

HOW FAR DO YOU HAVE TO GO TO GET A CHEESEBURGER AROUND HERE? THE REALITIES OF AN ENVIRONMENTAL DESIGN APPROACH TO CURBING THE CONSUMPTION OF FAST-FOOD

Christina A. Lydon¹
Kerry D. Rohmeier
University of Nevada-Reno

Sophia C. Yi
Loyola University Chicago Stritch School of Medicine

Mark A. Mattaini
*Jane Addams College of Social Work
University of Illinois at Chicago*

W. Larry Williams
University of Nevada-Reno

ABSTRACT: Recently, researchers have linked the availability and popularity of energy dense fast-foods to an increasingly obesogenic environment. Such availability has led to both over consumption and under nourishment, especially in lower income neighborhoods that fail to offer healthier alternatives. These “food deserts” play their part in both the increasing trend of obesity and the climbing costs associated with treating obesity-related disorders. In order to address this issue, food environments could be engineered by employing creative zoning in at-risk areas. Zoning allows municipalities to support developments that promote health, safety, and public welfare; in this context, zoning law could be utilized to support healthy, and more affordable, lifestyles. However, there is currently a lack of both empirical and public support for such an intervention on any scale. These issues could be addressed through the utilization of convenient pilots and the formation of relationships with target communities, culminating in the implementation of small-scale designs and, ultimately, large-scale intervention studies. In doing so, a foundation may be built upon which the development of a legitimate, environmental design approach to targeting obesity may be feasible.

KEYWORDS: fast-food, obesity, community-wide intervention, zoning, public health

¹ Correspondence concerning this article should be addressed to Christina A. Lydon, Department of Psychology, University of Nevada-Reno, 1664 N. Virginia Street Reno, Nevada 89557. Email: christina.lydon@gmail.com

ENVIRONMENTAL DESIGN AND FAST FOOD CONSUMPTION

Many would describe the increasing incidence of obesity in the US as nothing short of an epidemic, and most researchers (although not as many citizens) agree that this dangerous trend is primarily due to environmental factors. The ready availability and popularity of energy-dense foods among the public in the form of “fast-food” has likely contributed to an increasingly obesogenic environment (Block, Scribner, & DeSalvo, 2004; Bowman, Gortmaker, Ebbeling, Pereira, & Ludwig, 2004; Kestens & Daniel, 2010). This increased caloric consumption along with the increasing tendency to be involved in sedentary activities, such as watching television and playing video games, rather than more active pursuits often results in a positive energy balance that underlies the growing obesity problem (Powell, Han, & Chaloupka, 2010).

Effects of Fast-Food on Health

Fast-food is defined as, “of relating to, or specializing in food that can be prepared and served quickly; designed for ready availability, use, or consumption and with little consideration given to quality or significance,” (“fast-food,” Merriam-Webster Online, 2010). This definition is generally considered to include such establishments as corner stores, coffee shops, and franchised take-out restaurants. While serving speed is officially what makes food “fast”, the term “fast-food” employed here refers more to its colloquial usage as a label for unhealthy, accessible, and inexpensive food options that are quickly delivered and immediately consumable. Habitual consumption of such fast-food affects health in several ways. First, it plays a part in the support of a positive energy balance that is converted into fat. Ebbeling, Pawlak, and Ludwig (2002) note that there are several characteristics of fast-food that may contribute to excessive weight gain, including, but not limited to, increased portion size, taste enhanced by increased fat, sugar, and salt, a high content of saturated and trans fats, a high glycemic load, and low levels of fiber (Newby, 2007). These characteristics lead to menus filled with foods that are as tasty as they are fattening, which continue to be consumed at increasing rates.

Guthrie, Lin, and Frazao (2002), for example, found that consumption of fast-food in children and adolescents was five times higher in the mid-1990s than it was in the 1970s, increasing from 2% of total calories consumed to 10% of calories consumed. Pereira et al. (2005) report that a 15-year longitudinal study examining the effects of fast-food consumption shows that individuals who ate fast-food often at both baseline and follow-up were an average of 4.5 kg heavier than those who did not, a finding that was independent of other potentially confounding variables like physical activity or television viewing. Furthermore, Jeffery and French (2008) report that there is a direct correlation in women between the number of fast-food meals eaten per week and body mass index (BMI), a measure of health and obesity.

The consumption of energy-packed foods changes the waistline of Americans. Overweight and obese individuals continue to eat despite the negative repercussions on their health. This insensitivity to adverse consequences is a hallmark of people who are addicted to drugs. In a study by Johnson and Kenny (2010), rats fed a diet of energy dense food (i.e., bacon, cheesecake, chocolate) had increasing brain-stimulation reward elevation, and thus decreased sensitivity of the reward system, much like those on heroin and cocaine. They thus concluded that “overconsumption of palatable food triggers addiction-like neuroadaptive responses in brain reward circuits and drives the development of compulsive eating” (p. 1).

