



The meta-volition model: Organizational leadership is the key ingredient in getting society moving, literally!

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ABSTRACT

This paper argues that substantive and sustainable population-wide improvements in physical activity can be achieved only through the large scale adoption and implementation of policies and practices that make being active the default choice and remaining inactive difficult. Meta-volition refers to the volition and collective agency of early adopter leaders who implement such changes in their own organizations to drive productivity and health improvements. Leaders, themselves, are motivated by strong incentives to accomplish their organizational missions. The meta-volition model (MVM) specifies a cascade of changes that may be sparked by structural integration of brief activity bouts into organizational routine across sectors and types of organizations. MVM builds upon inter-disciplinary social ecological change models and frameworks such as diffusion of innovations, social learning and social marketing. MVM is dynamic rather than static, integrating biological influences with psychological factors, and socio-cultural influences with organizational processes. The model proposes six levels of dissemination triggered by organizational marketing to early adopter leaders carried out by “sparkplugs,” boisterous leaders in population physical activity promotion: initiating (leader–leader), catalyzing (organizational–individual), viral marketing (individual–organizational), accelerating (organizational–organizational), anchoring (organizational–community) and institutionalizing (community–individual). MVM embodies public–private partnership principles, a collective investment in the high cost of achieving and maintaining active lifestyles.

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Introduction

“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.” – Margaret Mead

Meta-volition refers to the collective agency or volition of early adopter leaders motivated by rising health care costs, an aging workforce, budgetary constraints, escalating demands for service, or global competition to implement practice and policy changes in their own organizations to improve health and productivity. In particular, societal investment is needed to surmount individual-level deterrents to sustainable physical activity participation, in the context of the post-modern sedentariness-promoting environment (Swinburn et al., 1999).

The meta-volition construct

The neologism meta-volition refers to the impetus to change individual behavior arising, not from conscious intention by the individual, but rather from leaders or decision makers concerned about organiza-

tional performance or the public good. Meta-volition may address the limitations of individual agency, given the multitude and robustness of factors external to the control of the individual (Cohen and Swift, 1999; Day, 2006; Yancey et al., 2006; Young et al., 2002): seductive commercial marketing of readily accessible and appealing sedentary alternatives, an evolutionarily driven preference for inactivity and the immediate gratification of engaging in inactive pursuits (e.g., the stimulation, enthrancement or social engagement of sedentary entertainment and the convenience and status associated with private transportation). Moreover, there is no immediate equivalent to hunger or thirst as a physiological prompt to exercise, nor are consequences of inactivity as immediate, robust or striking as anorexia. A survival advantage of starvation protection may be conferred by this human inertia, comparable to that conferred by the innate human propensity to overeat energy-dense foods (Bellisari, 2008; Eaton et al., 2009).

The meta-volition model

The meta-volition model (MVM) specifies a cascade of changes that may be sparked by the structural integration of brief bouts of physical activity into organizational routine as a common thread or catalyst that may be implemented across sectors and settings. The

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model outlines pathways to achieve higher-level or upstream population change, indicating directional, temporal and sequential interactions between levels. The model builds upon inter-disciplinary behavior change models or frameworks that similarly address multiple levels and societal sectors (Bandura, 2004; Booth et al., 2001; Cohen and Swift, 1999; Dearing et al., 2006; King and Sallis, 2009; Sallis et al., 2006; Stokols et al., 2003). To these models, the MVM adds (1) a dynamic and sequential, vs. static and hierarchical conceptualization of change; (2) an integration of biological influences with psychological factors at the individual level, and sociocultural influences with organizational processes at the community level; and (3) an integral cultural sensibility and adaptability.

The model may capture key features necessary for population-level physical activity engagement, including cultural resonance, accounting for human nature (Eaton et al., 2009; Halpern et al., 2007; Thaler and Sunstein, 2008; Zimmerman, 2009), benefits across multiple domains (Maibach et al., 2009), delivery of substantial returns on investment (Pronk and Kottke, 2009) and utilization of information technology (Yancey, In Press; Yancey et al., 2006a,b,c; Yancey et al., 2005) (Table 1). This may stimulate multi-purpose advocacy, and foster multi-sector participation, particularly public-private partnership.

Public-private partnership deserves special emphasis. Usually this amounts to public health entities receiving money from private corporations and doing with the money as they see fit. However, a more appropriate model from a growth and sustainability standpoint would further the aims of both (Simon and Fielding, 2006; Steckler and Goodman, 1989; Yancey, In Press). For example, public health foundation support helped the physical gaming industry gain traction, as reflected in the 600,000 Nintendo Wii units sold within days of their release in December 2005 (Yancey, In Press).

While environmental wellness interventions that compel healthier choices may be more effective (Galinsky et al., 2007; Seymour et al., 2004), very few have included physical activity. Since most Americans are overweight or obese and relatively sedentary-unaccustomed to moving, (2005; Troiano et al., 2008; Yancey et al., 2004a) “push” or “opt-out” strategies that make the active choice the default choice and the inactive choice difficult may be a critical interim step toward increasing physical activity populationwide. This approach is consistent with the finding that larger effects are produced by interventions that involve monitored activity doses (Physical Activity Guidelines Advisory Committee, 2008).

