Behavioral Economics, Food Assistance, and Obesity

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While there is mixed evidence of the impact of food assistance programs on obesity, there is general agreement that the food-insecure are at higher risk of obesity and obesity-related diseases. Food assistance programs, originally designed to overcome a lack of available food, now need to confront a very different problem: how to provide for the food-insecure while encouraging healthy lifestyles. This paper examines the potential to address these competing needs using traditional economic policies (manipulating information or prices) versus policies engaging behavioral economics and psychology.

Key Words: food assistance, behavioral economics, food insecurity, obesity

In describing the original goals behind the Food Stamp Program, Milo R. Perkins, the first administrator of the program, stated, "I got a picture of a gorge, with farm surpluses on one cliff and undernourished city folks with outstretched hands on the other. I set out to find a practical way to build a bridge across that chasm" (USDA 2005). Milo may have gotten a substantially different picture living in our day. While the prevalence of inner city and rural hunger motivated the first generation of food assistance programs, food assistance and food insecurity have become substantially associated with obesity.

For the years 1988 through 1994, Fox and Cole (2004) report an average age-adjusted body-mass index (BMI) for food stamp participants of 29.3 (a BMI of 30 or over is considered obese) as compared to 27.4 for income-eligible non-participants, and 26.1 for those who earn too much to be eligible. This gap has shrunk in recent years, mostly due to an increase in average BMI of non-participants. Food stamp participants and other food-insecure still hover, on average, just below clinical obesity (Ver Ploeg, Mancino, and Lin 2006).

The problem we now face is how to accomplish two seemingly opposing goals: (i) provide food for those who face substantial food insecurity, and (ii) lower the obesity rate among all Americans, but particularly among the poor. By emphasizing the increase in purchasing power, current policy may be contributing to the health problems of food assistance recipients. Within this paper, I argue for the use of more subtle policies that may be able to encourage better eating habits among those on food assistance, while providing greater ability to purchase. Additionally, these policies, based on behavioral economics, avoid interventions that would drastically affect individual choice, and thus participation rates. Behavioral economics has made a significant impact on the general economics literature, improving our ability to understand and explain behavior. Still, applied economists have yet to realize the untapped potential of using behavioral tools to achieve complicated policy goals through means that may be less patronizing or offensive to the subjects of the policy (or to those who fund it). In this case, subtle changes in policy can induce individuals to purchase healthier foods and eat more reasonable portions. I hope to illustrate how psychological principles can be combined with economic incentives to address the increasingly complex challenge of providing food assistance in the developed world. The policies I suggest in this article are new avenues for exploration in agricultural economics and should be the subject of further research.

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Why Behavioral Economics?

Behavioral economics combines models of rational economic choice with psychology-based models of perceptual distortions, cognitive biases, and rules of thumb. Behavioral economists have found that individuals tend to deviate from what is often termed rational behavior in highly systematic and predictable ways. For example, it is possible to cleverly construct a set of money gambles, *A*, *B*, and *C*, such that a majority of individuals prefer *A* to *B*, *B* to *C*, and *C* to *A* (Loomes and Sugden 1982). It appears that this happens because individuals use a particular set of decision shortcuts, or rules of thumb—often comparing only the money outcomes between gambles when the probabilities are similar, or only the probabilities when amounts are similar (Rubinstein 1988). A phenomenon such as this may be of marginal importance, unless discovered and exploited by some firm or individual (e.g., investment firms) for substantial profit. One criticism often leveled against behavioral economics is that most anomalies, much like optical illusions, happen only under rare circumstances. If anomalies are indeed rare, there is little reason to model them for most applications.

While behavioral economics has become widely accepted in general economics, few applied fields have embraced this philosophy. The most notable exception is finance. Behavioral finance has become a thriving and rich literature with many innovations and important results (see Shefrin 2000 for a review). Nonetheless, I believe behavioral anomalies may be of extreme importance in studying the economics of life's more mundane activities, e.g., eating. Financial markets are often thought to be driven by the decisions of highly paid and coldly calculating groups of individuals. If financial markets can be subject to large psychological biases, it is very likely that an individual almost unconsciously deciding how much of a bag of potato chips to consume while watching a highly anticipated football game might be subject to biases.

