Influences on Physical Activity of Children, Adolescents, and Adults

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ORIGINALLY PUBLISHED AS SERIES 1, NUMBER 7, OF THE PCPFS *RESEARCH DIGEST*.

HIGHLIGHT

"Understanding the many factors that influence physical activity may help improve the effectiveness of physical activity intervention programs. Research suggests that the effectiveness of programs should be maximized when participants' confidence about their ability to continue physical activities is nurtured, they enjoy the activities they have chosen, receive encouragement and assistance from other people in their lives, and reside in a supportive environment that provides convenient, attractive, and safe places for physical activity."

The U.S. Department of Health and Human Services has adopted a policy of increasing regular physical activity of children, adolescents and adults, because of the numerous health benefits that have been documented through research (Bouchard et al., 1994). The physical activity guidelines are published in *Healthy People 2000* (USDHHS, 1990). The Surgeon General's Report, *Physical Activity and Health* (USDHHS, 1996) concludes that most Americans are not physically active enough to optimize their health, and a sizable percent of adults are extremely sedentary.

Before launching large-scale programs to stimulate more physical activity, it is widely accepted that a better understanding of the various influences on physical activity habits is needed. If the most important influences can be identified, then they could be targeted for change in educational or other intervention programs. In this paper, some of the theory and research on "determinants" of physical activity are summarized, and both the commonalities and differences between youth and adults are described. An attempt is made to apply these findings to the improvement of physical activity intervention programs.

EXPLAINING HUMAN BEHAVIOR

Human behavior is complex enough to frustrate all attempts to explain it, but the attempts continue because of the importance of the task. Efforts to explain individual differences in physical activity are further complicated by variations in frequency, intensity, duration, and type. The objectives in *Healthy People 2000* (USDHHS, 1990) call for decreases in sedentary behaviors and increases in light-to-moderate, vigorous, strength-building, and flexibility-promoting activities. The influences may differ for each of these categories of physical activity. Most of the research work to date has focused on vigorous exercise in leisure time, but some studies are beginning to examine the influences on moderate-intensity activities, like walking (Hovell et al., 1992), that are now emphasized in public health recommendations because of their health benefits (Pate et al., 1995). There are many studies of special populations, such as cardiac patients, but the pres-ent paper focuses on physical activity in the general population.

Theoretical models are the starting point for research on human behavior, because theories simplify the complex phenomena under study by suggesting which factors should be studied. Psychological models that emphasize the role of knowledge, beliefs, attitudes, motivations, and emotions have been dominant and have inspired studies that have shown many psychological factors influence physical activity patterns of adults and youth. These models include the theory of planned behavior (Godin & Shephard, 1990) and the intrinsic motivation model (Whitehead, 1993).

Other models take into consideration that beliefs and perceptions are not the only influences on physical activity. The behavior of others and factors in the external environment can also play a role in influencing physical activity. Social cognitive theory (Bandura, 1986) emphasizes multiple influences from within the person, the social environment, and the physical environment.

Over 300 studies of the influences on physical activity have produced a scientific literature rich with information, but the picture is not yet entirely clear. The following sections summarize some of the major findings, and readers desiring more detailed information can consult recent reviews (Dishman & Sallis, 1994; Sallis & Owen, 1998; USDHHS, 1996).

BIOLOGICAL AND PSYCHOLOGICAL INFLUENCES

Biologic factors are strongly associated with level of physical activity, even though it is not clear these factors actually "cause" physical activity to vary. Age is a potent predictor, and the level of physical activity is known to decrease throughout the entire age span, beginning at least with entry into school. During the school years, the activity level declines about 50% (Sallis, 1993), and the decline continues until the typical elderly person is almost entirely sedentary (USDHHS, 1996). Females are less physically active than males at virtually all ages (Pate et al., 1994; USDHHS, 1996), but many people feel this difference is due to socialization rather than biology.

A biological reason why adults drop out of vigorous exercise programs is musculoskeletal injuries. In one study, injuries were the most common reason for dropping out (Sallis et al., 1990), and the history of injuries is a good predictor of future injuries. Though most people believe the obese are less active than the normal weight, it is difficult to find evidence to support this notion in either adults or youth. However, recent studies indicate that a substantial portion of physical activity may be explained by genetic factors (Pérusse et al., 1989).

