number 90), (accessed February 6, 2017), [available at https://www.ers.usda.gov/webdocs/publications/err90/8170_err90_1_.pdf].
- Trivedi, Minakshi (2011), “Regional and Categorical Patterns in Consumer Behavior: Revealing Trends,” *Journal of Retailing*, 87 (1), 18–30.
- VanEpps, Eric M., Christina A. Roberto, Sara Park, Christina D. Economos, and Sara N. Bleich (2016), “Restaurant Menu Labeling Policy: Review of Evidence and Controversies,” *Current Obesity Reports*, 5 (1), 72–80.
- VanEpps, Eric M., Julie S. Downs, and George Loewenstein (2016a), “Advance Ordering for Healthier Eating? Field Experiments on the Relationship Between the Meal Order-Consumption Time Delay and Meal Content,” *Journal of Marketing Research*, 53 (3), 369–380.

VanEpps, Eric M., Julie S. Downs, and George Loewenstein (2016b), “Calorie Label Formats: Using Numeric and Traffic Light Calorie Labels to Reduce Lunch Calories,” *Journal of Public Policy & Marketing*, 35 (1), 26–36.

Variyam, Jayachandran (2005), “Nutrition Labeling in the Food-Away-From-Home Sector: An Economic Assessment,” *Economic Research Report* (Number 9), (accessed February 6, 2017), [available at https://www.ers.usda.gov/webdocs/publications/err4/29781_err4_002.pdf?v=41414].

Wansink, Brian (2003), “Overcoming the Taste Stigma of Soy,” *Journal of Food Science*, 68 (8), 2604–2606.

Wansink, Brian and Pierre Chandon (2006), “Meal Size, Not Body Size, Explains Errors in Estimating the Calorie Content of Meals,” *Annals of Internal Medicine*, 145 (5), 326–332.

Table 2.1**Study 2: Means (Standard Deviations) for Awareness and Manipulation Checks**

	No Menu Calorie Labeling (Control) 'a'	Menu Calorie Labeling (Voluntary) 'b'	Menu Calorie Labeling (Involuntary) 'c'
Calorie information awareness	1.73 (1.47) ^{b,c}	6.79 (0.86) ^a	6.95 (0.22) ^a
Voluntary calorie information	1.70 (1.20) ^{b,c}	6.26 (1.48) ^{a,c}	3.70 (2.33) ^{b,c}
Mandatory calorie information	3.19 (1.97) ^c	3.15 (2.02) ^c	6.53 (0.88) ^{a,b}

Notes: Superscripts adjacent to the means indicate significant differences ($p < .05$) between the focal condition and the conditions indicated by the superscript. Means are based on seven-point scales. Calorie information awareness was assessed with the following item: "Did the menu you viewed contain calorie information?" with endpoints of "definitely no/definitely yes." Voluntary calorie information was assessed with: "According to the menu, this restaurant voluntarily provides calorie information on their menu" with endpoints of "strongly disagree/strongly agree." Involuntary calorie information was assessed with: "According to the menu, the Food and Drug Administration mandates that this restaurant provide calorie information on their menu" with endpoints of "strongly disagree/strongly agree."

Table 2.2

Study 2: Indirect Effects of Voluntary and Mandatory Menu Calorie Labeling on Attitude Toward the Restaurant and Patronage Intention

Mediation Paths	Indirect Effect	95% CI
Indirect Effects on Attitude Toward the Restaurant (ATR)		
Calorie labeling (voluntary) → Concern → ATR	.40	[.09, .76]
Calorie labeling (mandatory) → Concern → ATR	.06	[-.28, .43]
Indirect Effects on Patronage Intention		
Calorie labeling (voluntary) → Concern → Patronage intention	.46	[.12, .92]
Calorie labeling (mandatory) → Concern → Patronage intention	.07	[-.31, .50]

Notes: This table shows the indirect effects through perceptions of restaurant concern for the (1) voluntary menu calorie labeling and (2) mandatory menu calorie labeling conditions, relative to the *no* menu calorie labeling control (Hayes and Preacher 2014). The CIs are bias-corrected bootstrap 95% confidence intervals.

Table 2.3**Study 5: The Conditional Indirect Effects (IEs) of Menu Calorie Labeling on Consumers' Attribute Expectations**

Mediation Paths	Perceived as Unhealthy		Perceived as Healthy	
	IE	95% CI	IE	95% CI
Calorie info. → Concern → Quality of food	.34	[.10, .72]	.12	[-.05, .34]
Calorie info. → Concern → Atmosphere	.42	[.12, .91]	.15	[-.05, .41]
Calorie info. → Concern → Trustworthiness	.38	[.11, .84]	.13	[-.05, .39]
Calorie info. → Concern → Service	.32	[.06, .77]	.11	[-.03, .36]
Calorie info. → Concern → Food safety concern	.34	[.09, .73]	.12	[-.04, .35]
Calorie info. → Concern → Friendliness of staff	.23	[.01, .62]	.08	[-.03, .31]
Calorie info. → Concern → Cleanliness	.29	[.05, .70]	.10	[-.03, .31]

Notes: Calorie info. indicates whether the calorie information was provided ('1' if provided; '0' if not provided), and concern is consumers' perception that the restaurant is concerned about the well-being of its customers. The CIs are bias-corrected bootstrap 95% confidence intervals.