Before exploring the importance of psychology in food consumption, it is important to note the accomplishments of traditional economic models in this field. Economic approaches to food consumption and health generally suppose that individuals maximize utility of consumption of food, leisure, and other goods, subject to some constraint on time and income, following the Becker (1965) household production model, or

$$\max_{x,y,z,L} U(y,z,L)$$

subject to

$$y \le f(x, T-L)$$

and

$$p_x x + p_z z \le w .$$

Here $U(\cdot)$ represents utility as a function of food consumption, $y \in \mathbb{R}_+^n$, other consumption, z, and leisure time, L; $f(\cdot)$ is production of consumption foods as a function of time in preparation, $T - L$, and food inputs, $x \in \mathbb{R}_+^m$; T is total allocable time; p_x is a vector of prices for food inputs; p_z is the price of other consumption goods; and w is income. More detailed models may further specify a utility of food consumption that is dependent upon the nutrients of the foods consumed or the individual stock of "health," or allow for time-discounted dynamic choice.

From this model, it is possible to derive and estimate the substitution between food inputs or consumption items, price, wealth, and time elasticities of food demand. The first-order conditions can be solved for the food demand equations, $x(p_y, p_z, w, T; q)$, where q may represent a set of individual characteristics potentially including nutrition information. While such a model of food demand is informative and useful, it provides for a very limited set of public policy levers to combat perceived over-consumption. In particular, traditional models suggest that the only levers may be manipulating prices (e.g., a fat tax), manipulating income (perhaps curbing food benefits to the obese), or manipulating those characteristics in q that are moveable (e.g., through public information and advertising campaigns). I will refer to these levers as *traditional policies*. Beyond traditional policies, other more invasive policies suggested by this model might include directly reducing the choice set through the banning of some food substances (e.g., banning soda in schools) or limiting the sale of convenience foods. With regards to food assistance, these policies may include a reduced choice set for bene-

fits. I will regard these latter policies as politically infeasible.

Several studies have suggested that poor diets may be a simple result of price differences (e.g., Drewnowski and Darmon 2005). While real food prices have declined, it is hard to reconcile the notion that simple price fluctuations have caused the obesity problem with the commonly held belief that the elasticity of demand for food is very small. For example, using a simple utility model of food consumption, LaFrance (1999) estimates the effects of the U.S. dairy program on nutrient intakes. The dairy program has the overall effect of raising prices on fresh milk, while lowering prices on processed milk products. In accordance with the simple utility model, LaFrance supposes that this will lead consumers away from fresh milk, to fattier and less healthy processed milk products. His empirical analysis, employing data covering U.S. consumption from 1949 to 1994 suggests however that demand for milk products is very price-inelastic. Thus even though price changes were large, changes in nutrient intake for all nutrients associated with dairy products changed by less than 1 percent. The impacts of food price changes on consumers appear to have been more financial than nutritional.

It should not be terribly surprising that price has little to do with consumption. The majority of individuals live in multi-person homes. In a typical family, one individual may do the majority of the shopping, while all family members eat. The majority of individuals have no opportunity to observe changes in prices when making consumption decisions. Those that do may have little memory of small changes in prices by the time the food is consumed. It may require unreasonably substantial changes in food prices before casual eating behaviors are affected.

Alternatively, Chou, Grossman, and Saffer (2004) examined the effects of price and availability of fast food and other food sources on obesity levels. Employing the Behavioral Risk Factor Surveillance System for years 1984 through 1999, they estimate the price elasticity of body-mass index (BMI) for fast food restaurant, full service restaurant, and food-at-home prices to be -0.050, -0.022, and -0.035, respectively. Thus, at best, raising the prices on fast food by 50 percent should result in a loss of 5 lbs for an average height and weight male (slightly more for an obese individual). While the relationship between food prices and obesity is significant, it is also very small in magnitude. Availability of fast food, on the other hand, appears to play a much larger role in obesity. The authors find a much stronger relationship between the number of fast food establishments and obesity. This is suggestive that individuals may not be so deliberative when considering fast food, rather reacting to impulses when presented with an opportunity (e.g., while driving by a restaurant when one happens to have extra time).

