

Obesity, Identity and Community: Leveraging Social Networks for Behavior Change in Public Health

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Obesity is a public health problem influenced by behavioral patterns that span an ecological spectrum of individual-level factors, social network factors and environmental factors. Both individual and environmental approaches necessarily include significant influences from social networks, but how and under what conditions social networks influence behavior change is often not clearly mapped out either in the obesity literature or in many intervention designs. In this paper, we provide an analysis of recent empirical work in obesity research that explicates social network influences on eating behaviors. We argue that a relational rather than individualistic view of personhood should help us better understand the content and context of social network relations that inform health behavior choices. We introduce the concept of ‘identity-constitutive affiliations’ as the glue that binds these social relationships together. Finally, we outline the implications for public health ethics in the development of effective interventions to address overweight and obesity, leveraging the content and context of social network ties to reinforce healthy (or alter unhealthy) eating. More complex treatment of positive and negative behaviors stemming from social network connections should lead to more comprehensive theoretical models of health behavior change and more effective public health interventions.

Introduction

Obesity is a public health problem influenced by risk factors and behavioral patterns that span an ecological spectrum of individual-level factors (e.g., diet, exercise), social network factors (e.g., family, friends) and environmental factors—including both the physical environment (e.g., schools, workplaces, neighborhoods) and the macro-societal environment (e.g., food marketing and availability, food pricing) (Story *et al.*, 2008). Public health interventions to decrease overweight and obesity are usually targeted at the individual and environmental levels. At the individual level, the focus of most interventions is usually on providing educational and motivational information to individuals to help bring about healthier eating and increased physical activity (Haire-Joshu *et al.*, 2008; Shai *et al.*, 2008), which unfortunately has yielded limited success in long-term weight loss (Hill *et al.*, 2008; Katan, 2009; Sacks *et al.*, 2009). At the environmental level, multiple interventions have been developed and tested, most targeting schools (Gittelsohn

and Kumar, 2007; Kropski *et al.*, 2008) and neighborhoods (Black and Macinko, 2008); again, most report only modest success at best (Kropski *et al.*, 2008).

Social network factors, although implicitly embedded in both individual level and environmental factors, are rarely explicated within the medical model embraced in the design of many public health weight loss programs. When social networks are targeted in the public health intervention literature, they are often treated as synonymous with positive social support interventions (Heaney and Israel, 2002), and are often embedded in a community-based empowerment framework (Wilson *et al.*, 2008). Intervention frameworks that target building capacity within communities and utilizing local members of the community (e.g., natural helpers), while potentially powerful in their own right, are nevertheless based upon a framework that is primarily individualistic, and assumes that people will (or at least should) choose healthy behaviors when presented with effective social support mechanisms and information to facilitate those behaviors (Holland, 2007: 127–130).

In our view, such approaches to behavior change in public health, and particularly in the area of obesity, are incomplete. There have been recent calls to increase the focus on community-wide approaches to interventions in obesity and overweight (Sacks *et al.*, 2009). Broader approaches to environmental interventions have been recommended targeting multiple segments of the obesogenic environment (including social networks) and utilizing community participatory approaches (US Department of Health and Human Services, 2001; Elinder and Jansson, 2008; Story *et al.*, 2008). Studies utilizing such approaches have shown promising results with children (Economos *et al.*, 2007; Foster *et al.*, 2008). However, these approaches fail to explicate *how* and *under what conditions* social networks leverage or constrain eating and activity patterns that promote weight loss. Recent work by Christakis and Fowler (2007) suggests that the role of social networks in reinforcing eating behavior patterns is perhaps larger than previously thought. There is a need for a more comprehensive conceptual understanding of how social networks work in relation to weight loss and behavior change in order to appreciate the scope of their influence and integrate their usage more explicitly as a powerful tool within effective and tailored interventions to decrease overweight and obesity.

In this paper, we argue first that many traditional approaches to obesity interventions are based on a narrow and individualistic view of autonomous personhood; as such they fail to take into account the complex systems of the social networks within which individual health behaviors develop and are sustained, as well as the content of these social network connections and the embedded contexts in which these relationships occur. We argue that it is critical to analyze the influence of social networks, not only structurally, but also through a deep understanding of the content and context of the relationships. Only in this way can we fully explain how social networks can act as complex and powerful vehicles of emotion, identity and agency that are capable not only of supporting positive behavior change but also constraining or limiting it.

