Integrating Theoretical Approaches
to Promote Physical Activity

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Context:
Research on the promotion of physical activity has been based on a variety of conceptual models. These models generally target one level of analysis, such as the individual, community, or the environment, and differ in their relative contact with basic or applied science. There have been limited attempts to develop approaches that target multiple levels of analysis and can stimulate basic and applied research.

Objective:
Theoretical integration in a multidisciplinary field such as promotion of physical activity should take into account that social, behavioral, and biomedical colleagues may use different explanatory models, and use different approaches to the development of scientific knowledge. This essay argues for the development of integration of theory across multiple domains that can incorporate methods and findings of basic and applied scientists, and that uses language and methods common to social, behavioral, and biomedical scientists.

Method:
Behavioral choice theory is presented as an example of one theoretical approach that bridges different approaches to physical activity intervention, and that can stimulate both basic and applied research on physical activity. Behavioral research on choice was discussed in relationship to basic research, human laboratory research, and community and clinical research.

Conclusions:
Implications of behavioral choice theory for community and environmental change was discussed. The essay ends with ideas for future directions in integration of theory for physical activity research.

Medical Subject Headings (MeSH):

Integrating Theoretical Approaches
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With inactivity as a major public health problem, there have been numerous approaches suggested to modify physical activity. The Surgeon General’s report on physical activity provides an excellent overview of a variety of conceptual approaches to increasing physical activity.\(^1\) This report presents eight different models of behavior change that are focused at three levels of analysis: individual, interpersonal, and environmental.

There are distinctions other than level of analysis that can be drawn between approaches to research on the promotion of physical activity. One distinction is the extent to which research is basic or applied. Basic research is designed to develop knowledge on fundamental laws that influence behavior, while applied research uses knowledge gained in basic work. Another distinction among scientific approaches is the conceptualization of methods of inquiry as “bottom up” or “top down.” Bottom up approaches attempt to understand a phenomenon by examining the building blocks of the phenomenon. Basic scientists are often interested in understanding how the component parts work, and then attempting to relate the component to the integrated organism. The top down approach argues that you have to study the integrated organism in the context in which the organism normally behaves. Proponents of the top down approach believe that studying the component parts separately will not inform you how they work together in the complex organism.

Differentiation of theoretical approaches to a problem broadens the scope of intellectual inquiry by including a variety of assumptions, investigative paradigms, and methods of inquiry. It takes time and a body of research to understand the strengths and limitations of different theoretical perspectives. As a field matures, a more parsimonious theory or conceptual approach is

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needed that can address issues across levels of analysis, providing a common language and set of concepts that are relevant to the field. The research questions that are asked become refined, and answers often shift from complex interactions in multivariate models to more basic mechanisms that operate for selected groups of subjects.

There is another challenge for researchers interested in the promotion of physical activity. This area of research usually involves multidisciplinary collaborations. For example, a team might include specialists in behavior change, health care, and exercise physiology, interested in increasing activity, the effect of exercise on a disease process, and quantification of the changes in fitness that mediate the changes in health outcome, respectively. These investigators address different aspects of the problem using theories and methods specific to their disciplines.

Members of a multidisciplinary team can benefit from theoretical approaches that are relevant to biomedical as well as social and behavioral scientists. However, there are several factors that may impede a common theoretical approach in multidisciplinary research. First, the working models and approaches to theory that biomedical researchers often use are very different from those used by social and behavioral science researchers. Biomedical researchers often use a model of physiological regulation based on homeostatic control and positive and negative feedback. This model is generally not used in most social and behavioral science theories, with exceptions. Second, most biomedical researchers use a combination of empirically derived (inductive) and deductive theoretical models to approach a problem. Many social science approaches are strongly tied to deductive models of inquiry, and research that is not theory-based, or does not conform to the use of deductive models, is considered inferior and less likely to yield new scientific knowledge. This bias disregards the fact that theory building can include both inductive (empirical) and deductive (model testing) approaches. Both approaches contribute to knowledge, and major advances in a field are often based on new approaches and a paradigm shift, rather than knowledge derived from deductive theory testing. It is likely that a combination of inductive and deductive approaches is best.