Additionally, eating fast-food generally decreases the likelihood that a consumer will meet accepted recommendations for daily nutrient intake. While a diet of fast-food tends to increase

consumption of energy-dense choices like soft drinks, hamburgers, and fries, it also displaces healthier food choices, such as milk, fruits, and non-starch vegetables. In doing so, consumers are eating high levels of fat, saturated fat, sodium, cholesterol, sugar, and simple carbohydrates and failing to consume adequate levels of nutrients such as vitamins A and C, folic acid, fiber, and calcium (Bowman et al., 2004; Demory-Luce, 2005; Jeffery, Baxter, McGuire, & Linde, 2006; Newby, 2007; Powell et al., 2010; Sebastian, Enns, & Godman, 2009) which can lead to health problems such as blindness, osteopenia, diabetes, and decreased wound healing.

Food Demographics, Availability, and Accessibility

Individuals who consume fast-food typically report that they do so because it is convenient; good taste, accessibility, and cost are often cited as factors in the decision to eat fast-food (Cannuscio, Weiss, & Asch, 2010; Newby, 2007; Rydell et al., 2008). Fast-food is becoming more readily available; in 1997, only 17% of all restaurants were fast-food establishments whereas in 2006 they constituted 30% (Powell et al., 2010). The drive-through experience is getting faster and more efficient, and preparing food at home is occurring less over time. While it takes an average of only two-and-a-half minutes to order and receive a meal from the drive-through (Karimi, 2007), it takes an average of 28 minutes to prepare a meal at home (Stockmyer, 2001).

According to The Residential Energy Consumption Survey, which collects data on household characteristics and residential energy consumption, cooking trends across all households have changed. In 1993, 35.9% of households were cooking two or more meals per day whereas only 3.8% were cooking once a week or less. In 2001, only 32.1% of households were cooking two or more meals per day while 7.1% were cooking once a week or less (Stockmyer, 2001). While taste and the increased risk of obesity that comes with it have been discussed, the availability of convenient access to fast-food and the effects of such availability on eating habits, as well as the influence of cost on specific groups, also need to be considered.

Where Fast-Food Lives

Low- to middle-income neighborhoods have 1.25-1.3 times more fast-food restaurants than their higher-income counterparts, according to a study by Powell et al. (2010). Additionally, lower-income areas are more likely to have these establishments closer to schools. In fact, these areas were more than 10 times more likely to have a fast-food establishment within 750 meters of a school than higher-income areas (Kestens & Daniel, 2010; Powell et al., 2010). In 2008, Simon, Kwan, Angelescu, Shih, and Feilding found one or more fast-food establishment(s) located within 800 meters of every Los Angeles County Public School. Additionally, in areas dominated by commercial land uses, the proximity of fast-food establishments to high schools was found to be inversely related to income levels. Although we are unable to correlate the presence of fast-food establishments and student dietary choices directly, a University of Pennsylvania survey reported that 50% of elementary to middle school-aged-children visited a fast-food establishment before school, 48% visited a fast-food establishment after school, and 38% visited a fast-food establishment both before and after school; on average, each of these visits amounted to 400 consumed calories (Cannuscio et al., 2010). Furthermore, Davis and Carpenter found via a 2009 geographic public health study of over 500,000 California youth that

ENVIRONMENTAL DESIGN AND FAST FOOD CONSUMPTION

students attending schools located within a half-mile of fast-food establishments consumed fewer fruit and vegetable servings, more soda, and were more likely to be overweight or obese than those attending schools located further from fast-food establishments.

In addition to income, researchers report that ethnic variables are also correlated with the presence of accessible fast-food. Although it seems restaurants in general are less prevalent in minority areas, Powell and colleagues (2010) report that of the available restaurants, a high proportion of them were considered fast-food. Evidence suggests that low-income and non-white individuals consume more fast-food, and that convenient access to such establishments is correlated with increased consumption of these products (Block, Scribner, & DeSalvo, 2004).

Food Deserts

Increased consumption of fast-food in these communities may be fueled by a lack of healthier alternatives. According to a study by James, Nelson, Ralph, and Leather (1997), members of lower socioeconomic groups have diets with fewer fresh fruits and vegetables as well as more meat products, fats, and sugars than those individuals belonging to higher socioeconomic classes. This appears to be related to the fact that many of these individuals live in what are often described as “food deserts,” areas lacking access to fresh, healthy foods whose food service needs are instead met by that which is available at corner markets and franchise restaurants (Sturm & Cohen, 2009). For example, the town of Altgeld Gardens in Illinois has a population of 3400 people but has not “...had a grocery store for six, seven years.” Instead they rely on the local liquor store and fast-food restaurant to buy food (Chicago Public Media, 2010). Additionally, the availability of supermarkets in minority neighborhoods, where healthier foods could be purchased, is roughly one-third to one-half of what is available in white neighborhoods, which limits these populations’ access to healthy choices (Powell et al., 2010).

Paying For It

There are few options in these areas for purchasing fresh foods, and even fewer in which such foods are affordable. Powell et al. (2010) report that from 1990-2007, while the prices of healthy, fresh foods remained about the same, the price of fast-foods and soft drinks fell 12% and 32%, respectively, with a concomitant increase in portion size. While it is arguable that fast-food meals really are cheaper than making an equivalent meal at home, the perception is that they are, and they have the added benefits of being close, easy, and fast. In this way, lower- to middle-class individuals and families are again more susceptible to the lure of fast-food than those with more disposable income because they are the most price sensitive (Powell et al., 2010). Newby (2007) argues that it is this combination of variables, specifically the accessibility of affordable energy-dense food of lower nutritional quality, that contributes to the higher rates of obesity and health disparities among both minority groups and the poor (Drewnowski & Specter, 2004).