Lancaster (1966) style models of food consumption have led many to explore the possibility of taxing fatty or sugary foods, and subsidizing more healthy fare (see, for example, Cash, Sunding, and Zilberman 2005, Schroeter, Lusk, and Tyner 2005). If consumption behavior, especially for the most fatty and sugary foods, is unresponsive to price, such policies will fail to improve diets substantially. Additionally, such a tax could have the unintended effect of transferring wealth away from those who have the least wealth to begin with.

One important line of economic research examines the impact of media and government health information on diet. There is some disagreement between the economics and marketing literatures regarding the impact of health information on consumption. The economics literature hypothesizes that health information is a significant determinant of consumption, and, thus, when new health information arrives, behavior incorporates this new information. Nayga (2000) estimates Becker's household model to determine the impact of health information and schooling on obesity. Nayga finds that those with a knowledge of the link between diet and disease are much less likely to be obese. Nayga also finds econometric models to be extremely sensitive to the inclusion of diet knowledge as an independent variable.

Many applied economists have attempted to analyze the impact of health information on consumers' perception by utilizing different health resources and health information sources in the United States and in European countries. Diverse conclusions were reached. For example, researchers focusing on U.S. studies find that health information is a significant and large factor in consumption, but EU data shows that this factor is negligible (Chern and Rickertsen 2003). Mean-

while, the marketing literature has concluded that health information plays little to no role in food consumption decisions, being far outweighed by concerns of price, taste, and ease of preparation (Asp 1999, Food Marketing Institute 1998). Some of this disparity might be due to the different types of information examined in the two literatures. While economists tend to look for the aggregate effect of any health information, marketing scientists have examined more specifically the effect of specific pieces of positive health information on individual consumption. Certainly some consumers are affected by the information, but in very different ways. By eliminating the restricted structure imposed by economists, the marketing studies consistently show little impact of health information (Nestle 2003). Indeed, Chang and Just (2004) find that information connecting eggs and cholesterol has no long-term impact on egg demand when economic models allow information to decay over time. Impacts of health information on average decayed entirely after one month.

In summary, there is substantial reason to doubt the effectiveness of traditional policies in changing long-term eating behavior. Low price elasticities, and the minimal impact of health information, lead me to believe other factors may be of greater importance. With respect to food assistance, Wilde, McNamara, and Ranney (1999) find that food assistance increases the consumption of all relevant nutrients, but also note many behaviors that cannot be reconciled with the standard economic model. For example, the average recipient spends his or her entire benefit and additionally some of his or her earned income on food each benefit period. However, providing individuals with an equivalent amount of cash results in less spending on food (Bishop, Formby, and Zeager 2000). These two behaviors are not possible to reconcile with optimizing behavior assumed in standard economic models. Further, individuals tend to spend their benefits at the beginning of the benefit period, and run out of food toward the end of the benefit period (Wilde and Ranney 2000), suggesting that individuals have little concern for consumption even in the near future. This is inconsistent with the common notions of reasonable time discounting found in the economics literature.

While these few anecdotes support the notion that food consumption may be subject to psychological biases, I argue that food psychology may play an integral role in consumption choices—both food types and quantity. While optical illusions may be rare in nature, a clever marketer may be able to manipulate packaging or other product parameters to create common illusions that result in increased profits. I offer two additional anecdotes in support of the importance of psychology in eating behavior. First, major food industry firms spend substantial amounts of money to explore the impacts of packaging, color, variety, and other cosmetic factors on consumption volume. Such spending by large methodical firms would be irrational if no real impact were present. I think it much more likely that the potentially distracted consumer is the less rational one. Second, we know that the U.S. diet industry takes in $40 billion in revenues each year. Dieters spend hundreds or thousands of dollars in an effort to reduce their consumption. This suggests that it is difficult or costly for them to reduce their consumption. Clearly, the obese did not deliberately and calculatingly choose to become obese. Rather, becoming obese is a surprise consequence of a large number of other choices. Each individual choice may have little lasting impact. Cutler, Glaeser, and Shapiro (2003) find that desired weight is inelastic relative to actual weight. Habits or an imperfect ability to resist constant temptation can accumulate long before the individual realizes there is a problem, or decides to do anything about it.