The personal characteristics of being well educated and affluent are consistently associated with higher levels of leisure time physical activity. African Americans and Latinos are usually found to be less active than Anglos, even in childhood (McKenzie et al., 1992). However, these ethnic differences are largely due to socioeconomic factors (Shea et al., 1991). It is surprising that health behaviors such as cigarette smoking, dietary habits, and alcohol consumption are not consistently related to physical activity habits, but it appears that people selectively choose their health behaviors. Recent physical activity predicts future activity in leisure time, but activity levels in childhood are not reliable predictors of exercise habits in adulthood. One explanation is that children may be taught activities, like team sports, that are difficult to carry over to adulthood.

A wide variety of psychological factors appear to influence participation in physical activity among adults. Much of our current understanding can be summarized by stating that beliefs and perceptions that are not personal in nature, such as knowledge about exercise, personality traits, and general attitudes, are weakly related to behavior. Personal beliefs about one's own physical activity are usually found to be significant influences on physical activity. One of the strongest predictors of future activity is perceptions of personal efficacy, or confidence regarding one's ability to be active on a regular basis. Simple ratings are useful in predicting activity levels among adolescents (Reynolds et al., 1990) and adults of all ages (Garcia & King, 1991; McAuley, 1992; Sallis, Hovell, Hofstetter, et al., 1992). Program leaders could use such ratings to estimate which participants are likely to continue activity and which are at risk of dropping out.

There is a growing literature that supports the common belief that people must enjoy physical activity if they are to continue. Enjoyment appears to influence the activity levels of both children (Stucky-Ropp & DiLorenzo, 1993) and adults (Garcia & King, 1991). One of the main influences on enjoyment is the amount of exertion required by the activity. Children (Epstein et al., 1991) and adults (Garcia & King, 1991) prefer activities with lower levels of exertion, and dropout rates are higher from vigorous activity than from moderate-intensity activity (Dishman & Sallis, 1994). One of the reasons behind the recent emphasis on encouraging people to engage in moderate activities (USDHHS, 1990) is that more people are expected to adhere.

Every sedentary person seems to have a reason for not being active, and knowing what those reasons are can provide clues about how to design an intervention. It is well known that the most common reason is "lack of time." In addition, the number and strength of perceived barriers to activity are consistently related to physical activity in both adults (Sallis, Hovell, Hofstetter, et al., 1992) and adolescents (Tappe et at., 1989).

Psychological influences on children's physical activity have not been widely researched, in part because of the difficulties of assessing psychological states in children, and in part because parents and teachers select and control many of children's physical activities. Most children enjoy "playing," but our research group has encountered many children in elementary schools who complain, in the same way adults do, they do not have the time for physical activity.

SOCIAL AND PHYSICAL ENVIRONMENT INFLUENCES

Significant others can make it more or less likely that a person is active on a regular basis. Social influences on physical activity are strong for people of all ages, but the nature of the support varies with developmental level. Social support for adults can come from friends, coworkers, or family members, and the main types of support are encouragement, participating m physical activities, and providing assistance, such as child care (Dishman & Sallis, 1994). For adolescents, the influence of peers is paramount. If a given adolescent identifies with a peer group that values and participates in physical activity, the group creates a supportive environment for its members. If the main peer group devalues physical activity, this is an effective deterrent.

The younger the child, the more influential parents are. Studies of children aged 9 to 13 years have shown there are several ways that parents can support children's physical activity. Serving as active role models and providing encouragement may have limited influence, but two studies show that parents can have the most impact by directly helping children be active. Parents who participate in activities with their children (Stucky-Ropp & DiLorenzo, 1993), organize activities (Anderssen & Wold, 1992), or transport children to places where they can be active are the most effective supporters (Sallis, Alcaraz, et al., 1992). For preschool children, prompts and encouragement to be active can be helpful (Sallis et al., 1993).