Table 1
Key features of MVM necessary for population-level physical activity engagement.

| |
|---|
| Accommodates the behavioral economics of physical activity (lack of innate drive) in addressing the individual's resistance to exertion and the strength of the competition (pervasive and seductive advertising, and appealing and readily accessible sedentary options) (Maibach, 2003) |
| Resonates culturally for the sedentary majority, e.g., women, less affluent people, ethnic minority groups (e.g., Young et al., 2002), overweight/obese individuals |
| Exploits the powerful desire for social approval in influencing behavior, inviting peer pressure, social comparisons and inspirational and aspirational role modeling |
| Delivers a “return on investment” for the decision makers investing in the intervention, aligning their self-interest with the changes promoted |
| Capitalizes on advances in information technology, including multiple mass communication vehicles to influence the social environment, e.g., the viral marketing integral to 2008 Presidential campaign fundraising |
| Inspires and mobilizes advocacy across social justice constituencies or public health content areas, e.g., environmental protection and conservation, environmental justice, injury and violence prevention, active commuting and leisure |
| Permits multi-sector participation incrementally, beginning with “putting our own house in order” such that nearly everyone has immediate opportunities to initiate action with trialability—minimal upfront investment, limited commitment and ease of adoption |
| Presents opportunities for public-private partnership, in which the public sector identifies the need, develops effective approaches and highlights the commercial potential, “out-sourcing” dissemination to the private sector, more capable and capacious in this task |

Table 2
Recess as an ideal feasible, scalable, population physical activity promotion model.

| |
|---|
| Institutionalized—part of the structure of the organization occurring with regularity once or twice each day, with an ingrained prompt, the recess bell! |
| Ubiquitous—done everywhere, by everybody, in any attire, crossing gender, racial/ethnic, SES, regional, religious, and residential lines |
| Familiarity and distinction—makes social marketing easier because people automatically “get it” in a single word that's unique in this regard—activities, fun, and time out or escape from duty. |
| Compulsory—interruption of duties or lessons is mandatory, but active participation is not (mitigates feelings of coercion)—“you can lead a horse to water, but you can't make him swim.” |
| Social event involving social support, peer modeling and peer pressure |
| Connotes fun and enjoyment, placing physical exertion in a positive and appealing light—eagerly anticipated and awaited, not dreaded as an obligation—play not work! |
| Culturally congruent and adapted—similar and different activities appropriate to urban, suburban, rural, and various regional settings, e.g., Kansas, Kentucky and Ka'uai, and often targeted to age and gender |
| Facilities and space provided—dedicated for this purpose as a part of school siting, indoors and outdoors, convenient and accessible |
| Activities and skills carry-over or spill-over to other venues—self-efficacy may be transferable to other settings and even between sports or activity types |

In addition, as time spent away from home in structured settings increases, so does the importance of integrating physical activity into organizational routine (Bleich, 2008; Sturm, 2005), e.g., in schools and workplaces. Why might recess breaks, in particular, represent an ideal model for a readily disseminable, scalable, inexpensive, population-based physical activity promotion approach in an increasingly diverse society? Recess is social, institutionalized, compulsory, ubiquitous, familiar yet distinctive, culturally adaptable and widely regarded as enjoyable. Facilities and space are available, because it can be done anytime, anywhere and in any attire. Activities and skills may carry over to other venues or life arenas (Table 2) (Donnelly et al., 2009; Yancey et al., 2006a).

Evidence base for brief, structurally integrated activity bouts

Many opt-out strategies for structurally integrating short bouts of continuous activity into daily organizational routine have been used. Some are fairly generic, including restricting nearby parking and elevator use, modeling stair use by leaders in moving between work activities, hosting walking meetings and establishing auto-free perimeters around schools and workplaces for student or employee drop-off and in shopping and business districts (Levine and Miller, 2007; Nicoll and Zimring, 2009; Zernike, 2003). Others are more culturally grounded, such as incorporating short activity breaks to music into the school or work day (Donnelly et al., 2009; Jurg et al., 2006; Lara et al., 2008; Liu et al., 2008; Yancey, In Press, Yancey et al., 2004b,c). Of these strategies, only inserting short bouts of group exercise into work or school day routine has a substantive body of empirical evidence.

Some 25–30 demonstration projects, university or corporate research studies and local or state government health and human services programs support the feasibility, efficacy and effectiveness of the concept of incorporating brief (usually 10 min) structured group exercise breaks into daily organizational routine, as a major intervention component or as a singular approach. About half are rigorously designed randomized controlled trials (Cardon et al., 2004; Crawford et al., 2004; Donnelly et al., 2009; Ernst and Pangrazi, 1999; Jurg et al., 2006; Liu et al., 2008; MacKelvie et al., 2003; Mahar et al., 2006; Naylor et al., 2008; Pangrazi et al., 2003; Pohjonen and Ranta, 2001; Pronk et al., 1995; Yancey, 2009; Yancey et al., 2004b).

