

Communicating hearing protection behaviors in adolescents

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ABSTRACT

The relationship between social influence and adolescent health behaviors, like hearing protection, has come into sharp focus in the last few years, after nearly a half century of research. There have been intensive school-based interventions in the areas of smoking, drug abuse, skin cancer, and more recently, exercise and obesity. These studies clearly demonstrate that, in addition to awareness and knowledge, attitudes, social normative expectations, and self-efficacy are critical to understanding adolescent motivations concerning risky behaviors. Psychosocial theories, such as the Theory of Reasoned Action and Planned Behavior, have been found to be highly predictive of adolescent intentions to behave in a certain way, and these in turn are predictive of actual behavior. Hearing protection is a health behavior that requires a targeted effort to create new normative expectations in the adolescent population. This can only be done by adopting tested behavioral theories and using them to guide each intervention. It is incumbent upon hearing conservation researchers and advocates to examine the health behavior and communication literature where a large reservoir of research is waiting to be exploited.

INTRODUCTION

A number of efforts have been made in the United States to develop educational programs aimed at teaching children how to protect themselves from damaging levels of noise (for a recent survey, see Folmer et al. (2002)). The existing programs are varied and innovative, and have made valuable contributions to our knowledge of how to address the need for hearing conservation programs geared to young people. However, as with many other public health problems, there are substantial barriers to acceptance of the hearing conservation message. Surveys have demonstrated that even when teens are knowledgeable about the hazards of noise exposure, they do not use hearing protection (Koski & Sobel 2006). Thus, there is a continuing need to find better and more effective methods for prevention of noise-induced hearing loss (NIHL) among U.S. children and adolescents.

In this regard, the knowledge and experience gained by effective health communication interventions can be applied to adolescent hearing loss prevention programs. Informative conceptual models can be found in the health behavior literature. These models have been tested in a variety of settings over many decades. Continuing health interventions that examine changes in awareness levels, attitudes, and risky behaviors have supported their key constructs.

The theoretical models below have been applied to many disparate behaviors affecting our health, and they have been tested on diverse populations. Interventions attempting to prevent smoking, drug abuse, pregnancy, skin cancer, HIV/AIDS, violence as well as other risky behaviors are replete in the health behavior literature. While individual health behaviors can be substantively different from one another (for example, using sun screen to protect the skin, as opposed to reducing dietary fat to lower cholesterol), the information gleaned from relevant risk reduction research can provide a guide for hearing loss interventions in the future.

The National Cancer Institute report "Theory at a Glance" (2005) classifies theories by whether they apply to the individual, the relationships between individuals, or the interrelationships between people and structures in their community. Intrapersonal level theories predict how knowledge, attitudes, beliefs, and other traits within the individual will affect health behaviors. Interpersonal level theories predict how our relationships with significant others affect our social identity and normative expectations, and how these in turn will affect our health behaviors. And finally, community level theories predict how regulations and policies can affect health behaviors. For the purposes of this paper, our main focus will be on intrapersonal and interpersonal levels of theories that have particular relevance to hearing conservation programs at present. Four theories are featured below (see Table 1).

Table 1: Constructs of four health behavior theories

Theory	Constructs	Change Strategies
Intrapersonal: Transtheoretical Model (Stages of Change)	<p>Self-efficacy: confidence in ability to perform task</p> <p>Self Awareness: self reevaluation and self liberation are needed to move from stage to stage</p> <p>Decisional Balance: weighs pros and cons of changing behavior</p>	Match strategy to individual's stage of change
Intrapersonal: Theory of Planned Behavior and Theory of Reasoned Action	<p>Attitude: personal evaluation of the behavior</p> <p>Intention: likelihood of performing the behavior</p> <p>Subjective norm: whether significant others believe the behavior is important</p> <p>Perceived behavioral control: whether individuals believe they can control the behavior</p>	Social pressure, public contract-making, influencing social norms; modeling of behavior by significant others
Intrapersonal: The Health Belief Model	<p>Susceptibility: perceived susceptibility to health threat</p> <p>Severity: perceived severity of health threat</p> <p>Perceived Benefits: benefit of acting to avoid threat</p> <p>Perceived Barriers: costs of taking action</p> <p>Self-efficacy: confidence in ability to perform task</p>	Provide concrete "how to" information; promote awareness; use reminder systems
Interpersonal: Social Cognitive Theory	<p>Reciprocal determinism: mutual influence of person's behavior on environment and environment on person</p> <p>Behavioral capacity: skill at performing a behavior</p> <p>Expectations: anticipated outcome of behavior</p> <p>Self-efficacy: confidence in ability to perform task</p> <p>Observational learning: learning via modeling behavior of others</p> <p>Reinforcements: responses to behavior that influence the likelihood of reoccurrence</p>	Peer modeling, role play, mentoring programs