Given that many of an individual's food decisions are made casually, and almost subconsciously, it is highly unlikely that policies targeting rational and deliberative evaluation will have much of an impact. Traditional policies may fail to change the least rational decisions.

Food Psychology

Psychologists have experimented extensively with food consumption decisions. Here I summarize the most important principles of this literature. More thorough reviews of this literature can be found in Just et al. (2006) and Wansink and van Ittersum (2003). This summary will provide a background for the policy discussion in the following section.

Individuals tend to view goods in terms of a moral structure. Some goods are viewed as being virtuous, and others as sinful or extravagant. This may be of particular importance in food consumption where this moral structure may be reinforced by public information campaigns, and food or diet advertising. Kahneman, Knetsch, and Thaler (1990) found that individuals are willing to pay much less to acquire an item than they are willing to accept to part with the item once it is given to them. This endowment effect appears to interact with the type of good. Dhar and Wertenbroch (2000) find that utilitarian (or virtuous) goods are salient when choosing among goods to acquire, and that hedonic (or sinful) goods are salient when deciding which must be given up. In terms of diet, this suggests that individuals are much more willing to add good foods to their diet than they are willing to give up bad foods, making it difficult to reduce overall calorie intake.

Epstein (1993) describes the choice between "wants" and "shoulds" as a battle between rational thought and emotion. He proposes Cognitive-Experiential Self Theory (CEST) to model this battle. This model supposes that the individual evaluates each stimulus using two separate processes: (i) an experiential system is used to make rapid evaluations based on affect, and (ii) a cognitive process is used to make deliberative evaluations based on rational thinking. Epstein shows that which process dominates depends primarily on the availability of processing resources. These resources can include time, other distractions, and the volume of decisions that need to be processed, among others. Impulsive behavior can result from the presence of stress, time constraints, the presentation of food choices, or the sheer number of choices available. Shiv and Fedorikhin (1999) find that individuals are much more likely to choose cake than fruit salad when given a simple cognitive task to perform than when no task is given.

Surprisingly, preferences and taste appear to have less to do with the amount people eat than with environmental factors (see, for example, Wansink and Kim 2004). Wansink (2004) suggests that the external factors having the greatest impact on consumption volume are the eating environment (atmosphere, effort, social facilitation, and distractions) and the food environment (salience, structure, size, stockpiling, and shape). The eating environment refers to the attributes of the areas surrounding the individual as he or she eats. The food environment refers to the presentation of the food itself. Importantly, most of these factors affect consumption volume without the individual being aware of the effect (Wansink 2004).

CEST also plays a role in determining the quantity of food consumed. As individuals become distracted, they have less ability to monitor the amount of food they have consumed. This generally leads to overconsumption. Distractions that are known to increase consumption include conversation, reading (Tuomisto et al. 1998), watching television, listening to music, or watching sporting events (Poothullil 2002). For example, social gatherings tend to extend the duration of meals, leading to greater consumption (Bell and Pliner 2003). Thus, the larger the gathering, the greater the consumption (de Castro and Brewer 1992). The presence of others can affect consumption not only through distraction, but through the setting of social norms. When eating in groups, individuals tend to try to eat amounts similar to their peers (Birch and Fisher 2000, de Castro 1994). Additionally, the convenience with which food can be obtained can have a disproportionate impact on consumption quantity. Meyers, Stunkard, and Coll (1980) find that significantly more ice cream is purchased when the cooler door is left open than when shut.

The food environment can affect consumption through several separate mechanisms. First, the simple viewing of food can lead to unplanned consumption (Boon et al. 1998, Cornell, Rodin, and Weingarten 1989). This happens because viewing the food acts as a reminder of a pleasurable experience, and because viewing and smelling food actually induces the release of dopamine, stimulating hunger (Volkow et al. 2002). Wansink and Deshpande (1994) show that simply asking an individual to describe the last time they ate soup more than doubles the amount of soup consumed on average in the next two weeks. Similarly, having large quantities of a food on hand increases the consumption of that food significantly regardless of replacement cost.