- There is considerable receptivity to physical activity integration into the conduct of “business,” both at the individual and organizational levels (DuBose et al., 2008; Lara et al., 2008; Lloyd et al.,

- 2005; Lobstein, 2006; Pronk et al., 1995; Tsai et al., 2009; Wilcox et al., 2007; Yancey et al., 2004a,b; Zahner and Block, 2006).
- Breaks may contribute meaningfully to daily accumulation of moderate-to-vigorous physical activity (Andreyeva and Sturm, 2006; Cardon et al., 2004; Ernst and Pangrazi, 1999; Mahar et al., 2006; Malina and Little, 2008; Naylor et al., 2008; Stewart et al., 2004; Williams et al., 2009).
 - Breaks may serve as motivational “teachable moments” linking physical inactivity to sub-optimal health/fitness status for sedentary individuals (Yancey et al., 2004b).
 - Improvements in clinical outcomes have resulted from as little as one daily 10-min break, e.g., blood pressure, waist circumference, BMI, mood states, cumulative trauma disorders, attention span, concentration, cognitive processing, on-task behavior, bone mineral density or architecture (Donnelly et al., 2009; Economos et al., 2007; Elley et al., 2006; Jurg et al., 2006; Lara et al., 2008; Liu et al., 2008; MacKelvie et al., 2003, 2004; Mahar et al., 2006; Mark and Janssen, 2009; Metzler and Williams, 2006; Naylor et al., 2008; Petit et al., 2002; Pohjonen and Ranta, 2001; Pronk et al., 1995; Sibley et al., 2006; Yancey et al., 2009).
 - Organizational benefits may accrue, such as increased productivity (e.g., decreased eyestrain and musculoskeletal discomfort), decreased employee attrition, decreased classroom disruptiveness and higher morale (California Nutrition Network and California Department of Health Service, 2004; Crawford et al., 2004; Galinsky et al., 2007; Gibson et al., 2008; Honas et al., 2008; Lloyd et al., 2005; Pangrazi et al., 2003; Pohjonen and Ranta, 2001; Sibley et al., 2006).
 - Provider efforts to counsel or educate clients may be positively influenced (Crawford et al., 2004; Gosliner et al., In Press).
 - Spill-over (generalization) to increase active leisure may occur (Donnelly et al., 2009; Yancey et al., 2006a).

Meta-motivation model change processes and temporal interactions

Details of the proposed multi-level interactions and sequencing of diffusion within the model are summarized below and detailed in Table 3. The model proposes six levels or phases of dissemination, set in motion by marketing push organizational practice and policy changes to early adopter leaders (Fig. 1): initiating (leader–leader), catalyzing (organization to individual), viral marketing (individual to organization), accelerating (organization to organization), anchoring (organization to community) and institutionalizing (community to individual). Levels reflect progressively greater numbers of individuals and organizations or organizational units implementing the changes, eventually achieving a critical mass or “tipping point” from one level to the next.

The initiating phase of the model is from leader to leader. “Boisterous leaders” or sparkplugs, charismatic and passionate leaders committed to population-wide physical activity promotion, market opt-out policies and practices to leaders of organizations in various sectors (Dearing et al., 2006). Organizational leaders respect these sparkplugs as experts and colleagues—health professionals or researchers capable of offering cutting edge strategies to assist them in achieving their goals. Sparkplugs are the human catalysts of the changes that follow, as recess breaks are the behavioral catalysts.

The catalyzing phase is from organization to individual. Leadership by example, as well as instigating or endorsing practice changes, is critical, as is securing buy-in and ownership of key staff (program champions) at different levels within the organizational hierarchy from the outset. Opt-out practices like dance breaks and walking meetings may be introduced “under the radar,” framed as an energy boosters or stress relievers—paid time devoted to employee well-being rather than obligations imposed top-down—to

get people moving regularly without their equating it with exercise. The behavior becomes “automatic,” passive social acquiescence (“going with the flow,” taking the “path of least resistance”) resulting from affective ties, acceptance of one’s place within a hierarchy or persuasion by charismatic leaders against a backdrop of shared values (Adams et al., 2006; Hammond et al., 2000; Heward et al., 2007; Mittelmark, 1999). Of course, active participation is voluntary, but sitting out, the other option, is inconvenient and goes against the grain. Most people ration their cognitive processing power, time and energy (Halpern et al., 2007; Thaler and Sunstein, 2008; Zimmerman, 2009). Human physiology in terms of improved affect and energy associated with short bouts of modest intensity activity, along with the social aspects, reinforce the change. Routine locomotion may become less taxing and intimidating, e.g., taking the stairs rather than riding in elevators. Activity participation may then be more likely to generalize to other settings (Donnelly et al., 2009; Yancey et al., 2006a).

The viral marketing phase from individual to organization may then be activated, with buzz about the new breaks spreading through social circles both at work and outside of work. This primes the pump. When people hear recess breaks discussed in glowing terms, they may be unconsciously primed or disposed to view a subsequent opportunity to participate favorably. Personal changes build individual self-efficacy and are noticed and discussed by others, extending word of mouth spread beyond their immediate circles. Further reinforcement may be provided at routine office visits because of modest health improvements, e.g., in blood pressure or serum cholesterol. Such successes may also spur diffusion among providers.

The intra-organizational diffusion spurred by individual benefits increases within early adopter agencies, and informal communication of these benefits spills over into the broader social networks of both line staff and management, in other work units or departments and outside of the workplace. This word-of-mouth dissemination combines with early evidence of organizational benefits to drive inter-organizational diffusion. Improvements in attitude win the notice of management—greater focus and productivity, less absenteeism and attrition. This heralds the start of the accelerating phase, from organization to organization. Any apparent competitive edge attracts attention, inquiries and replication. The competitive nature of organizational heads and strong inducements from their boards of directors, customers or shareholders to out-perform their counterparts spurs communication of benefits to colleagues through social and professional networks. This, then, may lead to adoption and implementation of these practices by others.