Figure 2.1
Conceptual Model

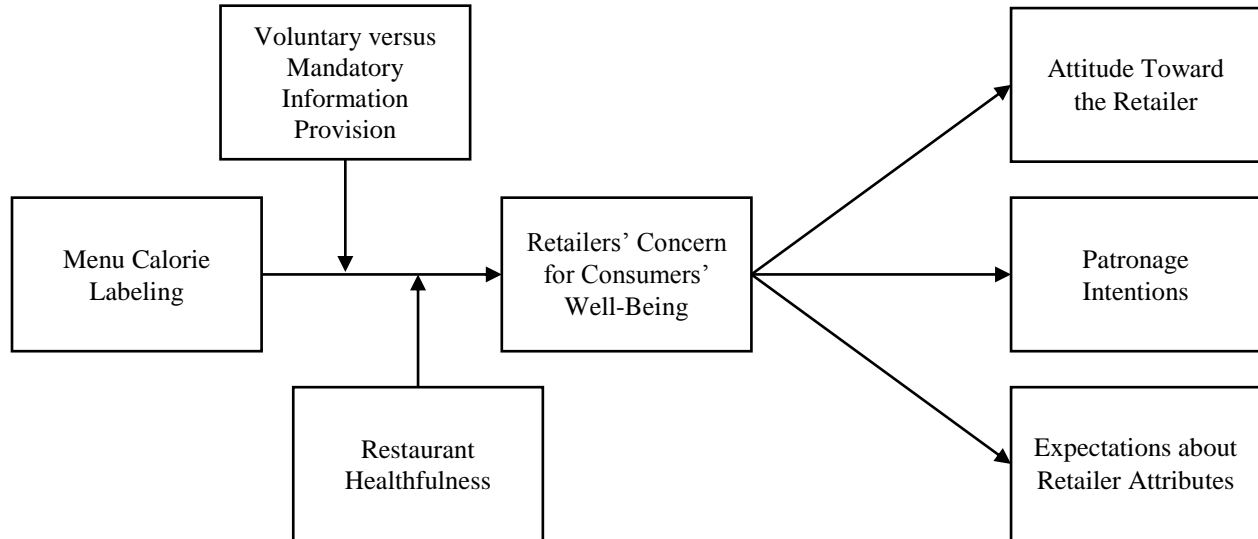


Figure 2.2

Study 1: Effect of Menu Calorie Labeling on Perceived Restaurant Concern for Customers' Well-Being

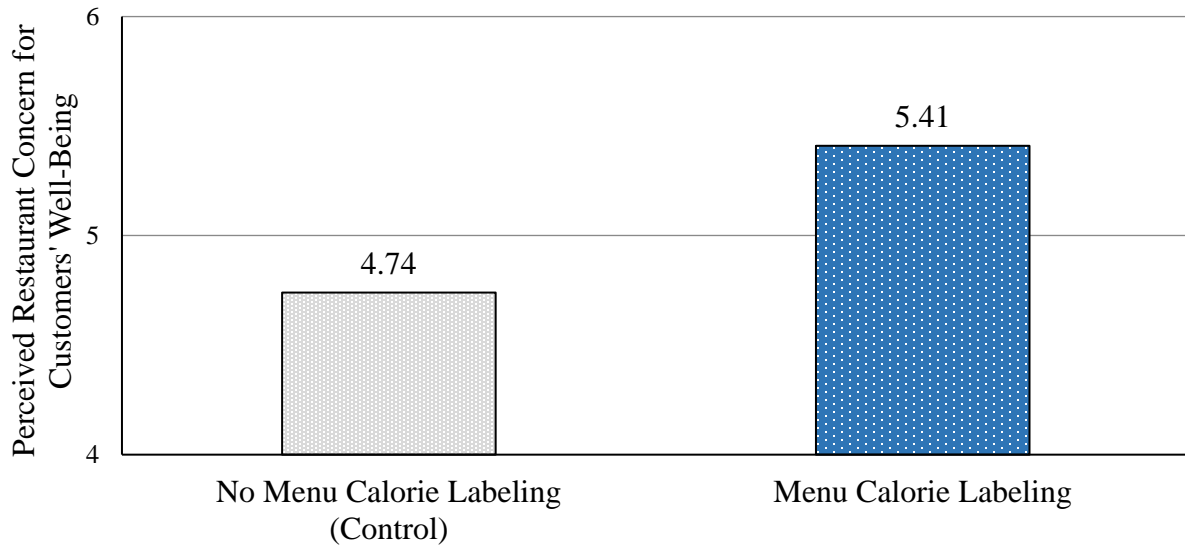
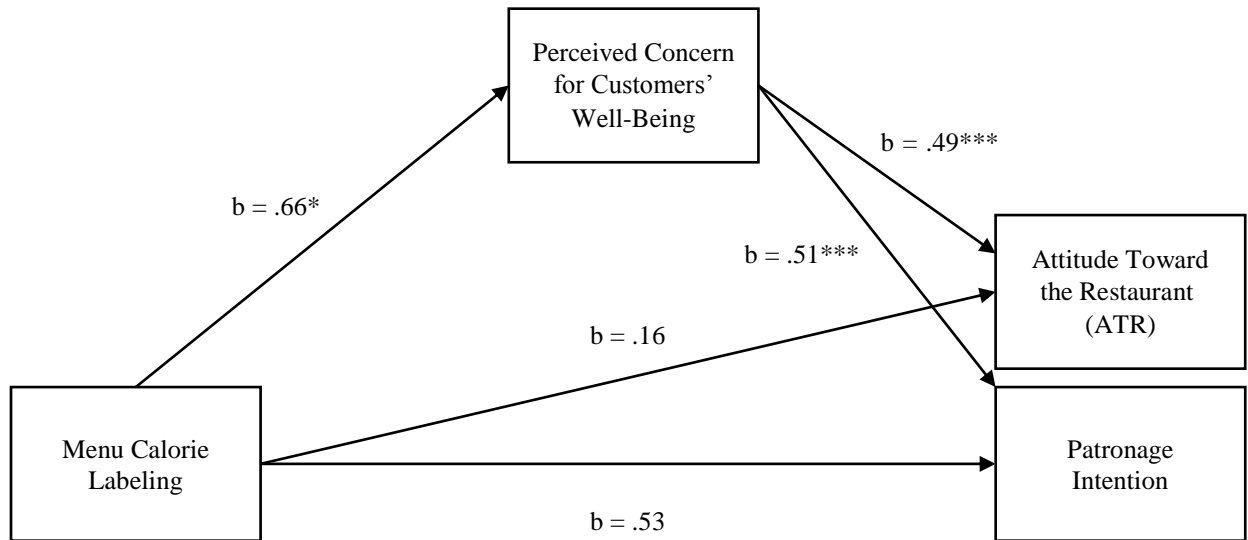