Cosmetic differences in the food can also have a large impact. Offering a greater variety of foods (or perceived variety) increases consumption (Miller et al. 2000, Rolls 1986, Rolls et al. 1981). As

well, packaging can impact consumption by introducing simple consumption monitoring mechanisms. For example, individually wrapping items can dramatically reduce consumption (Wansink 2004).

People tend to eat more when they are presented with larger packages or portions of food (Diliberti et al. 2004, Rolls et al. 2004, Wansink 1996, Nisbett 1968, Rolls, Morris, and Roe 2002, Edelman et al. 1986). Doubling portion sizes increases consumption anywhere from 18 to 25 percent for meal-related foods and up to 45 percent for snack foods (Wansink 1996). Moreover, larger package sizes lead individuals to severely underestimate their consumption, ex post. Astonishingly, individuals will eat more when given larger portions even if the food is reported to be repulsive by the subjects (Wansink and Kim 2004). A general result is that individuals tend to focus on consumption volume when determining a stopping point rather than specific levels of nutrients or calories.

Here I have summarized a very small portion of the literature on food psychology and consumption volume. It is important to note how many of the cues that trigger consumption decisions are outside the control of the individual, or at the very least not commonly considered important to a healthy lifestyle. Clearly food marketers have many tools at their disposal, in addition to the traditional tools, to manipulate the consumption decisions of their customers.

Integrating Food Psychology into the Economic Policy Tool Chest

The behavioral tools described in the previous section are of a substantially different nature than the traditional tools employed in economic food policy analysis. I will use these tools, along with well-known results from the behavioral economics literature and more traditional economics, to suggest a set of policy options designed to reduce consumption volume for recipients of U.S. food assistance. Notable is the fact that most of my suggestions involve expanding the choice set of participants rather than restricting it. Additionally, it is worth noting that most of these suggestions are relatively modest in cost, often mimicking existing programs that have been found to be cost-effective.

The School Lunch Program

All children enrolled in a participating school, or approximately 90 percent of all school-age children, are eligible to participate in the National School Lunch Program (NSLP). Additionally, the School Breakfast Program is available to approximately three-quarters of all school-age children. The NSLP was enacted by Congress in 1946 after the large number of young men rejected from service in World War II for physical deficiencies was linked to childhood nutrition. The goal of the program is to ensure that every child in the United States has access to a healthy meal every school day.

The NSLP is mostly a subsidy, reimbursing participating schools for each meal served to children. If a household falls below 130 percent of the federal poverty level, they qualify for free meals, while those between 130 and 185 percent of the federal poverty level qualify for reduced-price meals. For 2004–05, schools were reimbursed $2.24 for each free lunch, $1.84 for each reduced price lunch, and $0.21 for full price lunches. Payments totaled $6.5 billion in 2004. In return for this subsidy, school lunches must meet some specific nutritional guidelines. The NSLP is a large program, endowing individual school districts with significant purchasing power. Often school districts negotiate for products or packaging to meet specific nutritional requirements.

NSLP is the food assistance program where behavioral policy tools may be most effective. This is because of the great control that districts are given over both the food environment and the eating environment. The ability to bargain for packaging and product attributes affords schools the potential to offer products designed specifically to induce thoughtful and healthy eating.

In terms of the eating environment, many things can be done to discourage unhealthy eating, without reducing the options available. Some simple solutions may be to move vending machines or dessert items to less convenient and less visible locations. Placing these items outside of the lunchroom and outside of the normal path of students will reduce salience and increase the mental and physical effort necessary to obtain the items.

Unfortunately, for most junior high and high schools, lunchtime provides one of the only opportunities for socialization. This can have the

unintended side effect of leading students to be distracted while eating and encouraging greater consumption. Manipulating the size and content of the groups eating together could be one simple way to encourage healthier eating, though it would increase the logistical problems associated with administering school lunches. Eating in smaller groups, perhaps in the classroom, may reduce the length of meals and thus reduce general consumption. In this case, teachers, the natural focal point of any classroom, could be used as models to manipulate the perceived socially acceptable level of consumption. Finally, it may be possible to incentivize shorter consumption periods. Students could be allowed to leave the smaller group after completing their meal for social time with a much larger group of students. One challenge facing schools is the need to curb eating by the growing number of overweight children, while simultaneously encouraging underweight or undernourished children to eat. It has been found that eating in groups generally reduces consumption by the overweight, and increases consumption for most others. Thus, schools should carefully consider the potential effects of lunchroom schedules.