Certain organizations’ practice and policy changes, however, directly influence key population segments that have a multiplier effect in furthering dissemination, e.g., professional sports organizations, schools, local government agencies, health and social services organizations. Replication may be facilitated by the internet, with web-based training materials, audiovisual implementation aids available online, as well as photo and video dissemination through information technology-mediated social networking. Noteworthy are the political and entertainment value, and commercial potential of such packaged activity breaks, e.g., through celebrities and popular fitness gurus developing their own products, and through the distribution channel presented by corporate wellness.

Formal recognition may follow in the form of internal monitoring and publication of productivity stats. Formal communication of organizational benefits may occur through the professional interactions of leaders, e.g., conference discussions and presentations. Innovations attract media coverage, elevating the stature of the innovation and those associated with it, accelerating dissemination (Gantz and Wang, 2009). Changes may radiate out from health and

Table 3
MVM change processes and temporal interactions.

| Level | Description |
|--------------------|--|
| Initiating | <p>Leader → Leader</p> <ul style="list-style-type: none"> • Early adopter organizational leaders across sectors may be influenced by physical activity promotion thought leaders (sparkplugs). • Marketing of opt-out practice and policy changes to leaders in various sectors focused on advantages to productivity—organizational benefits, not just health. |
| Catalyzing | <p>Organization → Individual</p> <ul style="list-style-type: none"> • Sparkplugs are the human catalysts of the changes that follow, as recess breaks are the behavioral catalysts. • Leaders implement opt-out practices and policies that fit their internal cultures and resources. • Leaders' personal commitment to "walk the talk" as well as endorse changes is key. • Buy-in through involvement and ownership from the outset of people at different levels in the organizational hierarchy is critical. • Voracious users foment excitement and guide problem-solving, e.g., program champions comfortable leading breaks and to whom others look for guidance and cultural cues. Attributes may co-exist in one person but usually different people. • Organizations with more sedentary and less affluent staff/members experience more rapid and robust positive changes than those with fitter/more affluent ones. Thus, diffusion within organizations and between like organizations/work units of larger agencies may proceed more rapidly in high-risk communities. • Government and health and social services agencies represent fertile ground due to the confluence of missions, ever-shrinking budgets and constrained resources—appointed and elected public officials increasingly seek budget-neutral ways to address and improve community well-being. • Successful in implementation produces individual benefits, spurring staff/members to disseminate messages via social networks, verbally and through role modeling. |
| Viral marketing | <p>Individual → Organization</p> <ul style="list-style-type: none"> • Buzz spreads through social circles both at work and outside of work, priming or unconsciously predisposing others to view a subsequent opportunities to participate favorably. • People in nearby divisions or work units encounter co-workers' recess activities and, perhaps despite initial derision, notice others' improved energy or affect. • Small health improvements, e.g., dropping a dress size or moving the belt in a notch creates sense of accomplishment and doesn't go unnoticed by their co-workers, friends and family, driving the word of mouth spread beyond their immediate circles. • Unexpected improvements noted on routine doctor visits, e.g., lower blood pressures or higher HDL cholesterol levels, further prompts communications and garners positive reinforcement from multiple segments of the social network. • Leaders' informal communications through their own social networks may reflect improvements they're observing in employee attitudes, e.g., less complaining and gossiping, fewer unnecessary absences, greater adherence to timelines, helpfulness. |
| Accelerating | <p>Organization → Organization</p> <ul style="list-style-type: none"> • Competitive nature of leaders and strong inducements from their boards of directors, customers or shareholders to out-perform their counterparts may spur more formal communication of benefits to colleagues via professional networks. • Certain organizations' practice and policy changes have direct influences on key population segments aiding in dissemination, social norm change or influencing decisionmakers decisions, e.g., professional sports, schools, local government agencies, health and social services organizations. • Changes spread to the other settings in which these staff, members, clients, fans, customers, or patients study, worship, live, create, advocate and play. • Changes in priorities in leaders' or managers' decision-making manifest through physical (e.g., stair improvements) and social (conformity with norms, e.g., others taking the stairs) environmental changes, making active choices more available, affordable, accessible and unavoidable. • In turn, because these staff members belong to other organizations with similar sociodemographic compositions, these changes may ripple throughout the community. • Many human services sector workers are not only decision-makers, gatekeepers, role models and change agents for their clients and patients but also within their own families and social circles. • Local government workplaces in urban areas are especially ripe for intervention because they have large, stable and ethnically diverse workforces, and internal opportunities, infrastructure and resources for policy and practice changes and institutionalizing those changes. • "News" of organizational benefits, not only in terms of productivity and health-related costs, but over time, increased visibility and brand enhancement, increased retail traffic (e.g., on-site and internet), and ultimately, sales, revenues, productivity or profits. This speeds diffusion of the innovations through professional networks of leaders and lay media, especially commercial business concerns. • Intermediate adopter leaders are then brought "into the fold," spreading individual benefits and intra- and inter-organizational diffusion. |
| Anchoring | <p>Organization → Community</p> <ul style="list-style-type: none"> • As political will grows, physical environmental interventions requiring larger investments of resources (time, finances, political capital) become politically viable (e.g., walking trail creation and promotion, light rail construction, indoor architectural innovations and amenities). • These interventions complement and grow out of the sociocultural environmental changes created by organizational practices and policies by increasing "supply" of opportunities, driving "demand" for physical activity products and services increases, and conversely, i.e., create supply in response to demand. • This, in turn, leads to further increases in demand, bringing along those much more refractory and resistant to change as the equivalent of "herd immunity" in communicable disease terminology. |
| Institutionalizing | <p>Community → Individual</p> <ul style="list-style-type: none"> • Community consensus may be memorialized and institutionalized through population social controls, e.g., laws with stiff penalties for non-adherence, e.g., for employers failing to provide regular and frequent opportunities for physical activity throughout the workday. • Gas prices may become prohibitively expensive and nearly all highways become toll roads, such that few people commute to work by car. • Strong social morés and expectations similarly impose social sanctions for sedentariness and confer support and reinforcement for being constantly on the move. Fidgeting becomes normative, and being chained to the desk outmoded. |