Zoning as Environmental Design

While the need for urban planning arose out of 19th century public health initiatives, over time, the two disciplines’ roles diverged. Today, however, both planning and public health professionals recognize that land use and community design decision-making indeed affect

overweight and obesity rates and incidence of chronic illness. Singer explains that zoning powers are generally granted by the states to municipalities, allowing each to regulate building in the interest of health, safety, and public welfare (as cited in Davis, 2008). Zoning can, and has, been utilized for creative purposes in the past in the name of public safety, economics of an area, community need, and aesthetics (Davis, 2008; Mair, Pierce, & Teret, 2005a; Mair, Pierce, & Teret, 2005b). This authority is protected by police powers, which is the capacity of states to regulate for the promotion of public health, safety, morals, and welfare (Davis, 2008). Zoning, the key regulatory tool of planning professionals, is defined as:

The legislative method of controlling [land use](#) by regulating such considerations as the type of buildings (*e.g.*, commercial or residential) that may be erected and the [population density](#). Applied primarily to urban areas, it is accomplished by dividing land area into zoning districts, each having specific conditions under which land and buildings may be legally developed and used. In combination with other city-planning techniques, zoning is a major instrument for gaining greater physical order in cities (“zoning”, Encyclopedia Britannica Online, 2010).

Given zoning’s responsibility and power to legislate based on what is seen as best for residents’ health (Davis, 2008; Goston, 2007; Mair et al., 2005a; Mair et al., 2005b), some municipalities have begun enacting zoning restrictions on fast-food businesses. For example, in 2008, legislation was passed in South Los Angeles, California, banning the building of new fast-food establishments for a given period of time (Kurutz, 2008). In essence, these municipalities are proposing an environmental design approach to curtailing intake of fast-food by limiting accessibility and supporting the physical health of residents.

In 2004, Lehman and Geller described environmental design as an antecedent manipulation which changes behavior by introducing particular stimuli into, or removing particular stimuli from, an environment. For example, in 1980 Geller, Brasted, and Mann demonstrated that aesthetically pleasing waste receptacles placed in convenient areas decreased littering and increased litter pick up (as cited in Lehman & Geller). Essentially, this was an intervention based on established discriminative stimuli. Given an occasion upon which a particular behavior would be reinforced, such as throwing away a cumbersome item, a waste receptacle would likely occasion a throwing-away response, which would be maintained by the negative reinforcement of disposing of the unwanted item.

The increased opportunity to behave that served as the solution in Lehman and Geller’s (2004) littering study is actually part of the problem when discussing the consumption of fast-food. However, if there were fewer fast-food restaurants, then some of the most salient discriminative stimuli for consuming fast-food would be less prevalent. If an individual does not encounter the smell of the food or the sight of the restaurant with pictures of the food plastered on the windows, these stimuli cannot occasion the purchase and consumption of those products. Additionally, those individuals in the area who are hungry and looking for somewhere to buy food may forego a trip to a fast-food restaurant if it is no longer conveniently located. Increasing the response effort associated with obtaining fast-food in this way may increase the likelihood of healthier alternatives, such as preparing food at home or purchasing healthier foods.

Those in support of this type of legislation note that this process will only be worth the effort if it induces real change in the behavior and health of the individuals living in these

ENVIRONMENTAL DESIGN AND FAST FOOD CONSUMPTION

municipalities (Kurutz, 2008). While the idea has promise as an antecedent intervention, there are some concerns that should be addressed before an intervention like this one is disseminated on a large scale. The reality is that the technology of environmental design, as applied to fast-food through zoning, may not yet be advanced enough to achieve the “real change” that supporters are hoping for. Unfortunately, a failure now could limit the chances for success, or even implementation, of a well-developed environmental design intervention in the future.

The Application of Zoning Laws to Fast-Food Establishments

Rationale

To respond to critics, many fast-food establishments have begun to include more healthful items in their menus. While this has increased the number of healthy items people purchase, it has not seemed to curb customer’s appetites for other, less healthy items (Dipietro, Roseman, & Ashley, 2004), and as such has failed to address the problem that legislators are attempting to solve (Good and Hungry, 2010). Other attempts have been made as well, including a move to remove the toy from children’s meals (Good and Hungry) and requiring the conspicuous disclosure of nutrition facts for menu items (Goston, 2007). Recently, it has been suggested that an attempt to intervene effectively on fast-food consumption on a large-scale may need to include alterations to the built environment as well (Goston, 2007).