The goal of this essay is to present a brief overview of behavioral choice theory, and show how this theory can incorporate methods and findings relevant to basic and applied investigators, using bottom up and top down approaches, across multiple levels of analysis. The goal is not to present this as the best approach to research on promoting physical activity, but rather to illustrate how investigators interested in modifying physical activity can utilize theories that address more than one level of analysis, and conceptualize problems using tools of basic and applied sciences.

**Behavioral Economics or Behavioral Choice Theory**

Behavioral economics, or behavioral choice theory, is a theoretical approach that attempts to understand decision making and how time and responses are allocated given the options available. The theory is based in part on basic research on learning, cognitive psychology and decision making, and economics. As will be illustrated in the next section, this theoretical approach has been used to guide basic and applied research across individual, community, and environmental levels of analysis. Behavioral choice theory may also be useful in bridging the gap between social and behavioral science and biomedical researchers. New comprehensive theories have combined biological control theory and learning theory with many common constructs in behavioral choice theory and biological control theory. In addition, behavioral choice theory includes a strong tradition of theory building and deductive research, as well as an equally strong tradition of inductive, or empirical, approaches to knowledge acquisition. A similarity in approaches to knowledge acquisition in the social and behavioral and biomedical sciences may make it easier to develop integrated theories across disciplines.

**Basic Research on Choice**

There are several general principles that can be derived from research on basic behavioral choice theory. These principles can be applied to sedentary individuals, who, given the opportunity between sedentary and physically active alternatives, will reliably choose the sedentary alternative. First, choice of an alternative depends on the behavioral cost. Thus, even very powerful pharmacological reinforcers, such as addictive drugs, are subject to the demands of cost. This general principle provides an empirical basis for policy decisions that attempt to reduce demand by increasing the cost of a substance. The choice of being sedentary is very responsive to cost, and reducing the accessibility of sedentary behaviors or increasing the cost of being sedentary are both methods for reducing sedentary behaviors.

A second general principle is that the choice and reinforcing value of a commodity depends in part on the available alternatives. Providing a reinforcing alternative can shift choice, without changing cost or availability of the usual choice. For example, Higgins and colleagues have demonstrated that cocaine self-administration (10 mg unit dose) in cocaine users can be reduced by providing alternative monetary reinforcers (up to $20.00). While subjects may generally choose to...
be sedentary, choice may shift if the sedentary behavior is not valued as highly as the active alternative.

The reinforcing value of the alternative is not static, but may change over time or be modified by other behaviors. Experience with the alternative can influence the extent to which an alternative can substitute for the usual choice. For example, Carrol and colleagues studied the relative reinforcing value of cocaine versus water sweetened with glucose and saccharin. For animals who were dependent on cocaine, animals chose cocaine almost exclusively. However, for animals who first had experience with sweetened water, they were less likely to become dependent on cocaine, suggesting that access to an alternative reinforcer reduced the development of drug dependence. A similar effect of experience with the nondrug reinforcer has been observed in the development of cocaine self-administration in primates. The observation that experience with an alternative nondrug reinforcer can influence the development of dependence is important as we consider how to increase activity. Early exposure to an active lifestyle may protect some from the reinforcing value of being sedentary.

A third general principle is that choice is important to motivate people to obtain a reinforcer. For example, Wollfgangmann and colleagues compared rats provided access to a choice of alcohol or water, to rats forced to consume alcohol by providing that as the only fluid option, versus a control group that had access only to water. After eight months of access to alcohol, the rats were tested for dependence, and then abstained from alcohol for three months. Rats were then reintroduced to alcohol to test the extent to which alcohol became a reinforcer. Only rats who were given the choice to consume alcohol during development of dependence chose to drink it. Being forced to consume alcohol did not establish alcohol as a reinforcer. Similarly, rats had choice or forced access to opiates for 30 weeks, were tested for dependence, and then were abstinent for 19 weeks. Only animals that initially chose the opiate self-administered it later. Thus, in order for these powerful drugs to become reinforcers, consumption had to be voluntary, rather than forced. If people perceive that they are forced to initiate activity programs as part of treatment, but do not perceive that they chose to be active, they may not be motivated to make being physically active part of their lifestyle.

