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Eating Behavior and Obesity

Behavioral Economics Strategies for Health Professionals

Shahram Heshmat, PhD
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This book utilizes behavioral economics as the overarching conceptual framework to discuss the root causes of obesity. This relatively new field blends insights from psychology and economics. Behavioral economics is a generalization of rational choice theory, which incorporates concepts of rationality, willpower, and self-interest in a systemic way. Its basic premise is that humans are hardwired to make judgment errors and they need a “nudge” to make decisions that are in their own best interest. The field of behavioral economics is mostly unknown to practitioners in public health, yet it can offer a valuable framework for understanding health behavior for public health professionals. Principles of behavioral economics can capture the complexity of individual judgments and health behaviors; this makes it a useful foundation for improving health promotion policy.

Behavioral economics provides a framework to understand when and how people make errors. Basic tenets of behavioral economics demonstrate that the environment plays an important role in eating and body weight regulation. This introductory text integrates the basic concepts of behavioral economics and public health to increase our understanding of individual eating behaviors that can then be integrated into the formulation of preventive strategies.

The traditional economic perspective relies on a “market” approach, in which individuals are assumed to be making autonomous decisions based on their own preferences with a goal of maximizing individual satisfaction. However, many of these assumptions are inaccurate and simply do not fit what we know about individual behavior from public health. Human beings have limited cognitive abilities and limited willpower. Conscious and unconscious factors influence people’s decisions in ways that cause us to act against our own best interest. As will be discussed throughout this text, biases, gut feelings, and habits often compete with deliberate consideration of information. While individuals may be aware
of the factors that contribute to obesity, their everyday lifestyle choices do not reflect this knowledge. Rather, these choices are often made in an unconscious and more impulsive manner. Because of this, individuals frequently make decisions that depart systematically from the predictions of economists’ standard rational model. Behavioral economics attempts to understand these departures and, more generally, integrate psychologists’ understanding of human behavior into economic analysis. Identifying ways in which behavior systematically deviates from optimality can then generate new insights into the underlying choice mechanism. Understanding why, how, and when people choose certain foods and consume them in certain amounts is a useful approach to preventing or simply changing potentially unhealthy eating behavior that contributes to obesity. Based on the findings and methods of behavioral economics, the book presents intervention strategies to help individuals to improve their eating behavior and enhance their well-being. Armed with the information presented in this text, it is hoped that readers understand the psychology behind excessive eating and learn how to promote a long-term healthy lifestyle.

**OBJECTIVE**

The purpose of this book is to present a behavioral economics perspective on food choice. An understanding of the factors that influence food choice helps reveal some of the difficulties, as well as solutions, in directing individuals toward healthier eating behavior. From a behavioral economics perspective, public policy attempts to foster healthy eating behaviors that focus on understanding and changing the way individuals make food decisions.

Behavioral economics identifies a large number of circumstances in which people seem to behave inconsistently and in which their decisions deviate from what is predicted by the rational principles of the standard economic model. Identifying these conditions provides an understanding of, for example, what factors make it harder for dieters to resist attractive food, and will help dieters to resist temptation. Knowing why people fail to maintain a desired healthy behavior over time will go some ways toward avoiding relapse, and to move people in a direction that will make their lives better.

It is hoped that this book will enhance the understanding of decision-making processes that underlie maintaining a desired healthy behavior over the long term. This is accomplished by looking at conditions in which the decision making is impaired or even breaks down. The knowledge of these biases should help dieters to develop problem-solving skills in weight management. A recent review of studies on the effectiveness of
weight-maintenance strategies concludes that programs that incorporate continued skills in problem-solving and coping with challenges, and techniques for sustaining behavior change, lower the rate of relapse (Institute of Medicine [IOM], 2004). The increased knowledge of behavioral economics could promote effective weight-loss management and obesity prevention, and improve population-based health benefits (IOM, 2004).

HOW THIS BOOK IS ORGANIZED

The book is organized into 12 chapters. The chapters are structured around a series of basic concepts about individual eating behavior.

Chapter 1, “Behavioral Economics and Eating Decisions,” explains basic concepts in behavioral economics and how they might be applied to eating behaviors.