Goston (2007) notes that while many people feel that it is not the job of the government to impose its ideals and regulations supportive of those ideals on the public, there is a legitimate financial basis for intervening on the alarming increasing trend of obesity among Americans. In the 1990s, the prevalence of obesity increased in every state, and holds at over 20% of the adult population in every state except Colorado (Levi, Vinter, St. Laurent, & Segal, 2008). Following this increase, obesity-attributable medical expenditures topped \$75 billion dollars in 2003, a cost which does not include revenue lost due to decreased productivity from related illness (Finkelstein, Fiebelkorn, & Wang, 2004). Recent projections indicate rapid escalation of these costs over the next few years. If current trends continue, by 2018 about 103 million American adults will be considered obese, costing the US a minimum of \$344 billion dollars a year on health care costs attributable to obesity (United Health Foundation, the American Public Health Association & Partnership for Prevention, 2009), or roughly 45% of the US budget deficit projection for 2021 (Congressional Budget Office, 2011).

While some make the point that these costs could, and should, be the responsibility of those suffering from obesity-related illness, the medical system is not designed that way. Instead, taxpayers finance about half the costs through Medicaid and Medicare, and employers cover most of the rest (Goston, 2007). Given that the lower-income and minority populations who utilize government-sponsored medical assistance are more likely to suffer from obesity-related diseases such as type 2 diabetes, coronary artery disease and hypertension, the government, along with the public in general, has become financially liable for the apparent obesity epidemic. However, because the costs will be shouldered by the federal government, these aversive consequences will not fall directly upon the municipalities that control zoning. It may be more cost-effective for the federal government to provide monetary incentives to municipalities that

zone for healthy food environments; if designed correctly, such incentives would be less costly than medical care and could reinforce the participation of municipalities.

In their “City Planner’s Guide to the Obesity Epidemic,” Mair et al. (2005a) list several findings that could support limiting fast-food consumption and, by extension, the obesity and health problems related to it. First, the growing number of obese must be considered an epidemic; in 2008, obesity rates increased in 37 states and remained constant in 13 (Levi et al., 2008), and obesity contributes to an estimated 350,000 deaths every year (Flegal, Graubard, Williamson, & Gail, 2005; Mokdad, Marks, Stroup, & Gerberding, 2004; Mokdad, Marks, Stroup, & Gerberding, 2005). The medical costs associated with this trend are increasing at a rate sufficient to threaten the national economy (Goston, 2007; Levi et al., 2008) as the prevalence of obesity continues to rise. Obesity in children and adolescents is a concern as well, especially as obese children with poor eating habits tend to become obese adults suffering from obesity related illnesses, often at very early ages (Demory-Luce, 2005; Hill & Trowbridge, 1998; Keller & Heymsfield, 2003).

Mair and colleagues also mention characteristics of fast-food and the way it is served as justification for this type of legislation. Increased portion sizes (Newby, 2007) filled with high levels of over-consumed nutrients like sugar, fat, and carbohydrates (Bowman et al., 2004; Demory-Luce, 2005; Jeffery et al., 2006; Newby, 2007; Powell et al., 2010; Sebastian et al., 2009) that people are eating more frequently (Bowman et al., 2004) need to be regulated, proponents of regulation argue, in order to protect public health, especially in low- and middle-income communities. Additionally, it can reasonably be argued that zoning could be used to bring new, healthier choices to areas in need, which is important given research that suggests that those who live in areas where such choices are available tend to eat, and be, healthier (Cheadle et al., 1991; Morland, Wing, & Diez Roux, 2002; Powell et al., 2010).

By approaching obesity prevention as a public health goal (“Healthy People 2020”, 2010), it would be difficult for the fast-food establishments to argue against zoning to combat obesity. Mair et al. (2005b) note in their comprehensive guide entitled, “The Use of Zoning to Restrict Fast Food Outlets: A Potential Strategy to Combat Obesity,” that:

...[given] what is now known about diet and obesity, it would be difficult for a fast food developer to suggest that a fast food outlet is reasonably necessary for the public health. The same developer would likely find it difficult to show reasonable necessity for the general welfare—especially in localities that already have one or more fast food outlets or in localities that regulate fast food businesses for reasons other than for public health objectives (p. 68).

By contrast, the same legislation that limits fast-food by supporting public health will be in favor of healthy food retailers who wish to place establishments in areas in which their presence will likely add to a healthier food environment. In this way, these retailers can gain an advantage by meeting a very important need within “food desert” communities and providing healthy alternatives to those living there (Mair et al., 2005b). Zoning laws, then, have the potential to serve public health in two related, but individually significant, ways: by decreasing the prevalence of fast-food and its overall consumption within communities, as well as providing opportunities for the development of a healthier food environment.

Types of Zoning and Past Utilization of Similar Laws

Mair et al. (2005a & 2005b) suggest several types of zoning that may be particularly useful in limiting fast-food consumption.

Conditional zoning. Conditional zoning occurs when a piece of land is rezoned for a more specific use, which is expressed by stating that either only specified uses are allowed on the land or by prohibiting certain uses of the land. For example, a residential site could allow houses, supermarkets, and sit-down restaurants, but not allow fast-food establishments. Conditional zoning is generally allowed as long as it is in the public interest and not the interest of any specific individual or collaboration.

