Means and Meanings

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For years, design has improved efficiency, reducing the efforts of daily living by decreasing the intensity, frequency, and duration of gross movement. Work is located near restaurants and parking near work. Elevators reduce the requirement of lifting one's body weight up a flight of stairs to the minimal effort required to push the elevator button and step inside. Workstations are designed to put everything at hand, reducing the frequency of trips back and forth between separate areas to retrieve needed materials, and inter-office phones and e-mail have reduced trips required to communicate with co-workers. When movement is required, it is of short duration—the short walk in from the parking lot, the quick jaunt down the hall. So efficient!

In fact, design has maximized efficiency so much that work can continue with low physical effort for hours and hours at a time. It is no wonder, then, that over half of workman's compensation claims are now attributed to repetitive stress injuries, the result of hours and hours of unrelieved, low-intensity work. It is no wonder that timers and reminder software are now needed to encourage breaks, as they no longer occur naturally.

We have become so efficient in reducing physical activity that over one-half of adults in developed countries are now overweight or obese, and that number is growing. Active living has declined to the point that fewer than twenty percent of Americans are active enough to improve or even maintain their health and fitness. The other eighty percent are in various stages of decline (2).

Recognizing the usefulness of movement in reversing the obesity epidemic, designing for active living has become a modern mission. But how is movement to be added to settings that no longer require it? Decreasing efficiency in time-sensitive lives can force movement, but it is liable to anger the users, and the efficiency-minded will invent short cuts to circumvent unwanted steps.

Another option is to make movement an attractive choice in the built environment, and this strategy is supported by the observation that lifestyle activity can be as effective as structured exercise in achieving both weight loss and physical fitness. Initiatives such as America On The Move, Project Active, Active Parks, Planning and Designing the Physical Active Community, the Pedestrian and Cyclists Equity Act, and Active Living By Design encourage design for active living in which attractive settings for movement, usually walkways, are integrated within the overall design of buildings and communities (5).

A common goal of design projects for active living is to increase the number of steps taken to 2,000 per day. With so many current projects, so many communities, undertaking this challenge, wouldn't it be a shame if they fell short, not by failing to achieve their design goals, but by following design goals that will not result in active living?

The health and fitness benefits gained from movement depend upon the movement's intensity, duration, and frequency. If designs succeed in adding 2,000 steps to each person's daily energy expenditure, what will be the result? Two thousand steps, approximately one mile of walking, equate to about 100 kcal of energy expended, depending upon the weight of the person walking. It is estimated that the current obesity epidemic results from a daily imbalance of intake and output on the order of 100 kcal. Increasing output by 2,000 steps a day would seemingly halt the epidemic's progress.

But it would not reverse it. Fifty-five to sixty percent of the United States population is estimated to be overweight, and over twenty percent are reported to be obese. To reduce their already accumulated fat, the American College of Sports Medicine recommends that individuals increase their activity levels by 300 kcal per day. That's the equivalent of three miles of walking, or 6,000 steps per day, three times the goal of current projects for active living (2).

On the performance continuum, reducing obesity returns to individuals the opportunity to move through an entire range of motion without being stopped by fat mass and to transport the body without undue fatigue from the strength and energy required to move a heavier mass. Reducing obesity also reduces the risk of injury and chronic disease that can further undermine functional living. However, to really impact the incidence of chronic disease, more may be required.

There is a consistent, inverse and linear relationship between the volume of physical activity (intensity x duration x frequency) and both incidence and mortality rates from cardiovascular and coronary heart disease. More movement means less disease. Within this general picture, it appears that there are threshold requirements for affecting separate parameters such as cholesterol profiles and resting blood pressure (4). A similar volume relationship exists for regulation of parameters associated with the onset of type II diabetes, such as insulin sensitivity, glucose tolerance, and triglyceride profiles (1).

The issues of intensity, duration and frequency become more important if we decide that we not only want to be functional, to avoid impediments to daily living, but also, that we want "active living" to mean being able to take on challenges and to live energetically, perhaps vigorously. The principal of overload is inescapable in exercise physiology. To cause adaptation in strength, aerobic capacity, or flexibility, movement must be performed with higher forces, for longer

durations, requiring greater ranges of motion. Furthermore, physiology is not static. It is either responding to a stimulus to improve, or it is declining.

To achieve environments that allow active living at the fit level, opportunities must exist for exertion of graded levels of force, for sustained rather than intermittent activity, and for movements that tax the reach of arms, legs, and torsos, the very elements reduced so conscientiously in the pursuit of efficiency. Just to make the design task more challenging, all of these need to be adaptable to different statures and states of individual fitness, and they must be used on a regular, long-term basis. Designs for active living that support fitness attainment might modify simple parks and walking trails to include spaces to safely climb, jump, swing, leap, run, cycle and bend, but how do you get people to elect activity that is inherently outside their comfort zones?

Whether the goal is to increase walking by 2,000 or 6,000 steps per day, or to provide a wide variety of movement options to allow development and maintenance of physical fitness, movement is the means to achieve the goal. However, for the individual, movement is not only a means; it also has meaning.

While it is possible for the outcomes of movement to be meaningful, as in decreased fat, reduced disease, and increased fitness, the effectiveness of instrumental motivations over time is low. New parks, walkways, and other active spaces enjoy a brief honeymoon of activity and then either sit vacant or accommodate only small cohorts of habitual exercisers. When design includes, as it must, a choice of whether to participate, the inducements need to be persuasive and long lasting.

“Designing With Spirit” in designs for active living suggests tuning in to the meanings which movement can have for individuals and providing opportunities for those to be experienced within the designed space. For example, movement can be an opportunity for challenge, for competition, for accomplishment, for socializing, for solitude, for feeling part of nature, for glorying in physical sensation, or for centering oneself in the universe. When these meanings are honored, movement ceases to be only a means to an end and becomes an opportunity to add quality to the lives that will move through and interact with the space.

Three elements are particularly effective in encouraging the choice to be active. These are control, curiosity, and challenge. Preserving choice of mode, path, and effort allows intrinsic motivations to drive participation, and it is intrinsic motivation which best predicts voluntary activity participation. Environments that inspire curiosity yield movement through exploration, which appeals to intuitive temperaments, and environments posing challenges appeal to the sensing, achievement-minded.

Notice how the assessment of a design changes with its view of movement. When movement is valued as a means to an end, the criteria are numbers of steps taken and parameters related to movement volume—intensity, frequency and duration. When movement is valued for its meanings, the questions are, "Do they love it? Is it fun?" To be effective in encouraging active living, both the means and the meanings of movement will need to be part of the design.

Not long ago, in an historical sense, the requirements of the day quite naturally resulted in active living. Old Order Amish women and men living in similar ways today still accumulate a daily average of 14,000 -18,000 steps (3). Modern living has reduced our labors to the point that we now miss them. In achieving the mission of active living through the design of built environments, we can manipulate people to move, but we will succeed better if we inspire them.

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