A fourth general principle is that choice depends in part on the delay between choosing and receiving the alternatives. In many choice situations, the outcomes are delayed from the responses. When human subjects are provided a choice of two reinforcers immediately available, subjects reliably choose the more valuable reinforcer. But as the more valuable reinforcer is delayed, subjects may switch from the more valuable delayed reinforcer to the less valuable reinforcer that is immediately available. This phenomenon has been labeled impulsive behavior, and individual differences in the shift from more valuable to less valuable alternative is an index of impulsivity. Subjects who switch quickly as the more valuable reinforcer is delayed are more impulsive. This is very relevant to physical activity since some of the benefits of being active are delayed, while benefits of sedentary alternatives may be immediately experienced. This self-control paradigm is central to understanding choice and decision making and has provided interesting individual differences in the reinforcing value of food in humans.

Behavioral choice theory is based in part on understanding factors that influence the reinforcing value of an alternative, and thus behavioral choice theory makes contact with biological mechanisms involved in reinforcement. There is considerable interest in neurosciences in identifying the biological mechanisms of reinforcement, and progress has been made in identifying the biological basis of psychostimulant drugs and food. One of the major new theories on psychobiological mechanisms for drug reinforcement include both the dopaminergic and opioid systems. Robinson and Berridge argue that the opioid system is involved in liking, or the affective quality of a stimulus, and the opioid system contributes to the motivational drive to obtain the stimulus, which is regulated primarily by the dopaminergic system. These two systems can be activated independently. Long-term drug reinforcement, and perhaps mechanisms for many nonpharmacological reinforcers, depend on activation of the dopaminergic system, and people may be motivated to use drugs even in situations where they report not liking the drug.

Behaviors such as physical activity may not be motivated exclusively by positive reinforcement. Many studies have used a negative reinforcement model for exercise, focusing on stress reduction and negative affect reduction as motivations to be physically active. Robinson and Berridge acknowledge that negative reinforcement can make a contribution to motivated behaviors such as drug use, but they argue that in many situations, and for many people, the positively reinforcing effects of the drug predominate. This may be a relevant distinction for physical activity, since the positively reinforcing effects of activity have not received as much attention as the stress-reducing effects of physical activity.

Behavioral genetics may yield important insights into factors that influence physical activity as a reinforcer. Significant progress has been made in the genetics of the dopaminergic system for drug susceptibility and food. There has been considerable interest in the genetics of fitness, and genetic responses to training, but to my knowledge there are no data that would link genetics to individual differences in reinforcing or affective responses to activity.
Highly valued sedentary activities may compete with high-preference sedentary activity and physical activity. Children who observe that sedentary and physical activities were near, subjects chose to spend the majority of their time being sedentary. However, when the cost of being sedentary was increased, a direct relationship was observed between the degree of obesity and substitutability of physically active for sedentary behaviors. Very obese children did not switch to physical activities despite large disparities in the work required to obtain access to sedentary versus physical activities.

The cost of being physically active is related to the accessibility of physical activity, and it is not surprising that accessibility is correlated with activity levels. In a laboratory test of the influence of accessibility on choice of sedentary and physically active alternatives, we randomized sedentary male college students to groups that varied the proximity of sedentary and physical activities, with near defined as immediately accessible in the same room and far as a 5-minute walk. When sedentary alternatives were near, subjects chose to be sedentary, but when sedentary activities were far and physical activities were near, subjects spent the entire session being physically active. The requirement of making people walk for 5 minutes to get access to sedentary activities was enough to shift their choice to physical activity. This makes a strong case for reducing proximity to sedentary behaviors to prompt the choice of being active.

How powerful are different sedentary behaviors in competing with being active? Saelens and Epstein provided children the choice between physical activity and high- or low-preference sedentary activities, with preference defined by the amount of time the child spent in that activity during a baseline session. Children choose to be more physically active when given the choice between low-preference sedentary activity and physical activity than when the choice was between high-preference sedentary activity and physical activity. Highly valued sedentary activities may compete with physical activity more than lower valued sedentary activities.

The observation that children are more physically active when the alternative is a lower preference sedentary behavior suggests that reducing access to high-preference sedentary behaviors may increase activity. We found in a series of laboratory studies that reinforcing obese children for decreasing high-preference sedentary activities such as television watching and video game playing was associated with increases in physical activity that are similar to the changes that occur when physical activity is reinforced. These studies also suggest that sedentary activities do not readily substitute for each other. If sedentary activities were completely substitutable, children would replace all prior time spent in high-preference sedentary activities with time engaged in low-preference sedentary activities.