Incentive zoning. Incentive zoning allows areas to encourage the building of specific amenities within a given community. In this process, land incentives are provided to any developer who is willing to develop a piece of land to include specific, predetermined characteristics. This process is similar to contract zoning, an illegal action in which the zoning action “appears to be part of a bargaining process, in which the government agrees to rezone a piece of property in exchange for a specific promise or performance from the developer,” for the good of the government and the developer (Mair, 2005b, p. 23). To avoid charges of contract zoning, this process must be for the benefit of the public, which would be evident if municipalities used this technique to support the creation of healthier food environments by providing incentives for those willing to build establishments that support healthy diets. For example, a municipality may allow the development of an extra store within a strip mall with the provision that one of the stores in the mall be a supermarket or health food restaurant.

Performance zoning. Performance zoning sets standards for the use of the land, which require anybody using that land to meet them. Standards could relate to pollution, noise, odors, vibration, or any other procedure or product of a particular establishment. These types of zoning laws could limit the fast-food establishments near schools or homes on the grounds that the smells, sights, and sounds coming from the businesses would be distracting and/or unwanted by the public. Additionally, these types of zoning laws could be adapted creatively to support some of the other current approaches to regulate fast-food consumption. For example, they could require a minimum number of healthy items on a menu, or specify that all nutrition information be conspicuously available to consumers. In this way, these laws could influence health by influencing specific fast-food establishments and their practices, or perhaps discouraging them from building in a given spot in the first place.

Smartgrowth. Mixed-use zoning is an alternative to traditional zoning that can promote healthier cities through the built environment. Smartgrowth ordinances aim to compact growth of urban areas by encouraging mixed residential housing densities and types, while promoting transportation alternatives and conservation of open space to deter outward city expansion, or sprawl. Unlike traditional zoning techniques which relegate a single allowed use to a single parcel, mixed-use zoning allows for flexibility in multiple uses per parcel. For example, a building which houses commercial businesses on the ground level with either office and/or residential uses found on the floors above would be a result of mixed-use zoning. Mixed-use ordinances emphasize building design and siting linked to transportation corridors, placing equal emphasis on pedestrians, bicyclists, and automobile users. With the primary focus on urban forms, not uses, building setbacks are diminished and buildings are placed adjacent to one

another along street frontages connected by sidewalks, plazas, and public spaces. Automobile parking, often reduced by regulatory codes, is concealed behind buildings or in parking garages. Given limited parking conveniences and strict regulation of drive thru facilities in such designed spaces, sit-down establishments or other healthier food choices are encouraged.

Possible applications

There are some options that can be pursued using the aforementioned zoning techniques. First, a municipality could decide to ban all fast-food from a particular area. According to Mair et al. (2005b), this could be accomplished to some extent in several different ways. First, a specific provision in the zoning code could prohibit the building of fast-food establishments anywhere in the area or ban fast-food with an exception clause that would permit their development only under a special or conditional use permit. A ban could also be more indirect if the zoning code included a list of specific permitted uses that does not include use for a fast-food establishment.

If a municipality did not want to ban all fast-food establishments, but limit their prevalence, the zoning laws could allow for that, as well. Legislation could ban only formula restaurants, defined generally as a restaurant with the same menu or logo as some other restaurant in a different area, which would affect many of the franchised-fast-foods with which people are most familiar. Additionally, bans could be enacted for specific areas, such as on busy streets where they are most likely to attract customers. An area quota could be written into the zoning code, such that a maximum number of fast-food or formula restaurants could be in that area at any given time, limiting the number and accessibility of such restaurants. The density of these establishments can also be regulated, meaning that zoning codes would require them to be a certain distance apart. This approach could also be enacted as a stop-build for particular kinds of restaurants for a specific amount of time, meaning that particular types of restaurants may not be built in that area during a prescribed interval. Another version of this could also require that fast-food establishments be a certain distance away from other uses, such as supermarkets, schools, homes, or parks.

Precedents

There are communities that have used zoning regulations to exclude fast-food restaurants. However, until just recently, this has generally been on the grounds of aesthetics, economics (specifically tourism), and safety, generally from traffic and congestion (Davis, 2008; Mair et al., 2005a), and not on the grounds of public health. For example, Concord, Massachusetts; Carlsbad, California; and Newport, Rhode Island have all banned fast-food establishments in order to lessen congestion on the streets and enhance the aesthetic qualities of those communities. In places like Solvang, Calistoga, Davis, and Berkeley, California bans of certain fast-food restaurants are enforced in order to preserve the history of an area in support of the tourist industry and to limit the extent to which local business can be hurt by a market flooded with those types of businesses.

As previously mentioned, in 2008, a “fast-food ban” policy was passed in South Los Angeles, California, and was the first legislation of this kind to even mention public health as a

ENVIRONMENTAL DESIGN AND FAST FOOD CONSUMPTION

contributing factor in the development of such a policy. This ordinance prohibited the establishment of any new stand-alone fast-food restaurants in the area for a full year (Kurutz, 2008; Sturm & Cohen, 2009). The idea behind this policy was to freeze fast-food development in order to make room for other sit-down restaurants and supermarkets, which are sparse in the area, providing increased availability of more healthful options and less access to foods linked to increased overweight and obesity (Kurutz, 2008). While the final version of the policy still cites aesthetics as the major reason for the legislation, this was the first explicit attempt to approach the obesity epidemic through the zoning of fast-food (Sturm & Cohen, 2009); combining rationales of aesthetics and health promotion may be a promising alternative.