Second, while it is an empirical question as to whether public health obesity interventions based upon narrow views of autonomy may be effective in some individual cases for particularly intractable problems (like obesity) where the causes are multi-factorial and densely interdependent, we hold that interventions in public health should nevertheless be based on a relational notion of personhood that more accurately reflects how people actually navigate (alone and together) the interplay between their environment and their identity construction in the attempt to improve their health behaviors.

Such a concept of personhood, we claim, will provide a richer base for building public health interventions with a greater chance of success, particularly in disadvantaged communities struggling with multiple constraints (e.g., socioeconomic deprivation, poor access to health information and health care, family instability, neighborhood violence). By incorporating a relational notion of personhood that is shaped by content and context of social connections, it is easier to identify and address both the positive and negative health behaviors that are supported (often for good reason) by the social connections, and apply this analysis to inform public health approaches in community settings.

A Framework for Analyzing the Role of Social Networks in Behavior Change

The importance of considering the role of social networks in our understanding of obesity has recently been underscored by two empirical studies—one, a large-scale quantitative investigation using social network analysis to explain patterns of obesity (Christakis and Fowler, 2007), and the second, a qualitative investigation looking closely at the social networks of low-income Latinos with obese children (Kaufman and Karpati, 2007). In our view, these two articles highlight an empirical reality that demands a broader conceptual approach to understanding how human beings engage in and attempt to transform patterns of health behaviors in their communities.

The literature in medical, legal and public health ethics has traditionally relied on varied but individualistic philosophical accounts of personhood and autonomy (see, for instance, Dworkin, 1976, 1981; Wikler, 1987; Childress *et al.*, 2002; O'Neill, 2003; Holland, 2007). A common thread in these and other treatments is the focus on resolving conflicts between the interests, plans or projects of the individual and the goals of health promotion programs, preserving individual autonomy while encouraging positive health behaviors. We can see an emergence, however, of relational accounts of personhood and autonomy (see MacKenzie and Stoljar, 2000; McLeod and Sherwin, 2000; Baylis *et al.*, 2008).

These relational views explicitly acknowledge both that 'each person's values are chosen in contexts that involve learning from and engagement with others . . . and [that] each must learn and practice the skills necessary for making responsible choices in social circumstances' (Baylis *et al.*, 2008: 202). Shifting to thinking of persons' autonomy in relational terms encompasses the complexity of the influence of human relationships on health in

a way that maintains respect for the values of solidarity and trust that are evident within interdependent groups (Baylis *et al.*, 2008). This approach acknowledges that health choices occur in an interdependent web of relationships that may require explicit learning and practice, and we would argue, a need for explicit constraints on negative behaviors. In this way, the relational approach goes beyond simply encouraging positive choices at the individual level.

But there is still, we argue, a component missing from these relational approaches when we consider health behavior change, which the recent empirical works on social networks and obesity explicate, and which we hold is necessary to analyze in order to develop a more effective public health practice in the area of obesity interventions. Christakis and Fowler (2007) demonstrate not only the strong influence of social ties on eating behaviors, but also point to the need for explicating the content of those ties in order to understand better how they function. For instance, they found that same-sex relationships exerted stronger influences than opposite sex ones— same-sex friends (even those living far away) were more influential than spouses or opposite-sex siblings. Kaufman and Karpati (2007) investigate the content of social ties, the social and economic context in which they occur and (crucially) both the negative and positive effects on individuals of the practices that are sanctioned by those ties.

These results suggest the need for expanding our basic notions of personhood and autonomy, to inform our analyses of public health obesity interventions. In this paper, we expand upon the concept of relational autonomy introduced by Baylis and colleagues (2008) by introducing a concept that not only links the individual with her relational reality, but also attempts to explicate the components of relational personhood that develop and reinforce particular health behaviors. We argue that in order to construct more effective and ethical approaches to health behavior change, it is crucial to recognize the relational affective features of human experience. Baylis and colleagues (2008) address this need through a shift in the account of autonomy, but her analysis does not explicate how these affective components actually manifest themselves in a more relational construction of identity and subsequent effects on health behavior choices.