Liking of activity is often considered to be an important influence on activity, but liking represents a different construct than reinforcing value, with a different psychobiological basis. To test the influence of liking of different physical activities on choice, Epstein et al. gave children the choice of a highly liked sedentary activity and either a highly liked physical activity or a least liked physical activity. When the sedentary and physical activity options were equally available in both tasks, children chose to be sedentary. Children decreased their choice of being sedentary with increasing cost for sedentary activity, but the point of switching to physical activity was the same regardless of whether the physical activity option was highly liked or least liked.

If sedentary behaviors are more reinforcing for some people than being active, perhaps sedentary behaviors can be used to reinforce these people for being more active. Saelens and Epstein studied whether making sedentary activities such as video game playing and watching movies on a videocassette recorder contingent on riding the cycle ergometer would increase physical activity. In a control group, being active or sedentary was freely available. Children in the contingent group dramatically increased their physical activity to get access to television activities even though other sedentary activities were freely available, whereas those in the control group remained sedentary. There may be considerable potential for motivating activity by arranging access to sedentary activities that are normally freely contingent upon physical activity.

Community and Clinical Studies of Choice of Physical Activity

One of the first studies to highlight the choice among active alternatives was by Brownell and colleagues who observed over 45,000 choices of people taking the stairs or an escalator in a shopping mall, train station,
and bus terminal. After collecting baseline data, a colorful sign depicting a heart using the stairs was placed at the choice point between the escalator and stairs. The use of the stairs doubled, and remained doubled over 15 days. The use of stairs decreased when the sign was removed. These results show that small prompts to be active may alter choice of physical activity. The influence of a sign to modify stair versus escalator use was recently replicated.34

Wolffgramm and Heyne20 found that in basic animal research, choice of a behavior is important for motivation to repeat that behavior. In naturalistic settings, perception of choice may be as important as actual control of choice. Thompson and Wankel35 studied females who had enrolled at a health club and were randomized to one of two groups. Subjects were asked their activity preferences, and then randomized to groups who were provided a standardized exercise program set up by the staff, or subjects were told their program was based on individual preferences. At the end of the six weeks, adherence was significantly greater for subjects who perceived that they had choice over their exercise program, versus those who did not have choice.

The generalizability of laboratory studies that reduce access to sedentary behaviors14 was tested for obese children participating in family-based weight control programs. Children and their families were randomized to groups in which they were reinforced for being more active, reinforced for being less sedentary, or reinforced for the combination of the two.36 All children were provided the same dietary changes. At one year, the best changes in obesity were seen for children reinforced for reducing sedentary behaviors. Each group showed similar changes in fitness. The improvement in weight control was probably due in part to shift in allocation of time from sedentary to physically active alternatives, and to a decrease in eating opportunities as time in sedentary behaviors was decreased.

There are additional studies that suggest that increased choice and control are related to better adherence to activity programs. King and colleagues randomized sedentary elderly adults to structured aerobic exercise conditions at exercise sites versus home-based exercise where subjects had more flexibility regarding when and where to exercise. Long-term results showed better maintenance for the home-based, rather than site-based exercise programs.37 Perri and colleagues similarly showed that home-based exercise programs were superior to site-based programs for the treatment of obesity.38 More flexible, lifestyle activity programs are also associated with better weight loss up to two years after initiation of treatment in obese children.39,40

Behavioral choice theory provides a rich theoretical framework for understanding how people make choices, and therefore may be able to improve predic-

Community and Environmental Implications of Behavioral Choice Theory

Behavioral choice theory has been extended to community interventions and used to influence policy decisions for important community problems such as drug use,12,13 energy conservation,44 and obesity.45 One extension of behavioral choice theory is to increase the cost of drugs, thereby reducing their use. Increasing the tax on drugs can reduce demand, but the influence will be greater in situations in which the reinforcing value is less, as in new users, or situations in which there are other powerful alternative reinforcers.12 Likewise, taxing can influence food consumption. Brownell has argued that the increase in obesity is due to a toxic environment that fosters increased intake of food and decreases activity. Taxing snack foods significantly reduced snack food intake in California,46 which is easy to understand given the vast options available to consumers of acceptable food alternatives. Obviously, increased cost of engaging in a behavior will be less effective if substitutes are not available.