Chapter 2, “Explaining Eating Behavior,” briefly discusses trends in obesity and its consequences on population health. Overeating is one of the most pressing health issues affecting developed countries. The main goal in this chapter is to understand why we overeat. The chapter describes the biological and behavioral factors that influence eating behavior and the processes by which they influence body weight. Changes in these factors might be responsible for increased food intakes and obesity.

Chapter 3, “Some Basic Economic Concepts,” describes basic economic concepts and tools as they apply to resource allocation decisions. The main objective is to enhance readers’ understanding of economic behavior.

Chapter 4, “An Economic Perspective on Eating Behavior,” explains the link between the rising obesity rates and the economics of food choice. The chapter describes the relevance of fast food, food marketing, and social effects on how we make choices about what we eat. It also offers implications for interventions.

Chapter 5, “Socioeconomic Disparities in Health and Obesity,” focuses on the broader individual as well as social determinants of overweight and obesity. This perspective attempts to understand and explain obesity at the population level by going beyond the individual characteristics (e.g., diet and physical activity levels). In this chapter, socioeconomic status, disparities, poverty, social norms, and other factors are considered as they impact eating habits and obesity.

Chapter 6, “Decision Making Over Time,” uses economic principles to explain how delayed rewards are discounted by individuals, and the ways in which people undervalue the future consequences of their actions. The impact of these principles upon our eating decisions will be discussed.
Chapter 7, “How We Make Decisions: The Role of Emotion,” explains the importance of emotion in guiding individual behavior. These insights help to identify systematic decision-making errors that people make, and their consequences for health behavior. To understand how people make food choices and how we can improve that and promote health, we must pay attention to the thought patterns and feelings that determine appetitive behavior.

Chapter 8, “Food Addiction and Obesity,” describes the similarity between drug addiction and obesity. There is considerable overlap between brain systems and neurotransmitters that mediate drug addiction and obesity. It explains why some people have difficulty moderating their intake of palatable foods, such as sweet foods. It explains why we have food cravings and how cravings are elicited. It also examines the personality trait of impulsivity and its relationship to overeating.

Chapter 9, “Overeating and Decision-Making Deficits,” illustrates the role of brain reward system dysfunction in overeating and obesity. The chapter will demonstrate how dysfunction in decision-making contributes to overeating and obesity. The result of dysfunction in decision-making is an enhanced value of one type of reward (food for the obese individuals) at the expense of other rewards.

Chapter 10, “Why Dieters Relapse,” enumerates a number of factors that tend to interfere with dieters’ resolve to diet, and induce them to become impulsive. This chapter integrates the insights of behavioral economics concepts to explain why people fail to stick to their goal of eating a healthy diet.

Chapter 11, “Self-Control Strategies,” illustrates self-control strategies people can use to protect themselves against irrational tendencies, such as unhealthy eating. Behavioral economics provides a series of strategies and tools to counter the powerful forces that encourage people to eat fatty and high-calorie foods.

Chapter 12, “Policy Implications and Conclusion,” concludes with programmatic and policy suggestions that may help change eating behaviors, based on the information presented in the rest of the volume.

AUDIENCE

This book is based on the conviction that a knowledge of behavioral economics has great potential value to public health professionals and that it can be delivered in a language and framework that are understandable and relevant to their experience and needs. The text is primarily targeted for professors and students in public health and related programs concerned about trends in food, nutrition, obesity, and dieting behavior. The secondary audiences are policymakers, who can use behavioral
economics concepts to better understand the barriers to making healthy choices by individuals. This book would be useful as a stand-alone or as a supplementary book in courses such as health economics, health behavior, and public health policy. The book does not assume advanced knowledge of economics or decision analysis.

Preparing this book has been a quite challenging and enriching experience for me. I have learned a great deal. Moreover, the experience has changed the way I think and behave with regard to food. I hope that similar benefits will be passed to you, the reader, as well.
Acknowledgments

The study of behavioral economics of food choice has been at the center of my research and teaching over the past 5 years. The work presented here is a reflection of countless influences. Several authors have shaped my views on this topic: Ainslie, Damasio, Elster, Kahneman, Loewenstein, Wansink, and many others. I am deeply grateful to all those who have contributed to the development of my perspective.