We introduce here a unifying concept of ‘identity-constitutive affiliations’ as the glue that reinforces social relationships and the health behaviors practiced in these relationships, one that spans weak and strong network ties. In essence, identity-constitutive affiliations provide the relational content to the structure of a particular social network hence defining its unique characteristics.

We argue that the power of both weak and strong social network ties in reinforcing (positive or negative) health behavior lies in their ability to affirm some quality of affiliation that is tied to one’s identity—or how one views oneself. More specifically, identity-constitutive affiliation is an affective relation that takes as input a person’s values for others and the embedded contexts in which those valuations occur. It gives as output behavior change or reinforcement for a person, and (just as importantly) helps form, reinforce or shift that person’s sense of identity by means of the behaviors of those to whom she is affectively connected. As such, this more general notion takes into account affect, identity, community values and behavior across the social spectrum. It is broad enough to encompass both affective affiliations (e.g., strong ties such as familial or friendship connections) as well as affiliations that are grounded in common goals, interests or values (e.g., weak ties such as membership in political, religious or other community groups). Finally, it allows for the recognition of affiliations that are tied to economic and emotional survival as well as those which are traditionally targeted to enhance empowerment or social support. We argue that identity-constitutive affiliation serves both as an explanatory theoretical construct for understanding social components of health behavior and as a tool for identifying features of a social network that can be leveraged to promote behavior change.

We also explicate the implications for public health ethics of the strength of these affective ties for the development of effective interventions to address overweight and obesity, and illustrate the limitations of depending upon information or education alone to disrupt or encourage pathways of healthy/unhealthy eating. Leveraging the content and context of social network relationships requires a more nuanced understanding of how, when and to what extent they trigger individual behavior change. We suggest that by examining the power of identity-constitutive affiliation within social networks, this complex view can lead to more comprehensive theoretical models of the interdependent social structures that reinforce behavior patterns and ultimately inform more effective intervention programs in public health.

Social Networks in the Obesity Literature—A Complex Picture of Social Interdependence

Two recent empirical studies illustrate the power of a social network approach to understanding the problem of obesity. The first is a highly publicized study that looks at the spread of obesity using longitudinal data over 32 years

(Christakis and Fowler, 2007). It suggests that behavior patterns may be entrenched due to factors that operate somewhere between the individual and the environment. The authors apply a social network approach to show that the spread of obesity is due, in large part, to the influences of social networks of individuals connected not necessarily through geography but through affiliations based on personal identifications of close affective connection. The analysis shows that the likelihood of obesity increases based upon whether close friends (regardless of proximity) and some family members also become obese.

As has been established in family support research (Gass *et al.*, 2007; Falba and Sindelar, 2008), one's relationship with spouses and siblings has a strong mutual effect on behavior and health, and this relationship is confirmed by Christakis and Fowler in their analysis of the spread of obesity. Among siblings, a sister had a 67 per cent increased risk of becoming obese if her sister became obese, and a brother had a 44 per cent increased risk of becoming obese if his same-sex sibling became obese. Similarly, spouses had a 37 per cent increased risk of becoming obese in the event that the other became so.

Surprisingly, there was no increased risk of obesity for an individual if a neighbor became obese. These findings reinforce the mixed findings of many of the first wave of neighborhood and school interventions that have been implemented in the obesity field discussed above. The results clearly demonstrate that being in close physical proximity to someone who has become obese does not in and of itself appear to affect weight gain. More specifically, living in the same community with the same environmental constraints (like access to supermarkets, playgrounds, public transportation) does not necessarily translate into the same risk for obesity. Although environmental risk factors may be shared, Christakis and Fowler's work suggest that the social network connections between the individuals within these communities may be a more salient causal factor in the spread of obesity. Here we draw a contrast between the notion of geography and that of context. Where geography is defined by placement of physical structures, context is defined by the relationships, shared values and practices and the particular social networks of which individuals are members. Neighbors, for instance, may all be affected by geographic factors (like proximity of public transportation or grocery stores), but not all affected by contextual factors, as their practices, values and social connections may and do vary across income, ethnicity, religious affiliation, etc.