Obstacles to Effective Utilization of Zoning to Decrease Fast-Food Consumption

As previously discussed, there is evidence to suggest that a large-scale intervention aimed at decreasing obesity rates is warranted. Additionally, there are many indications that zoning regulations have the potential to have a significant effect on those rates. However, while the idea has merit, it is not ready for large-scale implementation for the following reasons.

A Lack of Empirical Support

First, there is not yet strong empirical evidence that this type of intervention will have the presumed effects on community members' behavior. In fact, although the majority of data suggest that the availability of fast-food has had a significant impact on obesity rate in the US, the scientific community is not in complete agreement about this (Jeffery et al, 2006; Newby, 2007; Rydell et al., 2008). While we know fast-food consumption is correlated with an increase in overweight and obese individuals and related health problems, experimental studies have not established a clear causal link between fast-food and overall rates of obesity. There is therefore no direct evidence that decreasing the availability of fast-food will have an effect on the prevalence of obesity in areas in which it occurs. Additionally, there are no data regarding the lengths to which people will go in any given community, with any given set of characteristics, to access fast-food. It is possible, although perhaps not likely, that removing fast-food establishments from an area will not deter consumption. Finally, while there are data that suggest access to supermarkets will improve diets, there have been no attempts to discern the best ways of bringing different, healthier options to a community from which fast-food has been restricted. Without such data, removal of fast-food may only eliminate choices without increasing the opportunity to make healthy choices.

Possible Legal Battles

Mair et al. (2005a) note that a zoning ordinance can be overturned if a court deems it "arbitrary, capricious, or not rationally related to a legitimate government purpose," (p. 8). J. Craig Sherman, a spokesman for the National Council of Chain Restaurants spoke out against zoning restrictions on fast-food, stating that, "the idea [is] an abuse of zoning laws," and that obesity is a problem of poor diet, nutrition, and personal responsibility, and is not the fault of fast-food restaurants, including the nearly 40 chains that he represents (Fernandez, 2006). It is this view, along with potential lost profits, that has contributed to many fast-food establishments

fighting this type of zoning in the past. In most cases, the courts have upheld the rights of the municipalities to zone out fast-food (Mair et al., 2005a; Mair et al., 2005b), but these zoning regulations have never been extended in the name of public health in this way before. It may be unlikely that the courts will side with the fast-food establishments, but it is possible, especially given the Commerce Clause, under which laws that are discriminatory in purpose or have a discriminatory effect on business may be overturned (Davis, 2008). Under this clause, if burdens on interstate commerce are greater than the local benefits, then there would be grounds for the zoning codes to be overthrown. Without any data on what the effects of limiting fast-food really are on both business and health, it is difficult to make a persuasive case in either direction.

Some of these conflicts may be avoided if large fast-food companies are brought on board with the movement to limit consumption of unhealthy foods, as opposed to fighting them head-on. Granted, these companies are in the business to make money, but it is possible that with the right incentives, such a partnership would be beneficial on both sides; supportive of a healthy food environment for communities and a public relations boon for companies. For example, Wal-Mart recently announced a plan with the support of First Lady Michelle Obama and her “Let’s Move!” program to improve the nutrition of their house brand products, decrease the price of fruits and vegetables, and press major food suppliers to follow suit (Stolberg, 2011).

Wal-Mart hopes to make up profit losses by increasing sales volume, a feasible outcome for a fast-food company, as well. By spreading out their stores and promoting healthy lifestyles through available menu choices, fast-food retailers could increase their customer base. Additionally, communities could incentivize such partnerships by opening up properties and new areas on the basis of menu choices and overall support of that community’s health; in other words, restaurants with the healthiest choices and the fewest locations in an area could be offered the most desirable commercial properties and ultimately increase their image and profits.

Public Opinion and Countercontrol

It has been demonstrated that government intervention can have a positive effect on the habits of individuals. For example, smoke-free legislation has had significant effects on adult smoking rates (Hahn et al., 2008; Wakefield et al., 2008). However, in spite of evidence suggesting it could be helpful, Mello, Rimm, and Studdert (2003) report that people are divided on whether or not they feel the government should have a say in the dietary habits of Americans. A public opinion poll conducted by Luke, Snell, Perry, and Associates on the subject reported that 48% of people feel as though obesity is a personal problem, while 47% feel that it is a public health issue that society needs to help solve (as cited in Mello et al., 2003). Those Americans that are against government involvement believe that obesity is a matter of personal choice and responsibility, and, to some extent, a measure of moral failure. Given that people enjoy fast-food, and that many people feel that government regulation on fast-food restaurants is at best misdirected and at worst an offense against the free market (Goston, 2007), enacting zoning regulations may set the occasion for the controlled community members to oppose government control with countercontrol (Skinner, 1974). In this case, individuals might go out of their way to consume just as much or more fast-food than before, just to show the controller that it cannot stop them. Additionally, some might attempt to get such zoning repealed on the basis that it is

ENVIRONMENTAL DESIGN AND FAST FOOD CONSUMPTION

not the will of the community at large, and absent data that support these interventions on large scales and long-term, there will be no persuasive counter-argument available.