Intrapersonal Theories: The Transtheoretical Model

The Transtheoretical Model (also called Stages of Change), advanced by Prochaska and colleagues (1994, 1996) focuses on an individual's readiness to make a change in behavior. The underlying principle of this model is that behavior change is achieved through various stages. The first stage, precontemplation, is a stage in

which individuals are content with “unhealthy” behaviors and are not thinking about making any changes. At the next stage, contemplation, individuals are aware that behaviors they engage in are risky, and are planning on taking action fairly soon, such as within the next six months. The third or preparation stage involves preparatory actions for making the behavior change, such as acquiring an exercise machine or signing up for a weight loss program. The action stage is when behavior changes are initiated. During the maintenance stage, individuals strive to maintain the new behavior. Finally, at the termination phase, the new behavior is performed consistently and without apparent tendencies to revert to the prior, unhealthy behavior.

In Prochaska’s presentation of this model, it was explicitly recognized that individuals do not all go through the various stages at the same pace, and the different stages are not necessarily reached in sequential order. Messages will vary according to the apparent stage of change through which individuals or groups are moving. Specific transtheoretical model constructs include: self-efficacy, or confidence in the individual’s ability to perform the task, self-awareness for re-evaluation of attitudes, and the ability to weigh the pros and cons of the behavior.

The Stages of Change model has been applied to a number of health behavior studies, some of which have been reviewed by Prochaska (1996). One successful application was a smoking cessation program, where it was found that adapting the program to a given smoker’s current phase made the program more effective. The model has also been applied in attempts to promote healthy behaviors associated with HIV prevention, alcohol abuse, diet and weight control, and sun exposure (Prochaska et al. 1994).

Recent research continues to demonstrate the usefulness of this model. A study by Hacker and colleagues (2005) found that the Transtheoretical Model was a useful tool for promoting pregnancy prevention and disease prevention in teens. Hollis et al. (2005) tailored tobacco reduction messages for teens based on their smoking status and stage of change, with significant results. Aveyard et al. (2003) used the model to measure the effects among teens who dropped out of a smoking cessation program. Kristjánsson et al. (2003) found that the model was most effective for moving students from precontemplation to contemplation with regard to sunbathing avoidance. Finally, a school-based injury prevention program found this model particularly effective for increasing safety behavior changes in students (Kidd et al. 2003).

With respect to hearing protection and NIHL, the majority of the U.S. public might be characterized as being in the precontemplation stage, with many people still not aware of the dangers of exposure to damaging levels of noise. Tailored messages can increase awareness of the prevalence and seriousness of the problem. Some people are probably aware of the risk of exposure to loud sounds, but unaware of what they can do to reduce this risk. Such individuals can benefit from education designed to develop their skills in preventive behaviors. And even though a small number of young people may have reached the action stage, they will continue to need encouragement and support to help them maintain both their skills and motivation to protect their hearing.

Intrapersonal Theories: The Theory of Reasoned Action and the Theory of Planned Behavior

There is substantial evidence that behavioral intentions are highly predictive of future behavior, and therefore it is important to determine what factors influence behavioral intentions. According to the Theory of Reasoned Action advanced by Fishbein & Ajzen (1975), there are three constructs that are fundamental to planned changes to risky behavior (intentions to change): these are (1) the individual's attitude about the behavior, (2) the individual's perceived control over the behavior in question—how easy or difficult it is to change the undesirable behavior (Albarracin et al. 2001), and (3) the subjective norms related to the behavior – perceptions of how others (peers) view the behavior.