The researchers note that the effects of same-sex relationships are much stronger than those of opposite-sex ones; this would help account for the reduced effect

of a spouse's obesity. They speculate that it is possible that an individual's social norms are more strongly affected by the behaviors of same-sex connections because 'it is likely that people are influenced more by those they resemble than by those they do not' (Christakis and Fowler, 2007: 377). Although this study did not address the mechanisms by which social networks reinforce behavior norms, this finding suggests that subtle factors regarding identification with others who one believes are similar to oneself may influence behavior patterns.

One of the striking features of this study is that the authors show that even *asymmetric reported* close connections (reported connections by one individual that are not reciprocated by the person to whom this individual feels connected) have an effect on the likelihood that an individual will become obese, most likely corresponding to the notion of a weak social network tie. Among mutually identified pairs of friends where both individuals named the other as a close friend, the risk of obesity increased 171 per cent for one friend if the other became obese, suggesting that perhaps close ties more strongly reinforce health behavior. However, regardless of whether the friendship was mutual, an individual's risk of obesity still increased by 57 per cent if the identified friend became obese. Here, the authors illustrate that these social influences cannot be identified purely using an objective social network approach. It is not sufficient merely to point to a connection between two people without understanding the content of the connection.

Their study suggests that if one person feels a close connection to the other, this will influence her health behaviors, even if this affective component is not reciprocal. Christakis and Fowler discuss this phenomenon in terms of whether the individual 'esteems' another person, and thus mimics his/her behavior. The influence on behavior is neither purely environmental, nor purely individual, as the contextual factors are critical but interpretable only through examining in what ways they matter to the individual.

What is most important about these findings is that the value that an individual places on that social context is as important as the existence of that social context; the ways in which the individual prioritizes the elements of the social network are causally relevant and also only visible through an examination of the individual as situated member of a social network. Hence, understanding the content of these social network relationships, and the interplay between the values an individual places on the relationship and the context within which the relationship exists are vital to understanding how they influence and ultimately are explicitly incorporated into our approaches to public health behavior change.

Christakis and Fowler do not explicate the substantive nature of these social ties—they are simply identified via locator information in the individuals' research files and hence we do not know details about the content of these relationships. Whereas Christakis and Fowler emphasize the importance of the existence of these social networks in the spread of obesity, Kaufman and Karpati's qualitative research (Kaufman and Karpati, 2007) illuminates the embedded contextual nature of the mechanisms by which social networks function and reinforce either negative or positive health behaviors. This empirical work extends our understanding of the interplay between individual and context suggested by Christakis and Fowler, by explicating how apparently negative health behaviors may play a positive function for an individual's identity within the context of their lives.

Kaufman and Karpati use standard ethnographic techniques to study how socio-cultural practices embedded in the community of particular families influence the eating behaviors of the children in those families. Their methodology included multiple visits to conduct individual and group interviews, life histories and participant observation. The researchers found numerous food practices that contributed to childhood obesity in the interviewed families. These practices were embedded in a complex network of shared beliefs, important relationships, economic and other external constraints, as well as ethnic values and notions of parental identity. Through these practices, the individuals in the study have constructed identity-constitutive affiliations that both define them and also literally sustain them.

For example, in the participant interviews it became clear that overfeeding to produce overweight toddlers and children was central to some participants' notions of good parenting and body image for their children. An overweight body was considered normal and inevitable and influenced overfeeding patterns for children. Two main beliefs are involved: (i) it is important to give children what they want—gratification through (among other things) food is the job of parents; (ii) heavier children are aesthetically pleasing and healthier; thinner children are at risk for injury, illness and also less attractive. Overfeeding was seen as an expression of love or caring, and was a source of bonding across many relational groups, including mother-child, father-child, grandparent-mother-child and neighbor-neighbor. Attempts to curb practices like adding sweetener to milk, adding an extra meal to a child's diet, or sharing high-calorie treats with a visiting father were viewed by participants as a threat to important parent-child relationships.