Figure 2.3

Study 1: Indirect Effects (IEs) of Menu Calorie Labeling on Attitude Toward the Restaurant and Patronage Intention



IE: Calorie Labeling → Concern → ATR = .32; Bias-corrected 95% bootstrap CI [.11, .67]

IE: Calorie Labeling → Concern → Patronage = .34; Bias-corrected 95% bootstrap CI [.10, .72]

$p < .05^*$; $p < .01^{**}$; $p < .001^{***}$

Figure 2.4

Study 2: Effects of Voluntary Versus Mandatory Menu Calorie Labeling on Perceived Restaurant Concern for Customers' Well-Being

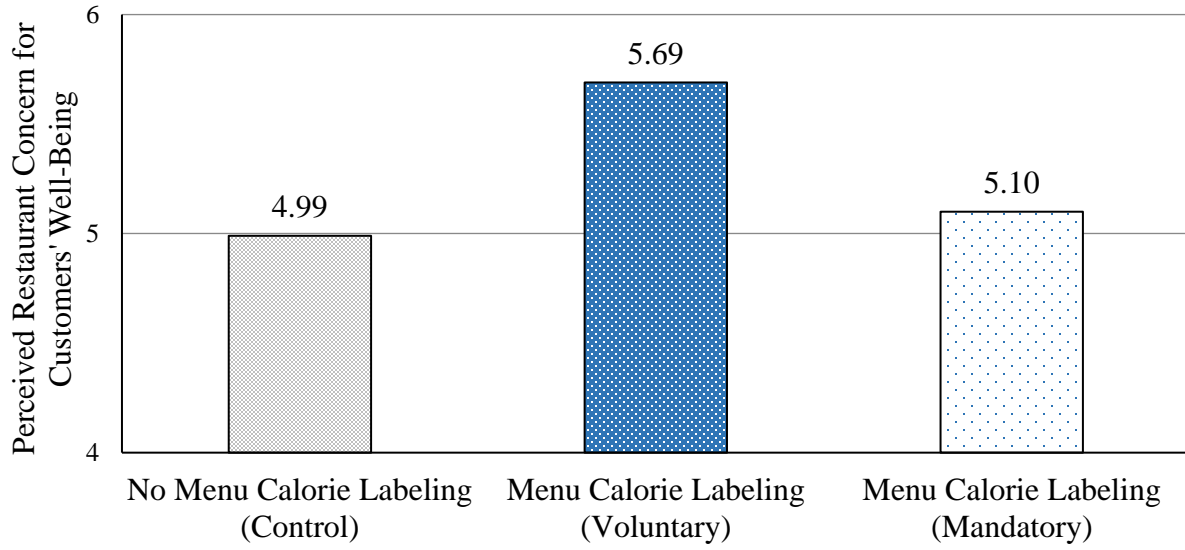
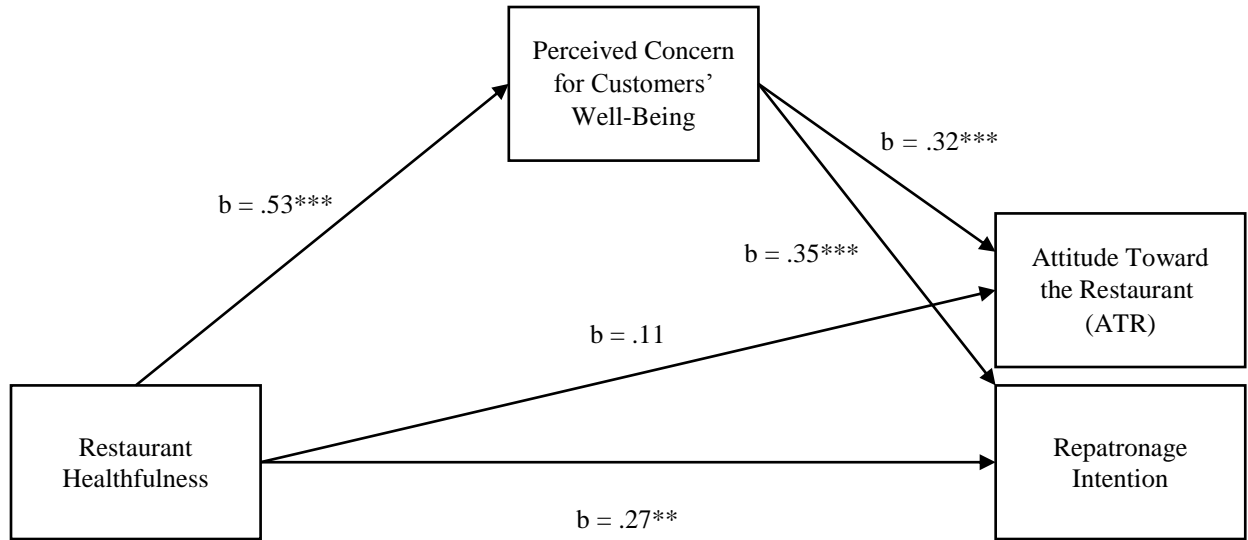


Figure 2.5

Study 3: The Relationship between Restaurant Healthfulness, Perceived Concern for Customers' Well-Being, Attitude Toward the Restaurant, and Repatronage Intention



IE: Healthfulness \rightarrow Concern \rightarrow ATR = .17; Bias-corrected 95% bootstrap CI [.08, .30]

IE: Healthfulness \rightarrow Concern \rightarrow Repatronage = .18; Bias-corrected 95% bootstrap CI [.08, .34]