social services agencies and small businesses or corporations to schools, religious institutions and local and state government agencies and elected officials, to collegiate and professional sports and the fitness industry, reverberating within and between sectors. Inter-sectoral dissemination may be spurred by evidence of community benefits, heralding the start of the anchoring phase, from organization to community. Community attitudes and norms may shift. Public intolerance for prolonged sitting may grow, as was the case for smoking, and drinking and driving. Population decreases in sedentari-

ness and increases in physical activity may be captured in public health surveillance.

Growing visibility of community benefits may draw notice of federal government agencies. New regulations may be established and implemented, e.g., reserving all nearby parking for the disabled. Initially, changes likely involve modest investment of resources. However, constituent pressure may garner decisive action from appointed and elected officials, leading to the development of population social controls (rules that direct and

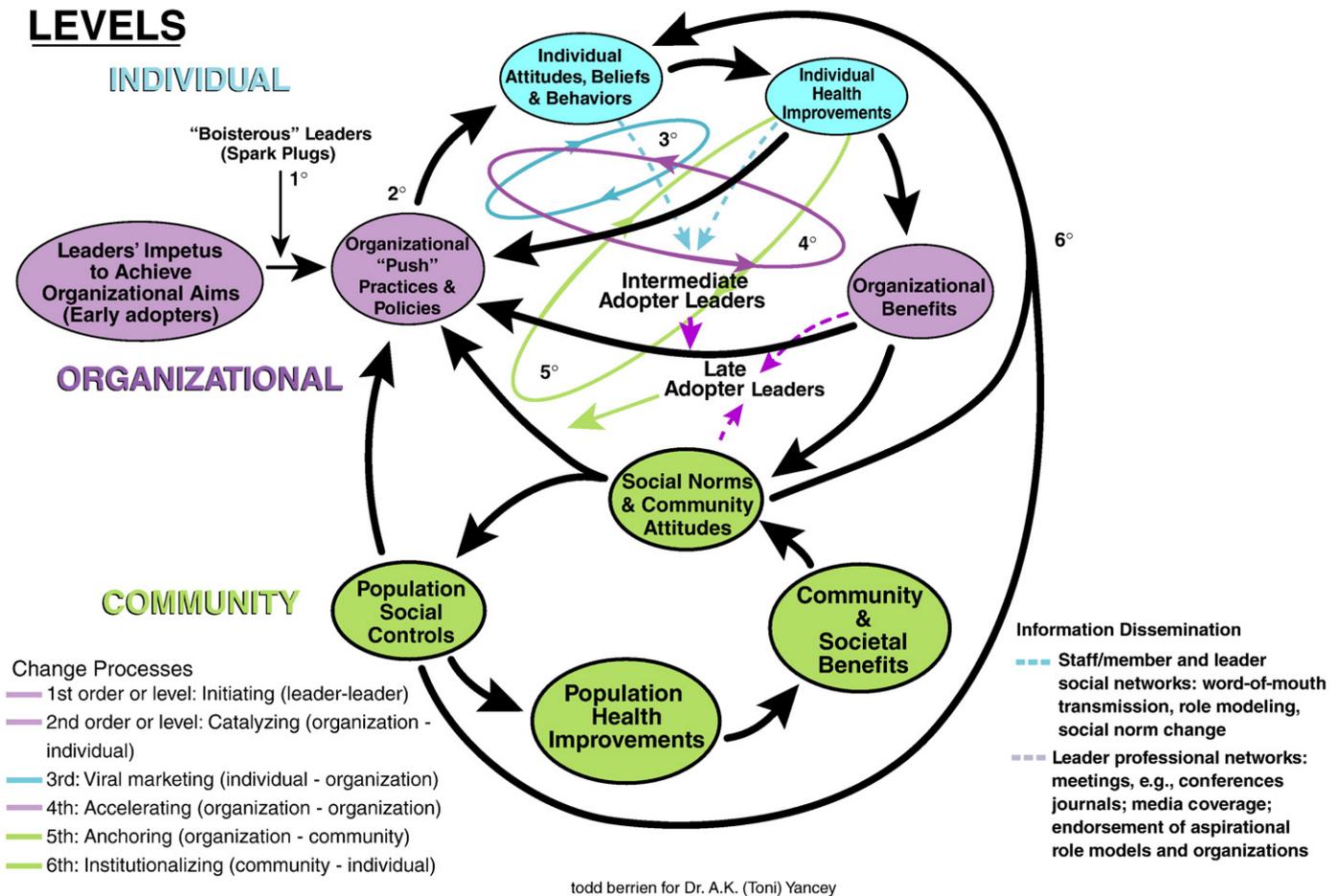


Fig. 1. Meta-volution model. A dynamic bio-psychosocial ecological theory of population health behavior change.

constrain behavior) and heralding the institutionalizing phase, from community to individual. Community consensus may be memorialized by enacting and enforcing new laws. Imposing stronger incentives and disincentives may become politically viable, e.g., workplace regulations including fines for organizational practices promoting prolonged sitting, similar to those imposed for unsafe practices. Ultimately, this would anchor and spread the changes in individual lifestyles and institutionalizes those in organizational behaviors.