What is clear from these examples is that eating norms about types of food served and eaten are strongly gov-

erned by close family and neighbor relationships. Even stronger, relationships are preserved and maintained through eating together. Identifying with another in a close family way requires eating the food they bring and that they eat. Here, we see evidence of identity-constitutive affiliation at work; whereas the food behaviors are certainly driven by strong emotional network ties, they are reinforced by very strong notions of values and affectional solidarity—feelings of belonging based on mutual care and concern (Baylis *et al*, 2008: 204). Simply being in the same family does not drive the strength of the network ties in relationship to eating behaviors. What reinforces their behavior patterns is tied intimately to values at the core of their identity, which are positive factors that nevertheless may reinforce negative health behaviors. Without attention to these factors, community-based interventions to change these behaviors may not be effective.

A crucial second component of how social networks reinforce eating patterns, however, is that many of these relational patterns were driven by food insecurity in this economically strained community. Food sharing was seen as necessary in the face of regular food shortage, and inhibited mothers' attempts to provide healthier food for children; when relatives brought fried chicken or ham and egg breakfast sandwiches for children, it was considered both rude to refuse such offers and also a necessary addition to the fluctuating food supply in the household. Many of the participants also engaged in what they called 'taking credit': buying foods at local bodegas on credit when their finances at the end of the month prohibited shopping at a supermarket. Despite the fact the families knew that the per-unit prices at bodegas were higher and the selection of foods tended to be less healthy (like fewer fruits and vegetables, and many high-fat or sugary processed foods), participants relied on them regularly, and the practice had been established for more than one generation, according to one participant. This reliance was possible because of social connections between the shoppers and bodega owners, an example of weak network ties that are nonetheless crucial to survival of the members of the community. This is also a prime example of conventional solidarity at work, based on shared traditions, interests, concerns and struggles of the community (Baylis *et al.*, 2008: 204). The social ties and conventional solidarity produced by those ties provide an identity-constitutive affiliation. And despite some of the negative behaviors they support, these connections should be leveraged rather than ignored or undermined through interventions that are developed within a framework of individual autonomy and based on information and education about healthy eating. Our social network approach

explicitly identifies these patterns and their importance for the functioning of the community. Furthermore, it suggests that the policy response may well include initiatives outside the traditional boundaries of public health.

Hence, identification with others in one's family and community is necessary for survival because of regular periods of food insecurity; with this identification come strong norms and restrictions (based on, for instance, relatives' access to available foods and the stocks in the bodegas) governing the types of food one can eat. Preserving the relationships in their networks cost the mothers a great deal of autonomy in determining food choices for their children, and they were well aware of this problem. Faced with such high-stakes decisions, mothers tended to act in ways they considered most risk-averse: preferring more food over less, tolerating a wider range of foods (including high-fat convenience foods) than they might otherwise prefer and, above all, acting so as to create some stability and safety in a generations-long tradition of regular cyclical food insecurity.

It is clear from this in-depth study that the embedded mechanisms that reinforce negative eating patterns for this community are affected not only by emotional connections but also by the very real need for survival during continued economic hardship. Changing such behavior patterns requires navigating these constraints in ways that can explicitly address the pathways of flexibility within the network and work toward designing interventions that target not just a physically located community, but a social network of vital connections that matter to the individuals who belong to it. The goal for such an intervention would be to provide members of that social network with behavior change options that respected their important relationships and did not put at risk their community-based food safety net.

It is critical to acknowledge that 'we are not all equally situated with respect to the opportunities we encounter to develop our autonomy skills and pursue our preferences' (Baylis *et al.*, 2008: 202). If we accept that members of disadvantaged communities are operating within a framework of relational autonomy, whose well-being depends on maintaining both affectional and conventional solidarity, then we see how respect and acknowledgement of identity-constitutive affiliations are critical to our understanding of intervention development; this may reframe the goals of any public health intervention and require a more complex understanding of what is healthy or unhealthy eating behavior and the implications for policy outside a narrow public health framework. If, on the other hand, the intervention is framed through the lens of traditional personhood and autonomy, then we ig-

nore (at our peril) the context-specific investigation that is directed by the values and affective experiences of the members of the community, and risk identifying outcomes that are endorsed by the medical establishment but that may be extremely difficult to implement within the realities of the community context. Kaufman and Karpati (2007) clearly illustrate how some of the eating practices that outsiders would consider unhealthy (like food sharing or extra meals for children) serve important family bonding functions; any childhood obesity intervention will have to incorporate the needs and values of the community as the members frame them in order to have a chance at effectiveness.