$p < .05^*$; $p < .01^{**}$; $p < .001^{***}$

Figure 2.6

Study 4: Interactive Effect of Menu Calorie Labeling and Restaurant Healthfulness on Perceived Restaurant Concern in a Restaurant Field Experiment

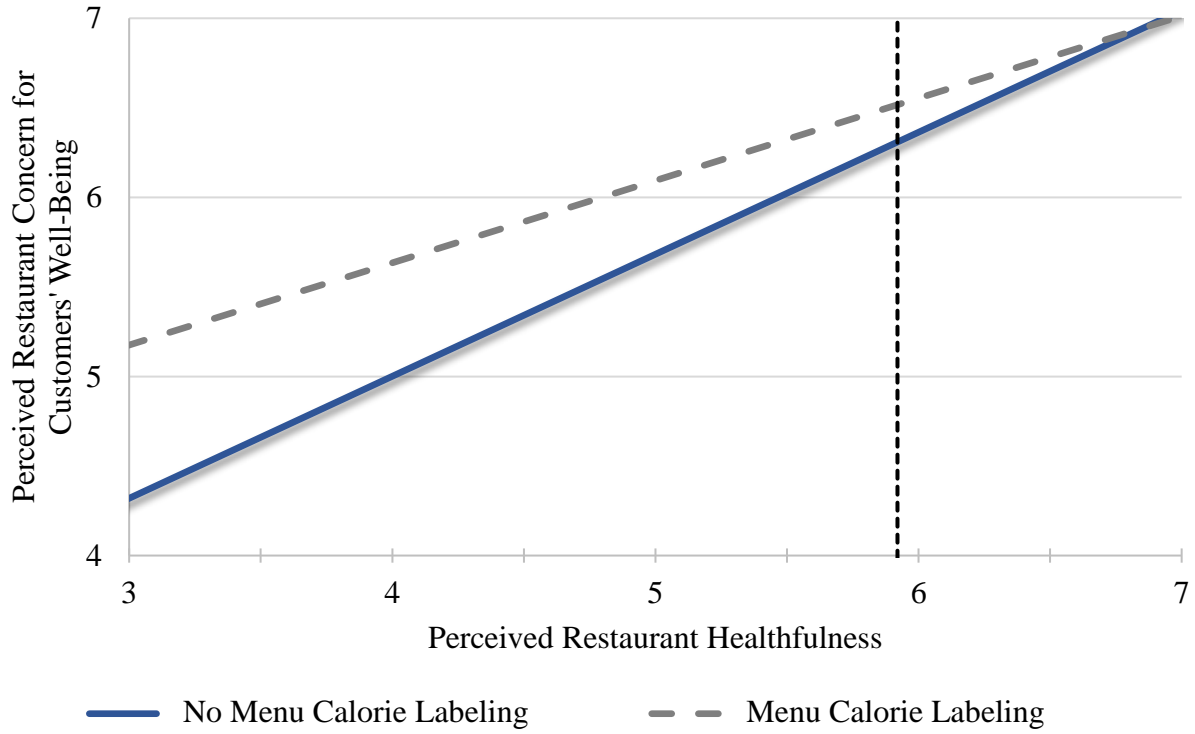
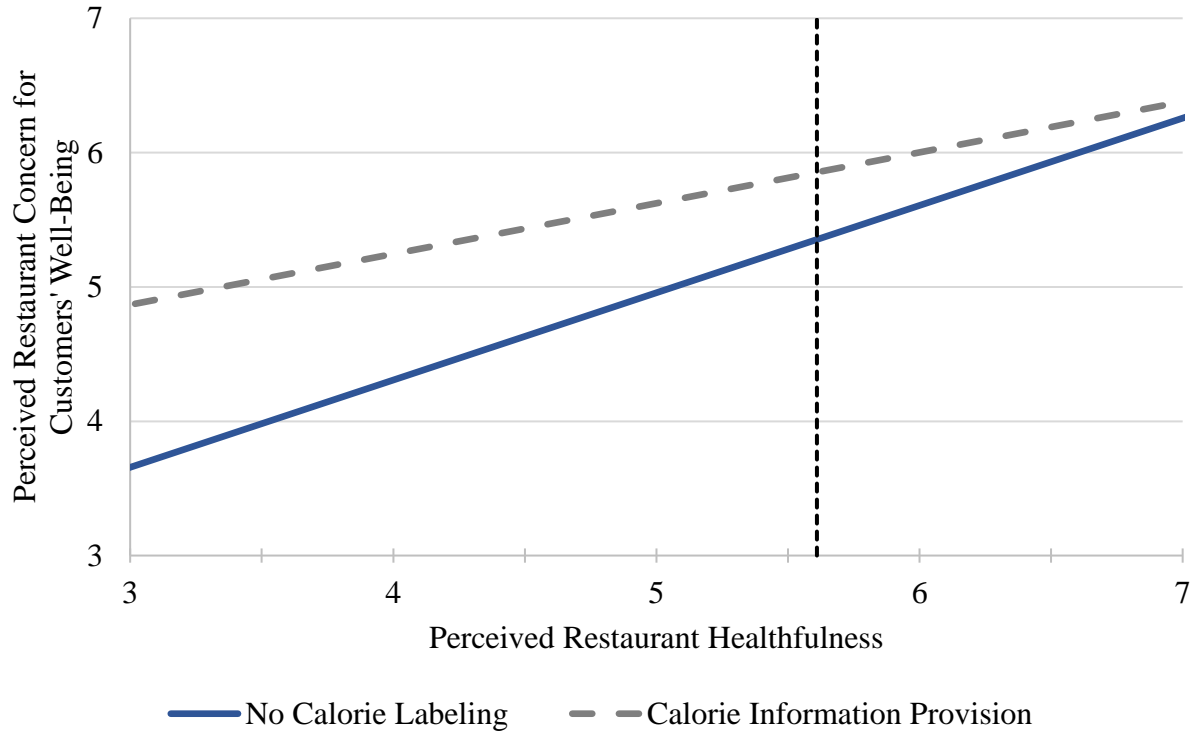


Figure 2.7

Study 5: Interactive Effect of Calorie Labeling in Restaurant Promotion and Restaurant Healthfulness on Perceived Restaurant Concern



Appendix 2.1

Studies 1 and 2: Experimental Stimuli

No Menu Calorie Labeling

**Broiled Chicken Platter**

Broiled chicken breast coated in our signature 7 herbs and spices mix, fresh grilled veggies and a whole wheat roll.