There are potential monetary incentives that could be used to influence physical activity at the community level. Incentives could include reduced insurance premiums for regular exercisers, or tax rebates for businesses that arrange environments that promote activity, or direct reinforcement for regular exercise, with the amount of exercise related to the amount of rebate at a health club. It might be interesting to consider taxing people for car use, with the money being used to increase access to active modes of transportation to
work. Pay-per-view television, more costly movies, and increasing the cost of video games might influence the level of sedentary behavior, though it is difficult to imagine the circumstances that would give rise to these policy decisions.

It is not necessary to use monetary incentives to promote physical activity. Behavioral choice theory suggests that environmental changes that both increase the proximity and convenience of physical activity and decrease access to sedentary activities can increase physical activity. Unfortunately, environments have become saturated with labor-saving and convenient sedentary activities that decrease the need to be physically active. It is possible that such sedentary environments have increased the value of sedentary activities or decreased the value of physical activity, both of which would contribute to higher rates of sedentary activity. Interventions that increase access to opportunities for being active, such as creating bicycle lanes, providing more opportunities for children to be active, and ensuring that indoor walking is available for inclement weather, may have some impact on activity. Likewise, reducing access to sedentary behaviors may have an impact on activity, as people have to make choices about new ways to allocate time. It is logical that interventions that both increase access to active opportunities as well as decreasing access to sedentary behaviors are most likely to have long-term success.

There are many things that are possible in contemporary workplaces that could increase activity by modifying lifestyles. A great example of a choice situation in many workplaces is the choice to take the elevator or the stairs. This choice may be influenced not only by the motivation to be more active, but by accessibility to elevator or stairs. It is more common to have easy access to an elevator that is well lighted and freshly painted, while the stairs are hidden, locked, or dirty. It would be interesting to assess stair use in situations in which the stairs are easily accessible and brightly lit, with music activated by the footsteps, while the elevator is hard to find and dimly lit. Choice of stair use over escalator or elevator is a good target for environmental studies, as research has shown it may be relatively easy to modify.33,34

The incorporation of increased activity into lifestyles is one of the most interesting new approaches to promoting physical activity. One very important component of lifestyle exercise is using transportation as a form of exercise. Walking or bicycling to work would provide the opportunity for many people to get all the exercise they needed in a day, without the need to find additional time to be active. Businesses would need to provide opportunities for employees to have lockers and a place to shower to take advantage of using transportation as a form of physical activity. It would be interesting to evaluate this by studying a sample of people who lived within two miles of work, and had safe walking routes.

Finally, as community, environmental, and policy approaches to physical activity are considered, it is important to keep in mind the importance of choice and the perception of control in developing options for being active. There is a delicate balance between aggressively promoting, encouraging, and reinforcing physical activity and the need to boost self-regulation and control. At a policy level, it is often assumed that restriction of things that are bad for you is the best approach, and the more restriction, the better the approach will work. However, restriction is a powerful method for increasing the reinforcing value of the behavior that is being restricted. Reduction can also take place by reinforcing people for reducing their behavior, rather than restricting access to the behavior. For example, we were able to increase activity and decrease liking of being sedentary more by reinforcing sedentary children for being less sedentary than by removing the television, VCR, and computer games that were competing with being active.16

Ideas for Future Research

The purpose of this paper was to encourage investigators to integrate theoretical perspectives that address multiple levels of inquiry. This includes paradigms within the social and behavioral sciences that may target different levels of influence, as well as paradigms that can bridge basic and applied interests, as well as top-down or bottom-up approaches to knowledge acquisition.

This paper dealt with one approach, behavioral choice theory, that can serve as an example of a theory that can organize and stimulate research across multiple levels. This discussion will focus on two issues, future directions in theory integration for physical activity, and future directions for behavioral choice theory in physical activity research.

Future Directions in Theory Integration for Physical Activity

Physical activity research has benefitted from social and behavioral science research, whereas physical activity research in biomedicine has often contributed to fundamental new knowledge. Attempts to assess whether social and behavioral science research in physical activity can develop fundamental new knowledge or theory are needed.

Theories can be developed in part from new principles or advances in fields other than social and behavioral science. There are numerous examples of this in regard to basic theory construction. For example, behavioral choice theory has borrowed considerably from
economic theory, behavioral momentum theory has borrowed from physics, and new approaches to nutritional assessment have borrowed from developments in cognitive psychology.