Filling the Information Gaps – What We Can Do

An analysis is needed in order to design an intervention utilizing zoning as a tool that has a reasonable chance of working to decrease fast-food consumption among at-risk communities. It is crucial that data be collected that allow for understanding of the mechanisms behind any observed changes as well as refinement based on that understanding. Although the need for these data does not preclude any action, large-scale intervention should probably be deferred until the effects of such interventions are more fully understood and allow for more efficient manipulation of the environment—and until greater public consensus emerges.

Utilization of Convenient Pilots

While most places with restrictive zoning did not do so for health benefits, the results are functionally similar to what would occur if such codes were enacted under the umbrella of public health support. Behavior scientists would be remiss to overlook these sources of data when attempting to discern whether or not zoning regulation could decrease obesity rates. Initial analyses could compare the rates of obesity in areas where these regulations are in place with other towns in the US with similar demographics but not such regulations. Collected over time, these comparisons could be organized as an interrupted time-series across communities (Biglan, Ary, & Wagenaar, 2000), the findings of which could suggest whether and how much zoning out fast-food really impacts obesity in a given area. While it would be difficult to find enough similar communities from which to sample, even an analysis done with just a few could indicate relevant future directions.

If any significant differences are found, it would provide an opportunity to look at the components that may contribute to more effective zoning interventions. For example, if a town that does not allow drive-through windows has a lower rate of obesity than one that has an equitable number of fast-food establishments that do have drive-through windows, then zoning out drive-through windows may be an effective part of an environmental design intervention. In this way, components could be identified that may increase the likelihood of successful intervention when included in future attempts. To this end, Geographic Information Systems and/or other technology-based modeling may prove an effective tool for directing study areas. For example, building on the recent computer simulation work of Chen and Florax (2010) in identifying the effects on BMI of chain grocer introductions and incentives on economically disadvantaged communities to target policy implementation, it may also be possible to model the effects on BMI of proposed additional fast-food establishments.

Additionally, it would likely be useful to evaluate how far people will travel to eat at particular fast-food restaurants. To obtain an initial determination, fast-food establishments in and around the pilot areas could be visited randomly over a period of time and zip codes of patrons could be collected, as well as information on whether they traveled from their home specifically to eat at that restaurant or if they were passing by, traveling or running errands. From that, maps could be generated that portray the average distance people are intentionally willing to travel from their homes or workplaces to gain access to preferred items at fast-food restaurants,

taking into account those individuals who were simply on the move. Such data would provide an empirical basis for where fast-food establishments would be permitted to build and where zoning would restrict them. For example, if people tend to be willing to travel about 10 miles to consume fast-food, it may be wise to plan the environment so that there is only one fast-food establishment in any given 10-mile radius, so that it is available, but limited, within any given area.

Enhancing Community Buy-In

For an intervention to have the best chance of working in any given community, the researcher should attempt to collaborate with the people of that community in ways that will enhance cooperation and buy-in among those whose behavior the intervention is targeting (Fawcett, 1991). Randall, Swenson, and Henggeler (1999) used this approach to great effect on violence prevention within a neighborhood by designing the intervention with the community members, not for them.

In this case, that approach could be adapted in several ways. First, it would likely be helpful to discuss with several community groups, including young people, parents, area government, etc., what about the availability of food in their neighborhood they would like to change. A researcher might then ask where they tend to eat and why, how they feel about obesity, and whether or not they feel they have adequate access to healthy foods through the resources available in their area. Then, given the results from the impromptu pilots discussed previously, what the community wants should be approached using practices correlated with healthier communities that are likely to achieve both the community members' goals and the research goals.

Moreover, researchers should discuss with the community what they would like as a replacement for fast-food, and what aspects of fast-food are most important to them. This information would allow for incentive zoning to negotiate for things that the community really wants and needs, instead of only what officials think they should have. Additionally, knowing what the community finds useful about access to fast-food may allow for the development of performance zoning codes that require functionally equivalent services from healthier replacements. For example, if a low price on prepared food is designated as a desired time-saver for a particular community, codes could specify that supermarkets provide prepared meals, similar to that which a family could get at a fast-food restaurant, that meet certain nutrient guidelines and are sold for an equitable price. New establishments may also be required to have a weekly mailer with coupons to offset costs associated with purchasing healthier foods. It is important to make a focus of the work in this area bringing new, health-conscious establishments to areas in which fast-food is being restricted, because not doing so risks cutting a community off from food sources in general, which would likely be severely detrimental to community members' health and morale.

The success of the intervention may hinge on whether or not members of the community are likely to engage in countercontrol. Engaging them in the process and providing desired healthy alternatives is akin to designating a replacement behavior when putting a maladaptive behavior on extinction: everyone is happier and more compliant, and the intervention is more likely to have a desired effect quickly. A critical factor here will be providing healthy food that is also

ENVIRONMENTAL DESIGN AND FAST FOOD CONSUMPTION

highly reinforcing, since it is very likely that taste is a critical component. If alternatives are as, or nearly as, reinforcing as standard fast-food, that will likely increase choice of those items and reduce countercontrol. For example, recently airport concessions have answered a demand for “bolder tastes,” “fusion of flavors,” and “fresh and flavorful fare” by adding more gourmet restaurants serving high quality cheeses, grilled meats and vegetables, and salads (Ruiz, 2008).