Grilled Chicken Sandwich

Grilled chicken breast topped with fried onion strings, Swiss cheese, honey mustard, lettuce, tomato, on a sesame seed bun, served with French fries.

Sirloin Steak with Rice and Grilled Veggies

100% USDA Choice 8 oz. sirloin with a carne asada rub, grilled veggies and Spanish rice.

Pasta Primavera

Our homemade rigatoni pasta, tossed in a light pesto sauce with fresh veggies and a touch of parmesan.

Cajun Pasta with Grilled Chicken

Penne Pasta with creamy garlic Alfredo sauce with Cajun spices.

New York Strip Steak

12 oz. cut topped with a garlic herb melted butter sauce, served with a loaded baked potato and green beans.

Turkey Club Sandwich

Triple-stacked sandwich with layers of fat-free turkey, fat-free ham, and turkey bacon, lettuce, tomato, and low-fat chipotle mayo, served with fresh veggies.

Crispy Chicken Wrap with French Fries

With fire-roasted corn, tortilla strips, cheddar, avocado and tomatoes. Served with ancho-chile ranch.

Blackened Baked Salmon

Fresh Atlantic salmon, blackened with Cajun spices, served with New Orleans dirty rice and fresh grilled veggies.

Parmesan Crusted Halibut

Alaskan Halibut crusted in a garlic herb parmesan mixture and baked, served with classic Italian risotto.

Beverages include soft drinks, iced tea, still and sparkling water.

Menu Calorie Labeling

**Broiled Chicken Platter****475 calories**

Broiled chicken breast coated in our signature 7 herbs and spices mix, fresh grilled veggies and a whole wheat roll.

Grilled Chicken Sandwich**1045 calories**

Grilled chicken breast topped with fried onion strings, Swiss cheese, honey mustard, lettuce, tomato, on a sesame seed bun, served with French fries.

Sirloin Steak with Rice and Grilled Veggies**490 calories**

100% USDA Choice 8 oz. sirloin with a carne asada rub, grilled veggies and Spanish rice.

Pasta Primavera**390 calories**

Our homemade rigatoni pasta, tossed in a light pesto sauce with fresh veggies and a touch of parmesan.

Cajun Pasta with Grilled Chicken**1350 calories**

Penne Pasta with creamy garlic Alfredo sauce with Cajun spices.

New York Strip Steak**1175 calories**

12 oz. cut topped with a garlic herb melted butter sauce, served with a loaded baked potato and green beans.

Turkey Club Sandwich**450 calories**

Triple-stacked sandwich with layers of fat-free turkey, fat-free ham, and turkey bacon, lettuce, tomato, and low-fat chipotle mayo, served with fresh veggies.

Crispy Chicken Wrap with French Fries**1610 calories**

With fire-roasted corn, tortilla strips, cheddar, avocado and tomatoes. Served with ancho-chile ranch.

Blackened Baked Salmon**410 calories**

Fresh Atlantic salmon, blackened with Cajun spices, served with New Orleans dirty rice and fresh grilled veggies.

Parmesan Crusted Halibut**1650 calories**

Alaskan Halibut crusted in a garlic herb parmesan mixture and baked, served with classic Italian risotto.

Beverages include soft drinks, iced tea, still and sparkling water.

Notes: The menus presented to participants were larger in size. These menus were reduced in size to fit in the appendix.

Appendix 2.2

Study 2: Experimental Stimuli

No Menu Calorie Labeling and Voluntary Menu Calorie Labeling

Times Free Press

February 2017 | by Staff Report | in Regional News | Read time: 1 min.

The importance of protecting personal information from identity thieves

Identity theft occurs when someone uses your personal information, such as your name, Social Security number, or credit or debit card number without your permission, to commit fraud or other crimes. The Federal Trade Commission estimates that as many as 9 million Americans have their identities stolen each year. In fact, you or someone you know may have experienced some form of identity theft.

While some identity theft victims can resolve their problems quickly, others spend hundreds of dollars and many days repairing damage to their good name and credit record. The crime takes many forms and you may not find out about the theft until you review your credit report or a credit card statement and notice charges you did not make – or until you are contacted by a debt collector. The best way to find out is to monitor your accounts and bank statements each month, and check your credit report on a regular basis. By checking your credit report regularly, you may be able to limit the damage caused by identity theft.

Mandatory Menu Calorie Labeling

Times Free Press

February 2017 | by Staff Report | in Regional News | Read time: 1 min.

The River Café now provides calorie information on menus, as required by the Food and Drug Administration

Calorie labeling is now required for restaurants and similar retail food establishments that are part of a chain of 20 or more locations. For standard menu items, calories will be listed clearly and prominently on menus and menu boards, next to the name or price of the food or beverage. Restaurants and similar retail food establishments that are not otherwise covered by the law may elect to become subject to these Federal requirements by registering every other year with the Food and Drug Administration (FDA). That is, although calorie labeling is not required for restaurants with fewer than 20 locations, it is an option for restaurant chains that voluntarily choose to offer the information to their consumers. “Making calorie information available on chain restaurant menus and vending machines is an important step for public health that will help consumers make informed choices for themselves and their families,” said FDA Commissioner Margaret A. Hamburg, M.D.