Changes may become ingrained in the societal fabric. Serious consequences would be imposed for violations, like confinement or loss of privileges. Subsequent population decreases in chronic disease risk indicators captured by routine public health surveillance (e.g., NHANES) and, later, incidence and prevalence of these conditions would engender support for policies necessary for long-term sustainability that require large investments and redirection of public resources such as gas excise taxes and diversion of road construction funds to mass transit.

Theoretical underpinnings of the meta-volution model

The MVM builds upon a number of disciplines, including biology, organizational and social psychology, sociology, women's studies, cultural anthropology, communications and social marketing. Its development paralleled that of behavioral economics over the past decade. Relevant constructs from theories and frameworks informing or supporting the model are presented hierarchically from the individual to the societal levels in Table 4.

The MVM dynamically and sequentially integrates biological influences with psychological factors at the individual level, and sociocultural influences with organizational processes at the community level to explain behavior and behavior change opportunities. Fig. 2 is an expanded, microscopic, physical activity-focused version of Fig. 1. It specifies the organizational and individual change levers and progression of individual-level changes. For example, the majority of staff or members of an agency likely participate because of the social approval and disapproval meted out for (non-)conformity, and social interaction and support afforded by participating. Most people experience acute improvements in energy and affect during short exercise bouts of modest intensity, and enhanced cognitive processing in the aftermath. These benefits, more substantial in overweight and sedentary individuals, over a period of days to weeks may precipitate generalization of activity and increased exercise intensity. Attitudes of people with poorer baseline health status and fitness levels are more likely to favorably shift as a result of their participation. Over a period of weeks to months, modest improvements in health such as slight lowering of waist circumference or higher cardiorespiratory endurance may not only reinforce individuals' activity, but also begin to spill over as organizational benefits, such as increased productivity and fewer injuries. In this way, the cycles of reinforcement may operate to recruit more people and sustain their participation, as well as attract more organizations. A similar cycle of reinforcement overflowing to community attitudes and social norms may accompany the involvement of large numbers of organizations over a period of years.

Table 4
Theoretical underpinnings of the meta-motivation model.

| Discipline | Construct | Citations |
|--|--|---|
| Biology/physiology | Affect (mood, energy) Aerobic fitness Food/beverage preferences Appetite suppression Sedentary programming Cognitive processing | (Bellisari, 2008; Bixby et al., 2001; Eaton and Eaton, 2003; Ekkekakis and Petruzzello, 1999; Passe et al., 2000; Prentice and Jebb, 2000; Westerterp-Plantenga et al., 1997) |
| Psychology | Role model selection (sociodemographic similarity) Experiential learning Exercise self-efficacy Physical activity enjoyment Motivation Teachable moment Cognitive dissonance Perceived exertion Perceived weight status | (Ashby et al., 1999; Bandura, 2001, 2004; Biddle and Fox, 1998; Chen et al., 2002; Erez and Isen, 2002; Fox et al., 2000; Ratey and Hagerman, 2008; Renger et al., 2002; Valente and Pumpuang, 2007; Yancey et al., 2002, 2004a,b,c, 2006a,b,c) |
| Organizational development and business management | Phases (innovation development, dissemination, adoption, implementation, maintenance) and processes (coercive, mimetic, normative) of diffusion of new practices Phase-dependent information sources Innovation features Culture Productivity Return on investment Institutionalization | (Dearing et al., 2006; Glasgow et al., 1999; Kristal et al., 2000; Luke and Harris, 2007; Marwell and Oliver, 1993; Rogers, 2003; Steckler and Goodman, 1989; Valente and Fosados, 2006; Valente et al., 2007; Yancey et al., 1999, 2003) |
| Cultural anthropology | Cultural context and values Cultural assets Symbols and icons Community-based participatory research (intervention approaches “bubbling up” from diverse communities and settings, vs. attempt to impose or adapt those developed for affluent mainstream audiences) | (Green et al., 2001; Kagawa-Singer, 2006; Kreuter and McClure, 2004; Matsumoto et al., 2008; Parham and Scarinci, 2007; Ramirez et al., 2007; Van Duyn et al., 2007; Winger and Pargman, 2003; Yancey et al., 2002; 2004a,b,c, 2006a,b,c) |
| Sociology | Social control (formal and informal sanctions) and influence Social capital and collective efficacy Social exchange and opinion leaders | (Cohen et al., 2006; Meier, 1982; Mittelmark, 1999; Valente and Pumpuang, 2007) |
| Women's studies | Embodied context (values/ideals embodied or embraced through internal influences) Gender roles | (Brazy and Shah, 2006; Christakis and Fowler, 2007; 2008; Kushner, 2005; Tavares and Plotnikoff, 2008) |
| Behavioral economics | Individual and societal (dis)incentives Market failure Availability bias (default decisions) Framing and priming Herd instinct (crowd influence) | (Cohen and Farley, 2008; Day, 2006; Gordon-Larsen et al., 2009; Green et al., 2009; Halpern et al., 2007; Pratt et al., 2004; Sturm, 2004; Wansink and Chandon, 2006; Wansink et al., 2006) |
| Social marketing and communications | 4 P's: product, price, place, promotion Communication channels and messengers Message packaging (e.g., entertainment value) Social networks Critical mass/tipping point (to spread practice beyond minority, must be promoted by 3 types: connectors, mavens and sales people) | (Andreasen, 1995; Borgatti et al., 2009; Brodie et al., 2001; Gantz and Wang, 2009; Grier and Bryant, 2005; Luke and Harris, 2007; Maibach et al., 2007; Gladwell, 2000) |
| Social ecology and health policy | Upstream–downstream approaches Population-level intervention (reach and exposure), multi-level intervention Implementation and dissemination science, including push-pull design principles (e.g., lowering the bar to make adoption of a behavior less costly financially and psychologically by developing aesthetically pleasing products, tools and services, and providing an opportunity to test them out before committing) | (Glasgow et al., 1999; Green et al., 2009; Katan, 2006; Kersh and Morone, 2002; Kumanyika and Ewart, 1990; Kumanyika et al., 2008; Smedley et al., 2000; Stokols et al., 2003) |