The initial preparation of this book took place while I taught a course in the Department of Public Health at the University of Illinois at Springfield. I have gained a great deal of insights and feedback from students as I struggled to explain my understanding of the relevance of behavioral economics to eating behavior.

I am also grateful to those who have supported my effort in completing this project. These include my beloved wife, Monica, whose patience and sensitivity have been a great support, as well as my two children, Colin and Claire. I am very grateful to my family for tolerating me while I struggled to prepare this book. Finally, I owe special thanks to my editor, Jennifer Perillo, for her support and encouragement in developing this book. Her refusal to tolerate my inclination to procrastinate gave me a powerful incentive to complete it on time. I regret any errors that may appear in this book and take full responsibility for them.
Behavioral Economics and Eating Decisions

INTRODUCTION

Individual lifestyle choices are fundamental to improvements in health status. About half of all deaths in the United States are attributable to a small number of preventable behaviors and exposures, such as smoking, poor diet, and lack of exercise.\(^1\) Next to smoking, obesity is the leading behavioral cause of death. With the decline in the prevalence of smoking, obesity may have become the most important determinants of health. People who maintain nutritious diets lower their risk of certain diseases. There is an increasing awareness that dietary intervention can prevent, delay, and treat many common diseases and enhance the quality and length of life. As a consequence of the rising cost of conventional medical treatment and drugs, health-care providers and public health policy makers are increasingly looking to diet as a means to decrease the incidence of many chronic and age-related diseases.

Dieting, a conscious restriction of food intake to prevent weight gain or promote weight loss, is a popular means of weight control. Americans spend many billions of dollars each year trying to lose weight through dieting and/or exercise. Estimates are that about half of men and two-thirds of women are trying to lose weight at any given time (Sreeoebe, 2008). Despite documented short-term success, most diet plans have very low success rates, and most dieters regain their weight back within 3–5 years\(^2\) (Hill, 1999; IOM, 2003). About half the people on weight loss programs are likely to weigh more 4 years after their diet than they did before (Mann et al., 2007). This indicates that dieters are eating more than their bodies need to maintain energy balance.\(^3\) Dieters tend to display disinhibited

\(^{1}\)According to the American Cancer Society, about a third of the 550,000 American cancer deaths each year are linked to obesity, poor diet, and inactivity. Another third are due to smoking.

\(^{2}\)People facing serious illness such as heart attack or stroke are three times more likely to quit smoking than lose weight. One reason for the disparity is the lack of insurance coverage for weight-loss programs (Keenan, 2009).

\(^{3}\)The limited success of dieting may be due to an incomplete understanding of the factors that increase risk of obesity.
eating in response to a wide variety of events. These events disrupt self-control and often trigger episodic overeating that wipes out all the dietary achievements made since the last overeating episode.

The observation that initial dieting and weight loss success does not ensure continued success suggests that greater attention must be given to the factors that underlie dieters’ decision to maintain a pattern of successful diet behavior (Rothman, 2000, 2004). Why is it that people who are able to successfully initiate changes in their behavior have difficulty maintaining it over time? One possible answer is that people have self-control problems in the form of a present-biased preference. Present bias is normally expressed as a self-control problem, where one places extra value on a more immediate reward than a longer term reward. Present bias is viewed as an “error.” That is, it is a bias that can lead people not to behave in their own best interests. Our short-term inclinations about what to do often do not accord with our own assessment of what is in our long-term best interests—maintaining healthy diets. In general, present bias explains why many behaviors that undermine health involve immediate benefits (such as overeating) coupled with delayed costs (such as obesity). For example, present bias explains individuals’ poor decision making behind smoking and other preventable conditions, which contribute to 40% of premature deaths (McGinnis, 1999). Many preventable diseases and premature deaths could be prevented if we change people’s present-oriented behavior, particularly with regard to overeating.