These new regulations impact many chain restaurants, including those who are now required to provide calorie information and those who voluntarily elect to do so. For example, The River Café, a regional restaurant chain with 50 locations, now lists calorie information on their menus for all menu items. “We are happy to provide calorie information, as required by the Food and Drug Administration, to help consumers make more informed choices while dining at The River Café,” the owner of this regional chain told the *Times Free Press* in an interview.

Appendix 2.3

Study 5: Experimental Stimuli



 BISTRO ON NORTH 

Popular menu items

Blackened Baked Salmon

Fresh Atlantic salmon, blackened with Cajun spices, served with New Orleans dirtyrice and grilled veggies

New York Strip Steak

12 oz. cut topped with a garlic herb melted butter sauce, served with a loaded baked potato and green beans

Classic Pork Chop

Grilled pork chops served over jasmine rice with a side of grilled veggies.

bistro.north.com | (958) 555-1234
322 North Street, Springfield



 BISTRO ON NORTH 

Popular menu items

Blackened Baked Salmon - 410 calories

Fresh Atlantic salmon, blackened with Cajun spices, served with New Orleans dirtyrice and grilled veggies

New York Strip Steak - 1290 calories

12 oz. cut topped with a garlic herb melted butter sauce, served with a loaded baked potato and green beans

Classic Pork Chop - 850 calories

Grilled pork chops served over jasmine rice with a side of grilled veggies.

bistro.north.com | (958) 555-1234
322 North Street, Springfield

CONCLUSION

Recapitulation of Findings and Contributions

Academic marketing research can play a critical role in addressing major societal and public policy issues and understanding the consequences of public policy decisions for both firms and consumers is an important area of this research (Bloom and Gundlach 2001; Wilkie 2005; Wilkie and Moore 2006; 2012). The obesity epidemic in the United States certainly constitutes a major societal issue (Bublitz, Peracchio, and Block 2010; CDC 2017; ERS 2017; Seiders and Petty 2004). Public policy makers have made critical policy decisions to address the prevalence of obesity, and a couple of these key decisions focus on the provision of nutrition information to consumers. For example, the Nutrition Labeling and Education Act (NLEA) of 1990 (Public Law 101-535) is a Federal law which requires the Nutrition Facts panels (NFP) on packaged food products (FDA 1993). More recently, the Affordable Care Act (ACA) of 2010 mandated the provision of calorie information on the menus and menu boards of restaurant chains and other large retail food establishments. The compliance date for this mandate has been extended multiple times, and now the FDA will begin enforcing this mandate on May 7, 2018 (FDA 2014; 2016; 2017). The goal of these policy decisions is to help consumers make more informed, healthful food choices (FDA 2010; 2014; 2016; Kozup, Creyer, and Burton 2003; Moorman 1996). While a large body of consumer research has evaluated the effectiveness of the NFP, very little consumer research has been conducted to understand the impacts of menu calorie labeling. Therefore, the purpose of this research is to develop conceptual frameworks and provide empirical evidence to better understand the impact of menu calorie labeling on consumers' choice behavior and responses to food retailers.

Essay 1 offers a conceptual framework focusing on consumers' food-value orientations and evaluates the impact of this major policy change (i.e., provision of calorie information on menus and menu boards) on consumer choice behavior. Using a series of several studies, multi-item measures of these food-value orientations are developed and tested to ensure that the measures are reliable and valid. Further, these newly developed and psychometrically sound measures are used to examine consumers' food choices and demonstrate how these food-value orientations moderate the effects of objective calorie information provision on the number of calories ordered by consumers. The empirical support for the moderating roles of consumers' food-value orientations on the effects of calorie information provision on calories ordered is buttressed by the findings of a restaurant field experiment. Specifically, findings from three experiments, including the field experiment, show that food-value orientations are associated with asymmetric responses to calorie labeling on restaurant menus and menu boards. Thus, policy makers could benefit from considering these asymmetric effects when evaluating the success (or failure) of information disclosures, and consumer researchers may benefit from assessing food-value orientations when considering consumers' food choices or responses to other types of communication (e.g., food promotion).

Essay 2 empirically examines the impacts of this major policy change on outcomes of interest to restaurants and food retailers. Findings across five studies, including two restaurant field studies, demonstrate that menu calorie labeling has a positive direct effect on consumers' perceptions of restaurant concern for customer well-being and positive indirect effects on attitudes toward the retailer, intentions to visit the retailer, and overall retailer-related attribute expectations. However, the positive effects of menu calorie labeling on these focal outcomes are qualified by the attribution of the behavior (voluntary provision of information versus mandatory

provision of information) and the perceived health positioning of the restaurant (more versus less healthful) (Chandon and Wansink 2007; Folkes 1988; Kelley 1967; 1973). Therefore, in aggregate, the findings from these five studies support a conceptual framework that is developed to better understand the consequences of the provision of objective nutrition information and perceived restaurant healthfulness on consumers' responses to food retailers.

Directions for Future Research

Essay 1 developed psychometrically sound measures of consumers' enduring food-value orientations that may be used to better understand consumers' food choices and responses to objective information provision. However, the application experiments presented in this essay focused primarily on the role consumers' food-value orientations have on a single form of information provision—calorie information on restaurant menus and menu boards. There are numerous potential avenues of future research that can employ this conceptual framework to continue to expand our understanding of the consequences of menu calorie labeling on consumer choice or extend this framework to other contexts to examine consumers' responses to other food-related communications.

When considering consumers' food choices, beyond calorie information provision and consumers' food-value orientations, there are many environmental and contextual factors that may directly influence consumers' food choices, as well as the overall healthfulness of those choices (Wansink and Chandon 2014). Consumers' food-value orientations may interact with those factors in ways that increase or decrease the objective healthfulness of consumers' choices. The potential for these complex interactions warrants additional consideration. Furthermore, this

conceptual framework could be used to examine how consumers may respond to various forms of restaurant or brand positioning, promotional efforts, value appeals and pricing, and other forms of nutrition information. Extending these research directions, appeals aligning with either taste-value or quantity-value orientation could be used at the point-of-purchase as “nudges” to improve the objective healthfulness of the food consumption decisions made by consumers with these orientations. In addition, given the value component of this conceptual framework, these orientation measures could be used to understand how price changes and value pricing across various types of restaurant meals (e.g., tasty meals, healthful meals, very large meals) have asymmetric effects on consumer demand based on consumers’ enduring orientations (Haws and Liu 2016; Haws and Winterich 2013).