Targeting the education of youth and changing the verbal behavior of communities with respect to fast-food may also help alter the stimulus functions of fast-food, and thereby limit the probability of such countercontrol. A similar approach has been used to decrease smoking rates, with considerable success for a several reasons. First, facts about smoking have been empirically validated and widely accepted. Second, the reason that these findings are accepted and understood is that they continue to be communicated to the public through social projects and media outlets (Biglan & Taylor, 2000). Biglan and Taylor point out that, “The motivation of population members to do something about a particular cultural practice is influenced by the verbal statements about the practice to which they have been exposed” (p. 271) and note that “the functions of a stimulus are affected by the way that sentences link the stimulus to other stimuli” (p. 272). Relating one’s own categorical or evaluative verbal responses to an event forms a relation between that event and those words, and through the process of derived relational responding, also forms relationships between that event and other events that are related in some way to those words (Hayes, Barnes-Holmes, & Roche, 2001).

This process can be utilized to equate reinforcing or punishing consequences with particular behaviors. Using the antismoking example, effective campaigns often relate negative words (smelly, unhealthy, dangerous, gross, death, illness, expensive, etc.) to cigarettes and the act of smoking using public service announcements, prominent warning labels, and news articles. Healthy diets that include little or no fast-food can be promoted similarly, by equating attractive, healthy bodies with a diet free of fast-food or alternately by establishing a relation between fat, unhealthy people prone to sickness and its consumption. Additionally, doing so with young children in schools may help kids avoid a long history of poor dietary habits, improve health in general, and support the movement to improve dietary options in communities by gaining allies in children and their families. Future work could investigate how and where such interventions would be most effective.

Admittedly, neither enacting zoning legislation nor collaborating with a community to designate replacement food sources and educate the population on health is likely to happen quickly. However, it is convenient that these processes can occur somewhat simultaneously, shortening overall time to implementation. It is true that some conclusions of the collaborative research would have to be analyzed prior to developing a large-scale intervention, but ongoing collaboration and the generation of partnerships with possible alternative food services would help fill the temporal gap between policy design and policy enactment.

Experimental Intervention with Control Communities

Given that the analysis of the cities with such zoning regulations may have indicated significant components of a successful intervention on fast-food consumption, the next step would be small-scale intervention. It would be useful to apply identified factors of success, one at a time, to several different areas, each with different demographic make-up, and each with an

equitable control community in which similar regulations are not being enacted. This analysis will allow for the identification of which components work well in which areas. Taking the previous example, it may be true that restricting drive-through windows in an area in which most residents have and regularly drive cars would be a deterrent for stopping and consuming fast-food. However, in an area in which most residents either do not have cars or choose to walk, the limited access to drive-through windows may have little to no impact on fast-food consumption.

This process, although time-consuming, has several positive outcomes. First, it allows for the identification of specific components that work in each area. It is relatively rare to identify an intervention component that is universally effective, so identifying the conditions under which each works is crucial to designing interventions that will size-up to larger scales (Biglan et al., 2000). However, if results indicate that there are universally effective components, an evidence-based kernel will have been identified, described by Embry and Biglan (2008) as “fundamental units of behavior influence” (p. 75) that “have a reliable effect on one or more specific behaviors” (p. 75) and are ineffective if any given piece is missing. These units, or kernels, can provide a foundation upon which to build consistently effective interventions. Finally, in the process of identifying these crucial components and critical conditions of application, pilot interventions will be occurring, meaning that any positive benefits of the intervention will change the behavior, and hopefully to some extent the health, of the community in which intervention is occurring.

A Promising Approach

The increasing rates of obesity in the US are of epidemic proportions, and obesity related illness is concurrently on the rise. The costs associated with this trend, both economically and physically, are substantial, and it is becoming increasingly important that effective interventions be developed to address these issues. Fast-food consumption, due to poor nutritional content, increasing portion size, and perceived affordability, are likely contributors to this public health crisis. Utilizing an already-established zoning process to place restrictions on fast-food establishments and limit consumption of unhealthy foods within a given community is a promising idea, but is not yet ready for wide-scale intervention. There is little research available to suggest that this idea would have any effect on eating behaviors, and if it did, there would be no way of knowing which components of any given intervention were the effective ones. Additionally, though it is agreed by scientists that this is a public health issue, the “public” has yet to have a say in identifying the needs of their community and designing an appropriate intervention. All of these criticisms could be addressed by analyzing available data, and applying it in an organized, controlled way, which should still result in positive changes in the smaller-scale test communities. In 2005, Nevin offered the advice, “Think globally, act locally.” If not hurried to possible failure, local action in the form of creative zoning for health could develop into a legitimately effective, large-scale intervention targeting obesity.

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LYDON, ROHMEIER, YI, MATTAINI, & WILLIAMS

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