Discussion

Meta-volition disengages, to some extent, personal motivation and behavior. With consistent extrinsic reinforcement over time, activity may become conditioned, embraced and self-reinforcing, spilling over to leisure time. However, meta-volition also explains how individual, organizational and societal benefits may accrue even if individual attitudes remain unchanged. Employees choosing cheaper remote parking is one example (Fenton, 2005). They may not consider it exercise, value the experience or benefits beyond cost savings, nor change their identity to reflect or incorporate their more active status.

At this early stage in population activity promotion and inactivity prevention and control, the political will to drive the large-scale changes to the physical environment necessary to achieve and sustain large populationwide increases is essentially absent. This is especially problematic in communities at greatest risk for inactivity which experience great difficulty in simply getting sidewalks repaired or streetlights replaced. Thus, the MVM argues for “mirror” actions at this juncture: early adopter leaders looking in the mirror and making immediate practice and policy changes in their own spheres of influence, within their decisional latitude, without waiting for someone else to act or something else to happen.

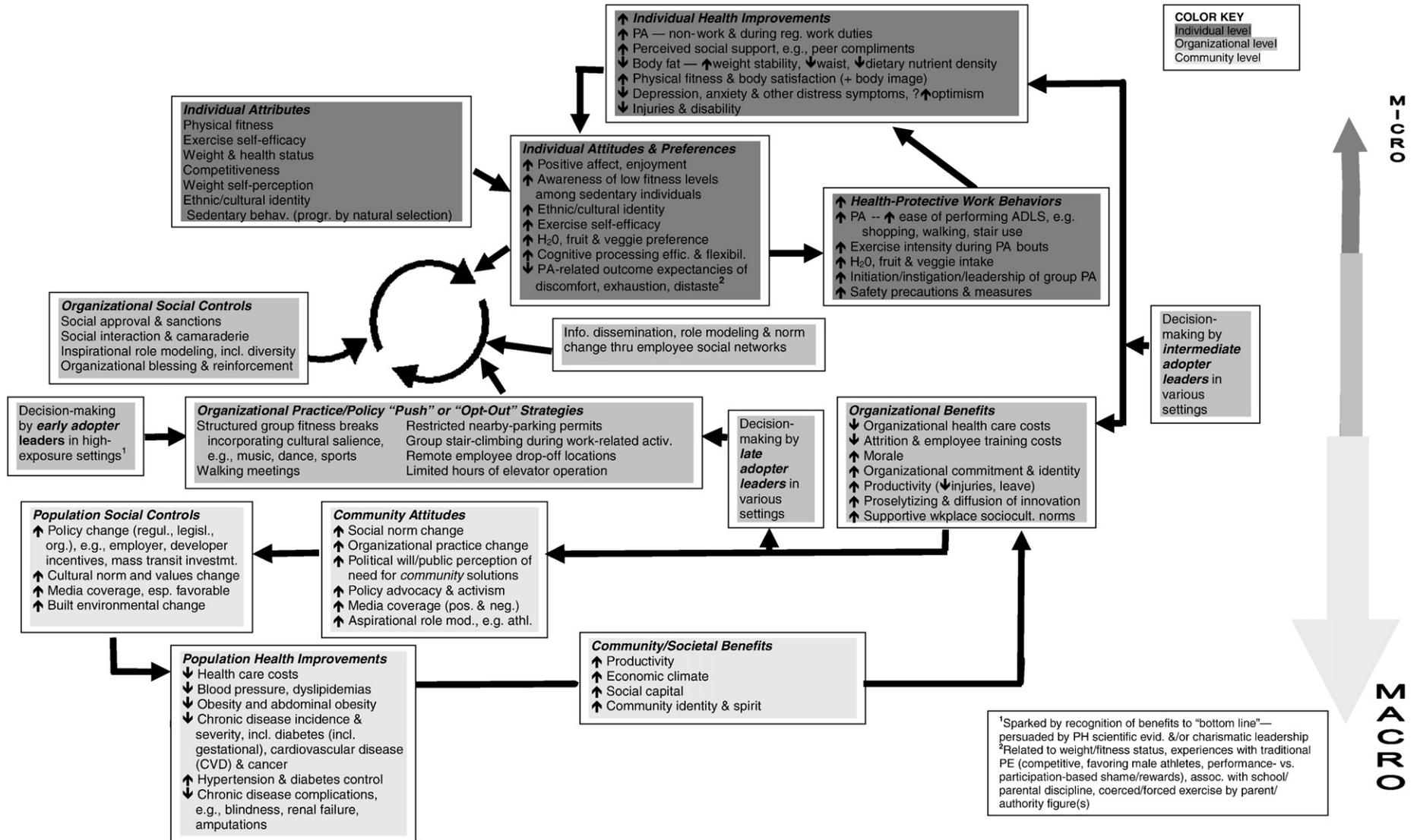


Fig. 2. Meta-volition model. A dynamic biopsychosocial ecological theory of population physical activity change.