Furthermore, additional research can be conducted to further our understanding of the consequences of menu calorie labeling as a strategy by public health advocates to improve the healthfulness of consumers’ food choices. For example, the effects of menu calorie labeling should be examined across restaurant settings (e.g., more versus less healthful restaurants, fast-food versus table-service restaurants) and other retail food establishments (e.g., grocery store delicatessens). Extant research has also found that calorie labeling is most effective when objective calorie levels differ substantially from consumers’ calorie expectations (e.g., Burton and Kees 2012; Burton et al. 2006; Burton, Howlett, and Tangari 2009). Therefore, consumers’ expectations could be considered alongside food-value orientations in future research. Calorie labeling could be more effective in reducing calories ordered at restaurants with many “surprise items” on the menu that differ from consumers’ expectations. In these cases, the direct effect of health-value orientation may not be as strong because health-value oriented consumers need the additional information provided by menu calorie labeling to make a healthful, low calorie menu

selection; however, the moderating role of health-value orientation may be accentuated. This also highlights the need for future research examining calorie labeling effects at the item level and longitudinally as consumers become more accustomed to seeing calorie information on menus and menu boards. That is, items may differ in how much they deviate from expectations, and the distance between objective calorie levels and consumers' calorie expectations may decrease over time.

Future research should also continue to consider the effects of menu calorie labeling on retailer-related outcomes. This research drew from attribution theory to demonstrate the benefit to restaurants of voluntary provision of calorie information on menus. However, the reverse could also be considered. That is, when menu calorie labeling becomes mandatory at major restaurant chains, what does this do to consumers' expectations for calorie information at smaller restaurant chains? For example, do health-oriented consumers patronize restaurant chains *not* subject to this mandate less frequently because they appreciate having calorie information available at larger chains? In contrast, do some consumers choose restaurants without calorie labeling because they want to avoid exposure to calorie information when making food choices? Further, to bolster external validity and provide additional managerial insights, the conceptual framework supported in Essay 2 could be extended to other retail food establishments, such as grocery store delicatessens. Finally, beyond consumers' retailer perceptions, attitudes, and patronage intentions, menu calorie labeling may affect other outcomes of critical interest to management of restaurants and other retail establishments, including item sales, dining frequency, traffic share, etc., that could be considered in future research. When considering these effects, especially on item sales, the mediating roles of consumers' processing fluency—both conceptual and perceptual—of the information at the point-of-purchase should be considered in

future research (e.g., Lee and Labroo 2004; Schwarz 2004); processing fluency has been shown to play a mediating role in the effects of various forms of nutrition information on evaluations of both products and retailers (e.g., Newman, Howlett, and Burton 2014; 2016).

Conclusion

In conclusion, this dissertation provides conceptual frameworks and empirical evidence to evaluate the potential impacts of a major policy change on both consumer-related and retailer-related outcomes. The conceptualizations and empirical findings communicated in this dissertation have clear implications for consumer researchers interested in consumers' food consumption decisions, consumer health and well-being, public policy makers, and management of restaurants and food retailers and provides a foundation for many avenues of future research. However, beyond these specific findings, this dissertation demonstrates the importance of using a marketing lens to provide a more comprehensive understanding of the potential consequences of policy changes for consumers and marketing practice.

References

- Bloom, Paul N. and Gregory Thomas Gundlach (2001), "Introduction" in *Handbook of Marketing and Society*, Paul N. Bloom and Gregory Thomas Gundlach, eds. Thousand Oaks, CA: Sage Publications, Inc.
- Burton, Scot and Jeremy Kees (2012), "Flies in the Ointment? Addressing Potential Impediments to Population-Based Health Benefits of Restaurant Menu Labeling Initiatives," *Journal of Public Policy & Marketing*, 31 (2), 232–239.
- Burton, Scot, Elizabeth H. Creyer, Jeremy Kees, and Kyle Huggins (2006), "Attacking the Obesity Epidemic: The Potential Health Benefits of Providing Nutrition Information in Restaurants," *American Journal of Public Health*, 96 (9), 1669–1675.
- Burton, Scot, Elizabeth Howlett, and Andrea Heintz Tangari (2009), "Food for Thought: How Will the Nutrition Labeling of Quick Service Restaurant Menu Items Influence Consumers' Product Evaluations, Purchase Intentions, and Choices?," *Journal of Retailing*, 85 (3), 258–273.
- Bublitz, Melissa G., Laura A. Peracchio and Lauren G. Block (2010), "Why Did I Eat That? Perspectives on Food Decision Making and Dietary Restraint," *Journal of Consumer Psychology*, 20, 239–258.
- Chandon, Pierre and Brian Wansink (2007), "The Biasing Health Halos of Fast-Food Restaurant Health Claims: Lower Calorie Estimates and Higher Side Dish Consumption Intentions," *Journal of Consumer Research*, 34 (3), 301–314.
- Folkes, Valerie S. (1988), "Recent Attribution Research in Consumer Behavior: A Review and New Directions," *Journal of Consumer Research*, 14 (4), 548–565.
- Food and Drug Administration (FDA) (2016), "A Labeling Guide for Restaurants and Retail Establishments Selling Away-From-Home Foods-Part II (Menu Labeling Requirements in Accordance with the Patient Protection Affordable Care Act of 2010); Guidance for Industry; Availability," *Federal Register*, 81 (87), 27067–27068.
- Food and Drug Administration (FDA) (2014), "Food Labeling; Nutrition Labeling of Standard Menu Items in Restaurants and Similar Retail Food Establishments," *Federal Register*, 79 (230), 71155–71259.
- Food and Drug Administration (FDA) (2017), "Food Labeling; Nutrition Labeling of Standard Menu Items in Restaurants and Similar Retail Food Establishments; Extension of Compliance Date; Request for Comments," *Federal Register*, 82 (85), 20825–20829..
- Food and Drug Administration (FDA) (2010), "Front-of-Pack and Shelf Tag Nutrition Symbols; Establishment of Docket: Request for Comments and Information," *Federal Register*, 75 (82), 22602–22606.