This theory suggests that social norms often determine individual attitudes, and strategies for behavioral change must consider the range of relevant social influences. A typical example involves research in which elementary school children were instructed in a sun-safety program (Donovan & Singh 1999). The investigators found that children were opposed to wearing long-sleeved shirts in the sun if they believed that their peers would tease them for that behavior. Other research programs has confirmed the dramatic effects of peer attitudes on the use of hearing protection and on avoidance of noise exposure (Chemak et al. 1996).

Several studies have looked at the effectiveness of older age peers teaching younger peers under the assumption that students closer in age but a few years older are role models and a trusted source of information regarding what is acceptable and even normative (Caron et al. 2004; Stock et al. 2007). One such program, Dangerous Decibels, has demonstrated the influence of older peers in the classroom. In this research study trained older peers were effective at increasing knowledge, changing attitudes and changing behavioral intentions about using hearing protection, in 4th graders (Griest 2008).

Fishbein & Ajzen (1975) also identified the importance of adult attitudes and behaviors in shaping young peoples' actions with respect to risk-avoidance. In the context of hearing conservation, their findings suggest that students receiving training in prevention of hearing loss will be more likely to accept such programs if they believe that their parents, teachers and/or other important adults identify hearing health as a significant issue.

The Theory of Planned Behavior is an extension of the Theory of Reasoned Action. Here the construct of perceived behavioral control is added (National Cancer Institute 2005). Bandura (1977, 1986a) emphasized the importance of beliefs in one's own ability to perform (self-efficacy) and control (perceived behavioral control) desired behaviors. Bandura (1986b) stated, "People tend to avoid tasks and situations they believe exceed their capabilities, but they undertake and perform assuredly activities they judge themselves capable of."

Recent studies have demonstrated the usefulness of these theories in reducing verbal and physical aggression in teens (Meyer et al. 2004), increasing healthy eating among high school students (Tsorbatzoudis 2005; Backman et al. 2002), and increasing consumption of fruits and vegetables in seventh graders (Lien et al. 2002). In addition, Baranowski and colleagues (2003) reviewed seven different models in an effort to identify the best fit to understand the nature of obesity and identified a modified Theory of Planned Behavior as most explanatory.

Research suggests that students who know how to determine when a particular risk-avoidance behavior is appropriate, and who believe they have command of the relevant behavioral skills, are more likely to engage in these behaviors (Bandura 1986a). As an example of this type of approach, a program to increase hearing-protective behavior in rural high school students included substantial practice in correct methods for inserting earplugs. In addition to a formal instructional program about hearing, the students were also trained in the use of sound level meters and encouraged to use them to measure sound levels of noisy equipment on their own farms.

An important adjunct in strengthening young peoples' feelings of self-efficacy involves their communication skills, particularly where interaction with their peers is concerned. Such interactions can be important for establishing links between social norms and desirable risk-avoidance behaviors. Learning how to explain to one's peers the reasons for avoiding risk and for practicing risk-avoidance behaviors can be very important because these behaviors have been found to increase the likelihood that an individual will actually engage in the avoidance behavior. Furthermore, if the individual succeeds in convincing one or more peers about the importance and feasibility of risk avoidance, these communication skills also increase the likelihood that the social norm will be altered. There are various skills needed for effective communication with peers, including behavior modeling and role playing, developing refusal skills and techniques for resisting social pressures, public contract-making and assertiveness training (Devries et al. 1992; Main et al. 1994; Noland et al. 1998; Price et al. 1998).