Table 5
Lessons learned from other social movements to improve public health.

| Lesson | Example |
|--|---|
| Demonstration of tangible economic returns as well as health benefits to avoid faddism, but avoidance of “over-promising” or “over-estimating.” | Worksite wellness in the 1980's did not deliver promised medical cost savings, likely eroding support in the 1990s. Recent resurgence spurred by obesity/diabetes offers second chance. |
| Building inter-disciplinary and inter-sectoral cultural competency to promote understanding of and ongoing attention to and working through differing motivators and risks. | In working with professional sports athletes and organizations, must recognize the extreme scrutiny of the public, and jeopardy attached to appearance of failure, e.g., soliciting endorsement for policy prematurely, when passage unlikely. |
| Vigilance in highlighting successes and remaining gaps and needs to drive change upstream, converting increased political will into stronger incentives and disincentives or punitive measures to influence behavior, and into interventions requiring greater upfront investment of fiscal resources, time and disruption of status quo, e.g., redirection of highway constructions funds to mass transit, urban re-design excluding cars from shopping and business centers. | The “bully pulpit” must be carefully managed to avoid over-exposure but keep challenges present in the public consciousness, as there are many competing demands for political and social resources, e.g., the erosion of accomplishments in controlling HIV transmission in white gay men, and alcohol-related motor vehicle fatalities. |
| Engagement of underserved communities at the outset, e.g., identification of special needs and mobilization of advocacy to direct resources to low-resource areas and groups. | Tobacco control movement's failure to invest substantial resources in outreach to and involvement of ethnic minority communities, with resulting widening of smoking disparities and stirring resentment and apathy (Tauras, 2007). |
| Investment upfront in tracking, monitoring and surveillance to expose differential impacts and inequities and take quick corrective action. | |

Cautions and limitations

The MVM must be tested empirically and vetted in practice to ascertain its value to physical activity promotion. Certain relationships between constructs lend themselves readily to assessment, such as the physiological–psychosocial interaction between mood, self-efficacy, social support, fitness and activity, or social network analysis examining the flow of influence among individuals and organizations over time (Borgatti et al., 2009).

The science supporting the effectiveness of the structurally integrating brief bouts of physical activity into organizational routine is rapidly accumulating, but still in an early stage. For example, an NIH-funded, 25-worksite pilot cluster RCT of this approach was recently completed at UCLA with promising results (Yancey, 2009), and a 75- to 80-worksite full-scale cluster RCT is currently underway there. However, the urgent situation, particularly in medically underserved communities, necessitates acting on our best assessment of the available (often practice-based) evidence, not waiting for the best evidence (Green et al., 2009; Institute of Medicine (U.S.), 2006). Lessons from other social change movements may inform the model's application (Table 5).

Some might argue that such persuasion crosses the line to coercion. However, behavioral economists have asserted that public policy should take human nature into account in protecting society's interests (Thaler and Sunstein, 2008; Zimmerman, 2009). This is the same issue that anti-tobacco and healthy eating advocates grapple with (Cohen and Farley, 2008; Story et al., 2008). If humans have inherent biological propensities at odds with their environment, top-down approaches may be necessary to control population sedentari-ness (Huang and Glass, 2008).

Obviously, a number of settings such as small businesses with few employees do not readily lend themselves to opt-out policy and practice changes. Innovation by cultural insiders in these settings may succeed in adapting the model in ways not currently apparent because such low-cost wellness strategy as providing time during working hours to exercise are among the few that small businesses with limited resources can offer (Pearson and Lieber, 2009). But, like many minimal intensity environmental change approaches, this intervention seizes the “low-hanging fruit” to build momentum, capitalizing on the movement of most people in multiple social circles with opportunities for exposure, for example, at church or temple if not at work.

Implications and conclusions

Society is replete with opportunities for re-integrating physical activity into daily life. Captive audiences in appropriate settings are

ubiquitous. For example, refreshments are usually offered at work, religious and social functions and gatherings, including nutrient-rich food and beverage choices. Yet there is no penalty for cooping people up for long periods, nor is there much support for systematically interrupting prolonged sitting—it's normative! Rarely are attendees or guests “refreshed” with brief activity bouts or “snacks.” Activity snacks are cheaper to provide and just as necessary to health and well-being as nutrient-rich foods.

Pushing people to be a little more active on a regular basis can foster the daily personal and professional decisions ultimately necessary to increase communitywide physical activity participation and change social norms. Some investigators have asserted argued that policy change precedes norm change (Swinburn, 2008). History suggests otherwise, however, e.g., imposition of smoking bans as an organizational and regulatory practice change long before legislative mandates (Messer et al., 2007). Push or opt-out organizational policies and practices may generate the visibility and political will to make critical but difficult and costly built environmental investments more tenable in the long run.

Conflict of interest statement

The authors declare that there are no conflicts of interest.

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