It seems self-evident that physical environmental factors such as climate and weather can have a major effect on physical activities, but few of many possible environmental factors have been documented in research. It is probable that changes in the environment have made it necessary to focus attention on increasing physical activity. Automobiles, television, computers, labor-saving devices, and sedentary jobs have created an environment that makes possible a profoundly sedentary lifestyle for large numbers of people, maybe for the first time in history. Thus, it is critical to be aware of the effect of our artificial environments on physical activity levels (Sallis & Owen, 1998).

A supportive environment for adults might consist of a safe and attractive space for outdoor activities, exercise equipment or supplies in or near the home, and convenient access to exercise facilities and programs. One study showed that adults were more likely to be active if they had a number of exercise facilities within a short distance from their homes (Sallis et al., 1990). For adolescents, it may be especially important to have organized activities in convenient locations, such as afterschool intramural teams.

A supportive environment is essential for younger children. Because it is difficult for children to be active indoors, time spent outdoors is highly correlated with physical activity levels (Klesges et al., 1990; Sallis et al., 1993). Many parents are concerned about the safety of the their neighborhoods and prohibit children from going outside to play. Unfortunately, the more parental rules that limit children's play, the less physically active young children are (Sallis et al., 1993). The more places the child can play that are within walking distance from home, the more active the child is (Sallis et al., 1993). Balancing safety concerns with the need to let children play outdoors is a serious challenge.

Television is a ubiquitous part of the environment of children, adolescents, and adults that encourages sedentary behavior. However, there is little indication that children or adults who watch the most television are the least active. There is reason to limit the hours per week children watch television, because of associations between amount of television viewing and obesity (Robinson et al., 1993).

APPLYING THE RESEARCH TO THE IMPROVEMENT OF PROGRAMS

The research on influences on physical activity provides information that may be useful in more effectively promoting physical activity in individuals or groups of adults and youth. Figure 4.1 is a checklist that can be used to assess some of the key influences. Steps can then be taken to modify these influences so that physical activity is facilitated.

The biological and demographic influences are not easily changeable, but they provide some index of risk. A person or group with a low score on this section may need additional assistance in developing regular physical activity habits.

The higher the scores on the Psychological, Social, and Physical Environment sections, the more likely the person or group is to be physically active. Ideally, there are some checks in all of the sections. If there are few checks in a section, consider how to make changes in some of the influences listed. This checklist provides a rough assessment of existing resources and strengths as well as an indication of areas that need improvement. The reader is challenged to use this assessment to guide appropriate changes in personal or other physical activity programs.

FIGURE 4.1

Assessing influences on physical activity.

Check those that apply. Each check represents an influence that supports physical activity.

Biological and Demographic Influences

- Age. One check if less than 50; two checks if less than 18 years.
- Male sex.
- No (or minor) history of activity-related injuries.
- Genetics. Both parents led active lifestyles.
- Graduated college (for children, one parent graduated college).
- White-collar occupation (for children, parents have white-collar occupation).

Psychological Influences

- Self-efficacy. High level of confidence in ability to do regular physical activity.
- Enjoy physical activity.
- Belief that time for physical activity can be found.
- Perceive few barriers to doing regular physical activity.
- Strong intentions to be physically active.
- Belief that personal benefits of physical activity outweigh the costs.

Social Influences

- Friends or family are active role models.
- Friends or family encourage physical activity.
- Friends or family participate in physical activity with you.
- Friends or family directly help you be physically active.

Physical Environment

- Weather or climate is favorable for preferred activities.
- Feel safe being active outdoors near home.
- Attractive outdoor space is convenient.
- Exercise facilities or programs are convenient and affordable.

Exercise equipment or supplies in home.

SUMMARY

Many health benefits of physical activity are documented, but large numbers of Americans are not engaging in the recommended levels of physical activity. Understanding the many factors that influence physical activity may help improve the effectiveness of physical activity intervention programs. Research suggests that the effectiveness of programs should be maximized when participants' confidence about their ability to continue physical activities is nurtured, they enjoy the activities they have chosen, receive encouragement and assistance from other people in their lives, and reside in a supportive environment that provides convenient, attractive and safe places for physical activity.

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