School districts can more directly affect consumption through the packaging and content of the food sold. In particular, it should be possible to push for smaller serving sizes for most packaged foods sold (e.g., snack foods, flavored milk, bottled drinks). The size and shape of the trays can also be used to diminish food consumption in much the same way.

Just et al. (2006) suggest that schools offer prepaid lunch cards that can be used only for healthier items. Preliminary tests show that such a plan decreases the consumption of less healthy items by more than an equivalent increase in prices.[1] In other words, individuals exaggerate the option value lost when placing money on the prepaid card, inducing much healthier food choices. Such a plan would also provide parents with some control over their children's food choices. A restricted card could be offered alongside a general use card without diminishing the results for users of the restricted card. Thus, simple and cost-effective means that do not reduce the choice set or increase prices can induce healthier eating.

[1] The equivalent price increase is calculated from elicited discount rates for money on the prepaid card.

The Food Stamp Program

The Food Stamp Program (FSP) is the largest food assistance program in the United States. The primary objective of the FSP is to enable low-income families and individuals to improve their nutritional intake by increasing their food expenditures. The current program was made available nationwide in 1975. To qualify for participation, families must demonstrate that their income falls below 130 percent of the federal poverty level, a net income (after certain deductions) below 100 percent of poverty, and no more than $2,000 in countable assets for individuals under age 60. As benefits are linked to inflation and the poverty level, it is important to note that the rate of inflation on food products has not kept pace with the rest of the economy. Figure 1 displays the poverty level divided by the consumer price index (the straight line) and the poverty level divided by the food consumer price index. This figure shows that the ability to purchase food by those at the threshold for qualifying for the FSP has increased substantially over the last 30 years. Thus, one reason for the increase in overweightness and obesity among participants may be the changing demographics of participants, and the increased purchasing power of benefits as food has become relatively cheaper.

Food stamp benefits are distributed through the use of an Electronic Benefits Transfer (EBT) card. The EBT card can be used to purchase most foods. Exceptions include items such as alcohol, tobacco, and ready-to-eat meals intended for consumption outside the home. Non-food items cannot be purchased with the EBT card. The United States spent $270 billion on the FSP in 2004, serving approximately one-twelfth of all Americans (Economic Research Service 2005).

Employing psychological mechanisms in the FSP is a particular challenge given that the current program offers no direct control over either the food or eating environments. Also, strategies that further limit the number of items individuals can spend their benefits on would be highly