- Haws, Kelly L. and Karen Page Winterich (2013), "When Value Trumps Health in a Supersized World," *Journal of Marketing*, 77 (3), 48–64.
- Haws, Kelly L. and Peggy J. Liu (2016), "Half-Size Me? How Calorie and Price Information Influence Ordering on Restaurant Menus with Both Half and Full Entrée Portion Sizes," *Appetite*, 97 (1), 127–137.
- Kelley, Harold H. (1973), "The Processes of Causal Attribution," *American Psychologist*, 28 (2), 107–128.
- Kelley, Harold H. (1967), "Attribution Theory in Social Psychology," *Nebraska Symposium on Motivation*, 15, 192–238.
- Kozup, John C., Elizabeth H. Creyer, and Scot Burton (2003), "Making Healthful Food Choices: The Influence of Health Claims and Nutrition Information on Consumers' Evaluations of Packaged Food Products and Restaurant Menu Items," *Journal of Marketing*, 67 (2), 19–34.
- Lee, Angela Y. and Aparna A. Labroo (2004), "The Effect of Conceptual and Perceptual Fluency on Brand Evaluation," *Journal of Marketing Research*, 41 (2), 151–165.
- Moorman, Christine (1996), "A Quasi Experiment to Assess the Consumer and Informational Determinants of Nutrition Information," *Journal of Public Policy and Marketing*, 15 (1), 28–44.
- Newman, Christopher L., Elizabeth Howlett, and Scot Burton (2016), "Effects of Objective and Evaluative Front-of-Package Cues on Food Evaluation and Choice: The Moderating Influence of Comparative and Noncomparative Processing Contexts," *Journal of Consumer Research*, 42 (5), 749–766.
- Newman, Christopher L., Elizabeth Howlett, and Scot Burton (2014), "Shopper Response to Front-of-Package Nutrition Labeling Programs: Potential Consumer and Retail Store Benefits," *Journal of Retailing*, 90 (1), 13–26.
- Schwarz, Norbert (2004), "Metacognitive Experiences in Consumer Judgement and Decision Making," *Journal of Consumer Psychology*, 14 (4), 332–348.
- Seiders, Kathleen and Ross D. Petty (2004), "Obesity and the Role of Food Marketing: A Policy Analysis of Issues and Remedies," *Journal of Public Policy & Marketing*, 23 (2), 153–169.
- Wansink, Brian, and Pierre Chandon (2014), "Slim by Design: Redirecting the Accidental Drivers of Mindless Overeating," *Journal of Consumer Psychology*, 24 (3), 413–431.
- Wilkie, William L. (2005) "Needed: A Larger Sense of Marketing and Scholarship," *Journal of Marketing*, 69 (4), 8–10.

Wilkie, William L. and Elizabeth S. Moore (2012), "Expanding Our Understanding of Marketing in Society," *Journal of the Academy of Marketing Science*, 40 (1), 53–73.

Wilkie, William L. and Elizabeth S. Moore (2006), "Macromarketing as a Pillar of Marketing Thought," *Journal of Macromarketing*, 26 (2), 224–232.

GENERAL APPENDIX

IRB Approval Letters



UNIVERSITY OF
ARKANSAS

Office of Research Compliance
Institutional Review Board

June 8, 2015

MEMORANDUM

TO: Scot Burton
Betsy Howlett
Chris Berry

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 15-05-747

Protocol Title: *Examining the Value of Food*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 06/08/2015 Expiration Date: 06/07/2016

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<https://vpred.uark.edu/units/rscp/index.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 2,000 participants. If you wish to make any modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior* to implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.



November 10, 2015

MEMORANDUM

TO: Scot Burton
Elizabeth Howlett
Christopher Berry

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 15-10-189

Protocol Title: *Restaurant Survey*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 11/06/2015 Expiration Date: 11/05/2016

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<https://vpred.uark.edu/units/rscp/index.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 1,500 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.



May 19, 2016

MEMORANDUM

TO: Scot Burton
Betsy Howlett
Chris Berry

FROM: Ro Windwalker
IRB Coordinator

RE: PROJECT CONTINUATION

IRB Protocol #: 15-05-747

Protocol Title: *Examining the Value of Food*

Review Type: EXEMPT EXPEDITED FULL IRB

Previous Approval Period: Start Date: 06/08/2015 Expiration Date: 06/07/2016

New Expiration Date: 06/07/2017

Your request to extend the referenced protocol has been approved by the IRB. If at the end of this period you wish to continue the project, you must submit a request using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. Failure to obtain approval for a continuation on or prior to this new expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

This protocol has been approved for 2,000 total participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior* to implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.



January 23, 2017

MEMORANDUM

TO: Scot Burton
Elizabeth Howlett
Chris Berry

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 17-01-375

Protocol Title: *Restaurant Ratings*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 01/20/2017 Expiration Date: 01/19/2018

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<https://vpred.uark.edu/units/rscp/index.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 1,000 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.



March 16, 2017

MEMORANDUM

TO: Christopher Berry
Scot Burton
Elizabeth Howlett

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 17-02-492

Protocol Title: *Examining Menu Items*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 03/16/2017 Expiration Date: 03/15/2018

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<https://vpred.uark.edu/units/rscp/index.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 1,000 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.