**DETERMINANTS OF FOOD CHOICE**

This book is essentially about consumer behavior in the context of food choice; it aims to increase understanding of why we eat and how much we eat. Given that food choice is a product of both environmental and biological interactions, a full understanding of eating behavior should include both the internal biological signals and external environment contributing to food intake. One must also understand the role of irrational forces as well as rational causes of obesity. Behavioral economics demonstrates how flawed decisions and self-control problems can impact eating behavior. So we need to explore ways to improve decision making and health habits in order to improve health.

In general, eating behavior can be modeled as including four stages: exposure, purchase, consumption, and termination (e.g., Wansink, 2006). The first stage can result from cue exposure, such as the sight and smell of food when it is directly available, as well as internal factors, such as hunger signals, which regulate food intake. The second stage, purchase, involves individual choice, which is influenced by reward aspects of food, as well as
learning and memory process. This stage is also greatly impacted by the wide availability of unhealthy food, such as that found in fast-food outlets. The consumption phase includes evaluating the sensory aspects of the food, which form memories of its reward or aversion. The final stage is termination, which lasts as long as satiety signals prevail over competing external cues. This comprehensive perspective captures several pathways toward understanding individual eating behavior.

Food choice decisions are likely to be influenced by food prices, household incomes, the education and knowledge of decision-makers, tastes, and individual’s energy requirements. However, the amount of food we eat is also influenced by environment. For example, consumption norms (what is an appropriate amount to eat) are influenced (biased) by reference points, such as package size, plate shape, and so on. The influences of these cues often occur outside of conscious awareness. Think of going to a restaurant. We tend to believe that a typical restaurant portion size represents the appropriate amount to eat, when in fact it may be much larger than appropriate. People are also biased by the “health halos” that accompany labels and tend to overeat when foods are labeled as “low fat,” or perceived as healthier versus less healthy (e.g., Subway vs. McDonald’s). Research suggests that we eat more with our eyes than our stomach. Overweight people use more external cues (plate is empty) than internal cues (no longer hungry) to stop eating (Schachter, 1971).

When faced with food, people respond differently than when faced with other purchases. The desire for health and indulgence represents a clash. Consumers wish to satisfy seemingly contradictory desires. For example, in the face of the pleasure that Cinnabon promises, consumers suspend more rational thought and are drawn to the indulgence of it. The promised pleasure distracts from thoughts of a food’s fat or caloric content. These biases suggest that perhaps people do not need more nutrition information, but information about their own behavioral tendencies and how they may be more easily managed through decisions.4

Throughout this book, I will argue that increasing consumer well-being requires changing the personal environment. For example, serving food off the stove or counter (rather than at the table) reduces multiple servings a person consumes by 30% (Wansink, 2006). Being aware of errors/biases will not always help to avoid them, and relying on cognitive control and willpower is often disappointing. For some, it may be easier to change their environment than to change their minds. A personally controlled environment can help people more effortlessly manipulate their consumption and lose weight. Other examples include repackaging

4Most people know that an apple is better than a candy bar. Yet, people find maintaining a healthful pattern of behavior quite difficult.
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food into single-serving containers, or storing tempting foods in less convenient locations, and so on. Throughout this book, I will offer such examples that can help individuals control their eating behaviors.

A NEED FOR A MULTIDISCIPLINARY APPROACH

The understanding of eating behavior and obesity can be likened to the Buddhist parable of the blind men and the elephant. One blind man feels the tusk, inferring that elephants are hard and sharp-edged, like a blade. Another touches the soft, flexible ear and concludes that elephants are quite elastic. A third imagines massive strength from grasping the pillar-like structure of the leg. The perspective of each person touching the elephant is valid, as far as it goes. But no one understands the whole beast. Our scientific understanding of obesity will be more accurate if we take a multidisciplinary perspective.

The challenge of studying obesity is highlighted in Figure 1.1, which shows the critical role of various systems in shaping individual decision making and lifestyle choices. As shown, obesity can be studied on different levels, from individual genetics to social environment, and each level is the traditional domain of a different discipline. This means that a better understanding of obesity may require interdisciplinary approaches.