The use and development of theoretical approaches that are accessible to both biomedical and social and behavioral scientists are needed. When possible, integrative approaches that utilize common theoretical constructs should be encouraged. An excellent example of this is the use of negative feedback theory in social comparison research.

Differences in use of inductive and deductive theorizing across social and behavioral sciences and biomedical sciences should be better appreciated, and both approaches to knowledge acquisition integrated in future theoretical development for physical activity.

More rigorous evaluation of what constitutes theory and theoretical models is needed, rather than elevating ideas and conceptual approaches to physical activity as theories. It should be possible to confirm, or disconfirm, theories applied to physical activity research, such that some theories are tested and discarded. It is generally the case that lists grow, rather than shrink, with more research. No one wants to offend particular groups of investigators, and few theories are disconfirmed and discarded.

It is common in the social and behavioral sciences to make distinctions regarding controlling variables or mechanisms in terms of opposing classes of independent variables, such as mind versus body, psychological versus physiological, or environmental versus genetic, when the distinction is more an issue of level of analysis than difference. A better appreciation of the integration of these positions in physical activity research is needed.

Future Directions for Behavioral Choice Theory

Considerable progress has been made in understanding the substitutability of sedentary and active behaviors, as well as substitutability within classes of sedentary behaviors. People will shift from being sedentary to being active if the cost of being sedentary increases, and people will not choose sedentary behaviors if access to them is reduced. The types or variety of physical activities used as alternatives to being sedentary have not influenced physical activity when the alternative is highly liked and preferred sedentary behaviors. However, the types of sedentary behaviors provided as alternatives to the physical activities may be very relevant. Reducing access to highly preferred sedentary behaviors shifts activity, while reducing access to less preferred sedentary behaviors has little effect on activity.

Additional research on individual differences in the reinforcing value of physical activity or sedentary behaviors is needed. People may be inactive because they find sedentary behaviors reinforcing and/or because they do not like to be physically active. Individual differences may assist investigators in matching interventions with the characteristics of the sedentary subjects. If there are individual differences, are they influenced by genetic factors? Will developing a better understanding of genetics and reinforcement provide clues to why people differ in their motivation to be active? Are these individual differences influenced by learning? Can environments be arranged that maximize the development of a motivation to be active? Ideas about choice of being active, rather than forced activity; the use of activity as a reinforcer, rather than an instrumental response; pairing physical activity with pleasant associations; and the arrangement of environments that foster physical activity and suppress being sedentary may provide theoretical constructs that can enhance learning to be active.

Can deprivation of physical activity be used to make activity more reinforcing? As deprivation increases the reinforcing value of food, can deprivation increase the reinforcing value of being active? According to disequilibrium theory of reinforcement, reducing physical activity below baseline levels would result in an increase in the reinforcing value of activity. It would be interesting to determine if these brief shifts in reinforcing value could be used to produce more permanent shifts in the level, and reinforcing value of activity.

Behavioral economic analyses of physical activity bring into focus the significant impact that environments have on our choices. More research is needed that focuses on the influence of environmental context to increase access to activity, increase the reinforcing or punishing influence of the environment on physical activity, and establish the influence of the environment on reducing access to sedentary activities.

Is the low level of physical activity in part due to environmental constraints on activity, or prompts to be inactive, and might more progress be obtained by focusing on environmental and policy issues than on individuals’ physical activity?

Research is needed on behaviors that compete with being active. How reinforcing is it for some people to be sedentary, and can we develop physically active substitutes to being sedentary? If this is not possible for some people, how much constraint is required on the sedentary alternatives to shift choice from being sedentary to being physically active?

Research on the reinforcing value of physical activity is needed that focuses on distinctions among physical activities made by exercise physiologists that influence fitness. For example, is exercise intensity related to the motivation to be physically active? Are there important motivational differences among types of activities, such as aerobic, stretching, or resistance activities? Are there
entry activities that may stimulate other activities, or is the motivation to be active specific to each physical activity?

It should not be assumed that the choice of being physically active is stable over time. It may shift as a function of the alternatives available, competing demands on the person, and shifts in the reinforcing value of activity if a person habituates to the positive sensory experiences associated with being active, or satiates to a particular activity. Interventions may have to be adjusted, or modified over time as shifts in the relative reinforcing value of the available choices changes.

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