A Proposed Model

As we have seen in these two studies, a shift to relational autonomy allows us to acknowledge the interdependence among persons. We argue that incorporating the concept of identity-constitutive affiliation provides a way to connect that interdependence to identity and behavior.

We can use features of the affective connections in social networks to understand better how they affect individual behaviors in general—below is our proposed four-part framework.

First, the social connection needs to matter (that is, satisfy some affective criteria of importance). These criteria may be tacit, and individuals may not be consciously aware of them. For instance, in addition to familial or friendship ties, individuals may make connections via membership in shared interest groups (like school, religious organization, sports team) or through various community affiliations. The key feature that sets this apart from standard public-health models is the affective component—merely sharing the same geographic conditions (like living in the same neighborhood) do not thereby create social network connections; persons have to identify with others and value them. Another important feature is that the connection has to be an identity-constitutive affiliation; that is, the person making the connection to another has to see herself as like the other in a way that is important to her sense of self.

Affiliations can be identity-constitutive in complex interrelated ways. The connections important to a person will in some cases be unreciprocated, as we saw in one of the studies above. Nonetheless, these connections are important for understanding the links between identity and motivations for behavior. For instance, a student may identify with a teacher in an academic context, thus forming views about how she sees herself as an intellectual or a future scholar. The fact that the teacher does not engage

in reciprocal identification is a normal function of the teacher's role. Christakis and Fowler's study further suggests that in non-hierarchical relationships, asymmetric influences also obtain, suggesting that people make a variety of context-dependent identity-constitutive affiliations. Emotional connections within a person's social network appear to have powerful roles in embedding identity; this fact helps explain why it is critical to take them into account when attempting to promote behavior change, and possibly utilizing their power in the context of a social network intervention.

Second, at the contextual level, the connection needs to matter within a certain arena or setting. Identity-constitutive connections are almost always relative to a context. For instance, a student may identify with a teacher in her capacity as intellectual role model, but not identify with the teacher's athletic interests. In order to understand causes of complex phenomena like obesity, it is important to identify in which contexts social network influences of others are salient for individuals. For instance, tacit norms about permissible snacking behaviors that hold sway over an individual at a party with friends may fail to have any force in the workplace even if some of the same friends and food triggers are present. It is important to identify both the nature of connections and context in which connections hold.

Third, at the mechanism level, the connection needs to influence the behaviors of the persons in these networks. Given an identity-constitutive affiliation in a particular context, we need to know what sorts of behaviors are triggered by the connection. For instance, when a relative brings food after a meal has been recently eaten, it is important to know whether that triggers eating in effect an additional meal. In the student-teacher case, an identity-constitutive connection may trigger increased study time and improved grades. Exactly which behaviors are triggered may vary among individuals, although investigation has revealed some generic types of behavioral responses to particular triggers. For instance, in research done on contextual cues for eating behaviors, it turns out that in group-eating contexts, average calories consumed per person increases as group size increases (Bell and Pliner, 2003; Herman *et al.*, 2003). Identifying typical responses of individuals who are members of the same social network may prove useful, especially when designing interventions tailored for their community.

Fourth, the connection needs to yield an identity-constitutive outcome; in part through the behaviors triggered by the connection, the individual gets to experience or view herself as like those with whom she is connected. In the student-teacher case above, the student may engage in behaviors (studying more, applying to college)

through her identification with the teacher. Actively participating in these behaviors then enables her to see herself as a future teacher herself, an intellectual, or a future college graduate. Furthermore, seeing herself this way is crucial to her sense of self. Connections may impede behavior change as well. An obese individual, through connections with obese family members, may see her own body size normalized, and thus experience herself as not overweight. In part because she does not see herself as overweight, she does not change her eating patterns that are maintaining her obesity.

Some Illustrations

In the section below we provide some applications to illustrate how the four-part framework operates.