FIGURE 1.1 Levels of Analysis of Obesity

Environment

↓

Social influences

↓

Economics and market factors

↓

Individual psychology

↓

Neurochemical/metabolic factors

↓

Genetic factors
For example, a study of food prices provides an important explanation for the increase in obesity but does not explain why obesity appears to move through social networks. At the individual level, neurobiology may explain why some people prefer French fries to carrots. However, individual lifestyle choices are not completely independent of the social environment and norms. In short, the obesity epidemic results from a system with various parts that interact in a complex way that cannot be reduced to a single mechanism (Hammond, 2009).

This book attempts to use an interdisciplinary approach to better understand eating behavior and guide interventions to improve public health and overall well-being. It is designed to provide students with a foundation to explain why consumer food choices often conflict with their desire for good health and the barriers for making healthy diet choice by individuals. The discussions draw from several disciplines, including behavioral economics, nutrition, and public health, for understanding the relationships between a number of socioeconomic, nutritional, and behavioral factors on food intakes and health outcomes. Economics helps in understanding the role of food prices and household incomes on food consumption decisions. Psychology is interested in factors such as individuals’ motivation to change lifestyle, belief about health, and degree of self-efficacy for encouraging healthful eating (see Figure 1.2).

A BRIEF INTRODUCTION TO BEHAVIORAL ECONOMICS

The book utilizes behavioral economics as the overarching conceptual framework to discuss the root causes of obesity. This relatively new field blends insights from psychology and economics. Behavioral economics is a generalization of rational choice theory, which incorporates concepts
of rationality, willpower, and self-interest in a systemic way. The basic premise of behavioral economics is that humans are hard wired to make judgment errors and they need a “nudge” to make decisions that are in their own best interest. Behavioral economics provides a framework to understand when and how people make errors. Basic tenets of behavioral economics demonstrate that the environment plays an important role in eating and body weight regulation.

The traditional economic perspective relies on a “market” approach, in which individuals are assumed to be making autonomous decisions based on their own preferences, with a goal of maximizing individual satisfaction. However, many of these assumptions are inaccurate and simply do not fit what we know about individual behavior from public health. Human beings have limited cognitive abilities and limited willpower. Conscious and unconscious factors influence people’s decisions in ways that cause us to act against our own best interest. As will be discussed in later chapters, biases, gut feelings, and habits often compete with deliberate consideration of information. Although individuals may be aware of the factors contributing to obesity, their everyday lifestyle choices do not reflect this knowledge. Rather, these choices are often made in an unconscious and a more impulsive manner. Because of this, individuals frequently make decisions that depart systematically from the predictions of economists’ standard rational model. Behavioral economics attempts to understand these departures and, more generally, integrate psychologists’ understanding of human behavior into economic analysis. Identifying ways in which behavior systematically deviates from optimality can then generate new insights into the underlying choice mechanism.

Behavioral economics suggests that we cannot always rely on revealed preferences (what people actually choose) as a guide for personal well-being. Standard economics normally assumes that revealed preferences are identical to preferences that represent the person’s true interests. For example, when you choose chocolate over vanilla ice cream, you reveal a genuine preference for one flavor over another. However, there are many situations in which the choices people make do not reveal a true preference. For instance, several factors, such as passive choice, environmental cues, marketing, and present bias, tend to increase the gap between revealed and normative preferences. For example, people who eat popcorn at the theater tend to consume more than what they say they will eat, thus indicating a disconnect between revealed and normative preferences. The simultaneous prevalence of obesity versus the tremendous amount of money spent on diets and health clubs also reveals this disconnect. In situations like these, revealed preferences cannot be a reliable guide to normative preferences. The following chapters will describe factors that explain why our actual preferences deviate from our true preferences.
Chapter 1  Behavioral Economics and Eating Decisions

The body of literature discussed in this book illustrates the fact that satisfaction will not always be best achieved by allowing consumers to choose what they want, when they want it. Sometimes, people may be made better off by being given a restricted choice set, or by having their choices “guided” in the right direction. For example, many feel that the policy to ban smoking in public places is a good idea and has helped many people to quit smoking. In the context of food, consider the popularity of small snack packages, which help consumers control the amount of food they consume. Policies that eliminate problematic cues or promote counter-cues are potentially beneficial because they combat compulsive use while imposing a minimal inconvenience and restrictions on deliberate rational users. Moreover, self-control problems lead to internality (“harm to self”), which occurs when a person underestimates or ignores a consequence of his or her own behavior for himself or herself. Internality is one of the key rationales for public policy intervention in the context of addiction.