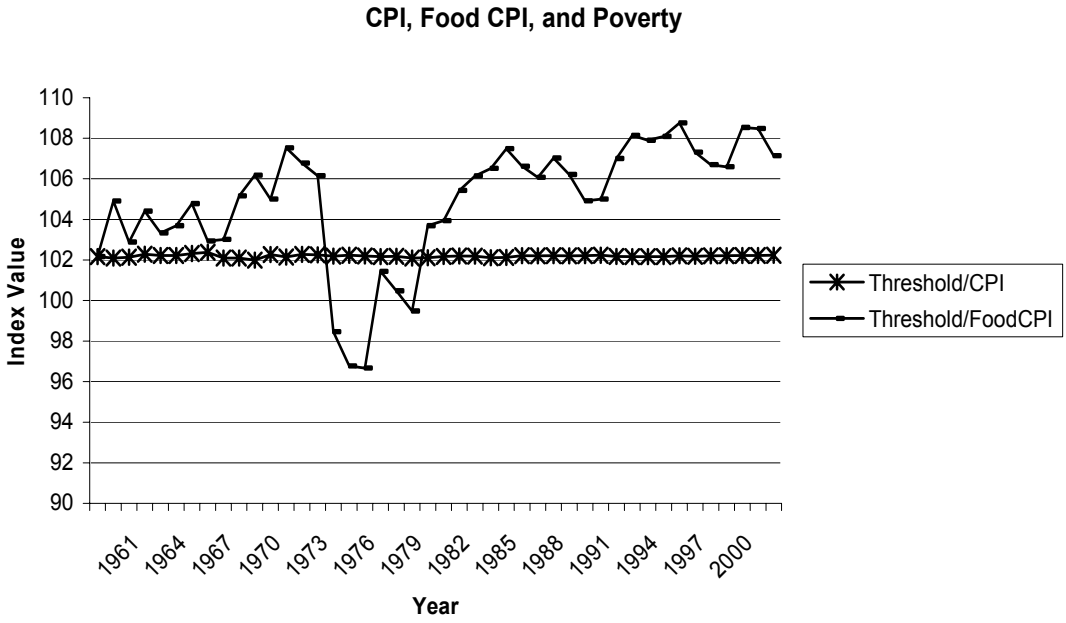

Figure 1. The Real Poverty Threshold as a Percentage of Consumer Price Index and Food Consumer Price Index

unpopular and could significantly alter participation rates.

Wilde and Ranney (2000) show that food stamp recipients consume more food just after benefits are dispersed. This is highly consistent with Laibson's (1997) notion of quasi-hyperbolic discounting. Quasi-hyperbolic discounting occurs when individuals discount time in the near future at a much higher rate than time in the more distant future. This will result in time-inconsistent behaviors like procrastination, failure to plan, and regret. Such behavior could be overcome if benefits were given more frequently. Allowing individuals to opt for more frequent benefit transfers provides a commitment device that would allow them to save and plan for the future without temptation. Further, this could reduce the stockpiling of food at the beginning of benefit periods, reducing overconsumption during this period.

Like the school lunch program, the FSP controls considerable market power. However, this power is currently completely dispersed among participants. This market power provides an opportunity to expand the number of healthy choices available to low income individuals. While many healthy foods are generally cheap, foods tend to be cheapest when sold in large packages leading to less restrained eating. Individually packaging a serving can enable consumption monitoring and reduce overall consumption. Currently, food marketers can engage in price discrimination only by offering a choice between cheaper (per quantity) large packages and more expensive smaller packages. With a twelfth of consumers, it may be attractive to allow food marketers to price-discriminate based on food stamp participation for products meeting certain healthy packaging standards. The USDA could offer some certification based on the amount of food individually wrapped in a package, and potentially other health-oriented attributes.

One way to encourage the eating of healthy portion sizes without reducing benefits would be to allow the purchase of foods designated ready-to-eat. Foods could be chosen by portion size or other nutritional content. Certification provides two potential benefits to consumers. First, certification provides information to non-participants as well as participants—a potential tool to educate consumers about the psychological biases common in food consumption. Second, certification standards are likely to lead manufacturers to

shape the marketing strategies of food producers, leading to a greater number of smaller portion packaged foods available on the market.

Basic economic principles tell us that allowing price discrimination in this manner would lower the price for FSP participants, nominally increase the price to others, and increase the profits of the food marketers. By increasing the number who can consume foods designed to be eaten in healthy quantities, this clearly increases overall welfare (Hausman and MacKie-Mason 1988). A more aggressive policy might negotiate the discount received by participants on healthy packaged items, seeking to maximize total welfare. This process could operate similarly to that currently employed to negotiate discounts on formula for the Special Supplemental Nutrition Program for Women, Infants and Children (WIC).

Finally, allowing participants to use benefits to purchase ready-to-eat meals, or even restaurant meals, certified to contain a reasonable portion, could decrease the amount of food consumed. Such a policy would increase the options available to food stamp participants, as well as offer additional incentives to control the food environment and potentially the eating environment. The USDA could establish guidelines for portion sizes or caloric content for ready-to-eat meals and certify the products, allowing FSP participants to buy meals that meet these guidelines. A more aggressive policy could allow the use of benefits at restaurants whose eating environment meets a minimum set of standards. The purchasing power of food stamp benefits is attractive to food retailers. Extending the benefits in the right way could have tremendous impacts on the types of foods available in the marketplace. Further, by making the right meals easily available to FSP participants, the program can encourage better eating habits with little added expense and no additional prohibitions for participants.