An overweight/borderline obese working-class college student works part-time at a fast-food restaurant. Such jobs are plentiful, and other employment, especially part-time, is hard to find. The student can also carpool with other students working there, reducing transportation costs. He identifies strongly with the other employees, most of whom are also students who work and take classes. He enjoys the camaraderie of the group; they joke together and also talk about struggling to balance work, school, social life and family obligations.

Each employee is entitled to a free fast-food meal for each shift worked. Despite the student's weight and health concerns, he eats a fast-food meal at work at least four times a week, and also stops by for free meals (given to him by fellow employees) at least twice a week. He sometimes comments on how the fast-food meals are unhealthy; in fact it is a running joke among the employees. However, none of them ever brings food from home to eat during shifts, and there is a tacit convention that employees' meal portions will be large (like large fries rather than small fries). The student has recently gained weight, which worries him. However, he cannot afford to quit his job, and he enjoys the connections with the other employees—in fact, because of time constraints, it serves as a surrogate for social activities with his other friends.

In this case, the student has identity-constitutive affiliations with the other employees. His social network is also constrained by economic need. Work provides relief of that need both through wages and meals. Weak social ties to the other employees allow him to see himself as like them—young people struggling to better themselves through education while combating the problems of the real world, producing a sense of conventional solidarity among his fellow student workers. His eating patterns conform both to the constraints of his situation and the norms set by the group of employees. In return for

engaging in conformist eating behaviors, he gets to see himself as like them and enjoys the benefits that those ties create. However, part of that identity is being an obese person. In this case, the student's eating behavior cannot be divorced from his sense of self or from the social context within which it acquires meaning; further, it is highly doubtful that an obesity intervention targeting the student that does not alter the content and context of his affiliations at the fast food restaurant (say, by implementing structural and social changes affecting employee working conditions, or by providing job opportunities for students outside of fast food) would work.

We now turn to a positive case in which identity-constitutive affiliations within a newly created social network help bring about healthier eating and activity behaviors.

An overweight sedentary woman living in a suburban area wants to be more active. She remembers enjoying bike riding as a kid—it was her most pleasurable exercise. She buys a bicycle at her local bike shop; they suggest a 'comfort bike'—a hybrid designed for people who do not ride long distances but want to be more active. This has both positive and negative effects (unbeknownst to her). On the one hand, hybrids are easier to handle and more comfortable to ride for people who are less fit, making cycling more accessible. However, riding a hybrid marks one as not a 'serious' cyclist in the eyes of the cycling community, and in fact bars one from joining organized bike club group rides—hybrids and people who ride them are considered too slow for the minimum speeds common on organized rides.

Cut off from the education, support and personal connections of a biking group, she finds riding alone hard. She gets discouraged that climbing hills makes her out of breath—but gradually she increases her stamina and is riding 5–10 miles at a time. Over the course of a few months, she loses a modest amount of weight—increasing exercise and body awareness help her pay more attention to what she is eating as well.

Once she feels like she is in a better shape, she starts to look for a group to ride with. Despite the fact that she is well informed and motivated, she wants the structure of a group, along with a sense of solidarity, created through the emotional connections of shared interests, norms and goals. However, her community bike club is not an option for her, in part because she does not identify with that group—they are too fast, mostly male and have different cycling interests and goals. At this point, she does not have a ready-made group to join. She fears that without the emotional support and connection to a group of people with shared interests, she will stop cycling and regain the weight she has lost.

In response to her needs and the lack of organized groups, she contacts friends and neighbors and starts organizing casual rides first in her neighborhood, and then for longer distances. Over time, the group becomes more organized, fit and enthusiastic. As the group becomes larger, they plan rides using subgroups of different fitness levels, speeds and distances. Two priorities rule: (i) they make sure that every rider in every subgroup is comfortable, and no one is 'dropped' (left behind by the other riders); (ii) they emphasize group cohesion, noting the upward mobility of riders through the ranks of the speed groups and the shared identity of all as women cyclists, regardless of speed level. Although weight loss is not an explicit goal of the group, many members report modest losses, and as their activity levels increase, they find themselves eating more nutritious foods, sleeping better and feeling an overall sense of greater wellness.