USING BEHAVIORAL ECONOMICS TO REDUCE OBESITY

As noted earlier, we often behave in ways that are inconsistent with our own stated desires. In the case of weight loss, we may tend to engage in overeating and fail to live up to some self-imposed ideal of eating behaviors. While individuals suffer from decision biases and self-control problems, they also have the capacity for self-regulation in a flexible and goal-directed manner through deliberate and effortful acts of willpower. This text will illustrate the usefulness of behavioral economics as a solution to problems that predictably arise from individual behavior. The discussion shows that many of the same decision errors that produce self-destructive behaviors can actually be used to improve an individual’s health.

Self-control problems refer to an internal struggle dealing with choice over time. For example, Thaler and Shefrin (1981) formulate self-control problems as pitting the long-term preferences of a “planner” (or long-term self) against the short-term desires of a “doer” (or short-term self). This can also be framed as conflict between immediate gratification versus long-range consideration. Thus, self-control problems may arise when strong desires temporarily block the long-term self’s ability to exert control over the short-term self. This formulation challenges the picture of the unified self as an optimizing single person. This means that there exists a gap between declared intentions and actual behaviors, where people seem to act against their best judgment. Successful use of self-control strategies allow individuals to choose differently than they would based on immediate preferences. In such cases, restricting an individual’s
choice is often a useful strategy to avoid temptation (e.g., placing alarm clock on the other side of the room so the person has no choice but to get up and turn it off and thus avoid oversleeping). In the context of eating behavior, Wansink (2006) demonstrates that when a jar of candy was placed within reach, participants consumed significantly more than the control group where the jar was placed 6 feet away.

**POLICY IMPLICATIONS**

There are two ways of thinking about influencing behavior. The first is based on the standard rational model. That is, influencing what people consciously think about by increasing knowledge and awareness (known as the *reflective system*). This approach assumes that the individual is a rational agent who surveys the situation to see what the various options are and then does a quick cost-benefit analysis of those options in order to choose. The second approach is to alter the context within which people act (known as the *automatic system*). This type of intervention is similar to the “nudge” outlined by Thaler and Sustein (2008), which often involves small changes to the choice environment. For example, one intervention tried to encourage school children to make healthier choices without alienating students by reducing their perceived choices. In a school cafeteria, what kids choose depends on the order in which the items are displayed (Thaler & Sunstein, 2008).

From a policy perspective, the issue is how to motivate people to perform and maintain behaviors that are in their own best interests but that can be bothersome or difficult to do, such as eating properly, exercising, and moderating bad habits. The policy goal is to transform the environment in which food choices are made into one that supports healthy lifestyles. By focusing on creating conditions that help individual choices and behavior, we come to an argument in favor of some paternalism. The main justification for paternalism is that people have self-control problems. People want to behave differently from the way they are inclined, and they are willing to pay for it.

Some health policy analysts claim that the twenty-first century will be the century of behavior change. An understanding of the forces that shape individual health behavior choices is an essential ingredient in the development of effective policy to promote obesity prevention. Focusing on key behavioral economic factors that explain eating behavior, this book offers perspectives on how these psychological and economic factors may influence maintaining healthy habits over the long run. Any policy aimed at changing how people eat has to account for how these
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decision variables might change and how people will respond to that change by altering their lifestyles.

CONCLUSION

Rational food decisions often involve trade-off between short-term gains of sensory pleasure and longer term gains of health and wellness. Findings from behavioral economics research suggest that even when people are motivated to make healthy choices, external constraints in the decision-making process can prevent them from choosing optimally. Most of us prefer immediately gratifying short-term pleasure over our long-term goal of eating healthy. The following chapters will discuss several reasons why people go astray when making food decisions. Errors in choices arise from systemic decision biases, emotion, and the limits of cognitive capacity.