The Special Supplemental Nutrition Program for Women, Infants and Children

The WIC program is a major provider of food and nutrition assistance. It is estimated that WIC serves nearly half of all infants in the United States, and a quarter of all children ages one to four (Oliveira and Prell 2004). WIC provides food and nutritional education, advice, and health care referrals to pregnant women, mothers of infants, and children under 5 who qualify. To qualify, a household must earn less than 185 percent of poverty and reside in a participating state, and a health care professional must determine that the individual is at nutritional risk. Typically, participants receive vouchers for specific foods (cheese, milk, cereal, etc.) that they can redeem at retail outlets. Food packages are determined by the age of the children participants and by whether the mother is pregnant, breastfeeding, or bottle-feeding.

While entrance to the WIC program is contingent on finding a specific health risk due to nutrition, food packages have little connection to the actual risk identified. In this case it seems reasonable to prescribe different food packages for those at risk because of obesity and those at risk because of under-nutrition. In particular, it seems that overweight individuals ought to be given less calorie-dense foods than other individuals. Specifically, it may be important to put convenient yet low energy foods in the hands of overweight participants (e.g., snack-sized packages of baby carrots). Increasing the convenience of foods can disproportionately increase consumption of them.

Secondly, vouchers could be given that are good only for smaller packaged items. Currently, many programs (e.g., in California) provide vouchers for several large boxes of cereal. The stockpiling effect can be compounded when manufacturers run two-for-one bill-back trade promotions. These common promotions allow all consumers to reduce the average price of consumption if they buy two boxes. During these promotions, participants would be encouraged to purchase two boxes of cereal for each allowed by the voucher. Stockpiling large quantities of cereal increases consumption considerably. Such interactions between food marketers and food assistance are not well understood, and deserve further examination.

Finally, Just et al. (2006) suggest that WIC may be able to influence consumption monitoring by giving participants glasses, cups, or plates that are designed to exaggerate the size of the portion placed on them. Wansink (2004) describes how tall glasses (rather than short and wide glasses) can reduce consumption volume. Individuals tend to focus on the height rather than width when

judging volume. This creates the possibility of offering the individual greater control of the food environment, with possible positive health effects.

Conclusions and Directions for Research

While the potential to use food psychology in food assistance policy exists, several challenges must first be overcome. Very little is known about how eating behaviors interact with prices and other traditional mechanisms. Thus, while initial evidence suggests the usefulness of behavioral policies, their true effectiveness is a mystery. More work must be done to measure the effects of behavioral mechanisms on the functioning of food assistance programs. The goals of this research should be to calibrate the effects of offering behavior-targeted options, determine the cost-effectiveness of such options, and evaluate the tradeoffs in costs, benefits, health, social stigma, and membership for traditional policies offering similar behavioral changes.

It is difficult to argue the importance of policies targeting willpower, underestimation of quantities, or decisions made in haste. There are, however, some precedents for the banning of certain money-making schemes (such as pyramid marketing or certain investment vehicles) or the regulation of walk-away periods for many contracts. More research into the relationship between behavioral-based marketing and the consequences it may have on unsuspecting consumers may highlight the need for such policies in the food industry. Clearly, food assistance must strike a delicate balance between the nutritional minimums of the participants, participant behavior, and the motivations of the food marketers, which may be perverse. I argue that, currently, the mechanisms are not in place to strike this balance. Rather, traditional mechanisms used for food assistance may increase the ability of food marketers to leverage behavioral anomalies.

For consumers in general, current policy on food marketing concerns primarily the truthfulness of the health claims made on packaging. Ironically, truthful claims may often mislead consumers into thinking that items that have "less fat" are necessarily better than their normal-fat counterparts—even if sugar or other items have been added to compensate. Despite the evidence that smaller packages can lead to healthier portion sizes, marketers are currently forbidden from advertising such a fact.

The current prevalence of overweightness and obesity in the United States has prompted many policy discussions. If much of eating behavior is determined by reflexive behaviors and decisions made with few cognitive resources, it is unlikely that policies designed to appeal to highly rational and cognitive thought will have much of a positive effect. Before policies can be designed and implemented that may more effectively target the type of thoughtless behavior that many believe leads to obesity, much work remains to be done.

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