A news story in the local paper on the group prompts other women's groups to contact them for advice on how to start their own 'soccer moms on two wheels' bike clubs. The women, both in the club and in other groups, identify with each other as aspiring cyclists, but do not see themselves as conforming to the (largely male) cyclist standard. For them, developing a network of personal relationships in this context brings about a set of norms and expectations that provide positive limitations on their eating and activity behaviors, as well as a sense of identity as women cyclists.

Here, the individuals involved often lose weight and begin to develop better eating habits. We see the notion of relational personhood reinforcing the development of behavioral change, with the interplay between the individual and their affiliations. The impetus for these changes is reinforced by the fact that the identity-constitutive affiliations of those involved are reinforced through the other group members, that these relationships matter, and that through developing these social networks the behavior changes yield an identity-constitutive outcome as a healthier, active person.

Conclusion: Implications for Public Health Interventions

In this paper, we have argued that behavioral interventions for obesity, even those targeting social network connections, are missing two important features: the affective content of those connections, and the contexts in which they occur. We have examined two recent studies in which social networks exert strong influences on individual eating behaviors. Christakis and Fowler

(2007) point to the existence and power of affective connections as measured by social, rather than geographic distance. Kaufman and Karpati (2007) provide a close examination of the content of those connections and the emotional as well as economic needs that those connections satisfy for the members of that social network. We can see both from recent empirical work and our subsequent analysis and case descriptions that a relational account of personhood is necessary to examine adequately the content of social network connections as well as the context in which those connections are embedded. This approach is crucial to understanding both how they function and how interventions should be tailored to the values, needs and constraints of those within those contexts.

As a result of our analysis, we have identified and named a feature of social network structures that helps explain patterns both of behavior entrenchment and change: identity-constitutive affiliation. It serves as a way to understand the links between strong and weak social ties that define relational autonomy and changes in identity and behavior based on those social ties.

Using identity-constitutive affiliation in a public health assessment or intervention has ethical implications for public health theory and practice in the following ways:

- (1) It respects persons in that it recognizes the relational nature of autonomy and personhood and the constraints of persons within those communities;
- (2) It avoids paternalism by harnessing the content of the relations as they exist within a particular embedded social context to inform and direct interventions that are likely both to be more effective in promoting behavior change and more in line with the values, plans and goals of the members of that social network;
- (3) It empowers members of the community to use the power of their strong and weak social ties, which already provide many positive effects for them, to choose pathways to health promotion specifically tailored to their needs, constraints and values;
- (4) It may point to solutions or plans that are outside the purview of public health (e.g., economic, legal, other sorts of policies). However, this merely underscores how rich and complex the content of our social relations and ties are—they cut across multiple spheres of life.

Our analysis implies that public health interventionists should consider models for behavior change that exploit the embedded nature of social networks and which reinforce positive identity-constitutive affiliations. We have

presented two cases—one of the role of social networks in sanctioning and explaining negative health behavior and one in which a new social network was created to bring about a desired behavior change, and through it, a new sort of potential identity. In both cases, the social network provides a positive shared self-image for individuals in the network. It is not sufficient just to focus on interventions that tempt individuals with the possibility of new positive self-images through positive health behaviors; it is also important to get inside social networks that underwrite negative health behaviors, and see if there is some way to adjust the structures constraining the networks in a way that preserves or even feeds that positive self-image, but also hooks up to positive (rather than negative) health behaviors.

Another important component of our analysis is that it renders unnecessary the awkward and pejorative category of ‘lifestyle choices’. Often, the poor and generally disenfranchised are blamed for bad health on the grounds that they make poor choices in eating, smoking or other risky behaviors. By recognizing how social networks function—especially when they are embedded in economically constrained environments—one can locate more mutable features of the network, and design interventions to take advantage of the areas of flexibility of the network. Behaviors that are situated in relationships upon which individuals depend for survival may require socio-contextual interventions that address economic deprivation in general (like improvements in access to economic resources, links with social service agencies who can facilitate meeting economic needs), to supplement interventions that target the strictly physical/medical components of health behavior change.

By expanding upon a notion of relational personhood to include the content and context of identity-constitutive affiliations that actually reinforce particular health behaviors, public health practitioners should more adequately address the problem of obesity at multiple levels and design more effective interventions in this area of public health.

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