Intrapersonal Theories: The Health Belief Model

Young people are known to harbor a wide variety of beliefs concerning risks to health, and these beliefs may influence their reactions to programs such as hearing conservation. In the Health Belief Model, Janz & Becker (1984) identified five important factors that may influence an individual's decision to practice a health behavior. First, there are perceived "roadblocks" or barriers to performing the recommended behavior (whether these barriers are physical, mental, or social). Second, there is the individual's perception of potential benefits to be gained from practicing the recommended behavior. Third is the extent to which the individual perceives his or her susceptibility to the risk; and fourth, the extent of potential damage or harm to be incurred if the risk is not avoided. In addition, self-efficacy, or the ability to perform the task involved in the behavior is critical. Finally, individuals will experience a variety of cues to action (such as media messages or school-based health interventions), which can potentially shape their beliefs regarding the need for a behavior change. A review of 46 different health-behavior studies incorporating the Health Belief Model summarized the results in the light of the five factors listed above, and concluded that there is substantial empirical support for the model (Janz & Becker 1984).

The Health Belief Model underscores a number of significant challenges that exist for hearing conservation programs. Experience has shown that concern about their own susceptibility to hearing damage appears to be low in many young people. Equally pervasive are misperceptions about the potential damage to our hearing caused by loud sounds. Further, potential benefit to be gained from the use of hearing-protective devices, or from avoidance of overly loud music or damaging recreational noise, are evident only in the long term and not immediately. There are also extensive barriers in the form of social pressures to accept dangerously loud

recreational noise such as motorcycles, “boom” cars, or amplified music. These factors make it difficult to convince young people that hearing protection is important for their long-term health. In the face of these discouraging observations, the Health Belief Model provides useful guidance by emphasizing those topics that should receive special emphasis in hearing conservation programs aimed at youth. The model supports the specific value of cues to action such as well-crafted media messages alerting adolescents and children to risks of loud sound exposure and to the long-term benefits to be gained from adopting preventive strategies.

The Health Belief Model is rarely studied as an entire model. More often individual constructs are examined separately, such as barriers to change and cues to action (Basen-Engquist 1992). Perhaps most important for hearing conservation programs is the notion that perceived susceptibility is critical for behavior change to occur (Catania et al. 1990). Unlike smoking-related diseases, most young people do not perceive themselves as susceptible to NIHL. For this reason, the Health Belief Model may be applicable to examining hearing protection behavior

Interpersonal Theories: The Social Cognitive Theory

Bandura (1986b) and the Social Cognitive Theory made one of the most influential contributions to the study of health behavior. This theory attempts to predict behavior by measuring the interactions that take place within an individual’s social environment. Bandura argued that behaviors are learned and adapted through social interactions with others and the environment in a reciprocal model in which individuals can understand and anticipate the outcomes of a prescribed behavior. According to this theory, individuals learn by observing, anticipating behavioral outcomes, practicing skills and developing confidence in them. Experiences with behaviors, whether they are positive or negative, will predict whether a behavior will be reinforced or not. In the case of hearing-protective behaviors, Social Cognitive Theory emphasizes the need to identify and deal effectively with existing social pressures that contradict the importance of hearing or denigrate efforts to avoid potentially damaging situations.

The immediate physiological rewards associated with tanning, or use of alcohol or other drugs of abuse is clear, but in addition, there are potent social rewards for young people engaging in behaviors that make them appear “cool” or more adult or more in command of their own choices. As hearing professionals know, wearing hearing protective devices such as ear plugs or ear muffs is seldom viewed as “cool”—except, perhaps, in the context of space exploration or other high-technology activities. However, behavior that is modeled by desirable role models (such as by adolescents who are perceived as leaders) can lead to imitative efforts by those who are somewhat younger or in positions of lower social influence. That fact has led to the use of “peer presenters” to educate school children about various health behavior issues. For example, Black et al. (1998) reviewed over 100 drug-prevention programs designed for middle school children. They found that children were more receptive to sessions led by peer “facilitators” because of the following factors: peer presenters were seen as having more realistic understanding of situations in which drugs might be used; children were more receptive to communications from peer presenters than from teachers or other adults; peer-led educational interactions were in general more comfortable and also more fun for the subjects involved. Similarly, peer facilitators were found to be effective presenters in a program to teach third graders about the dangers of sun exposure and how to achieve skin cancer prevention (Reding et al. 1996).

Recent studies have found success using the Social Cognitive Theory. Health behavior interventions driven by this theory have focused on increasing physical activity in adolescent girls (Garcia et al. 1995; Levers-Landis et al. 2003; Fulkerson et al. 2004; Dishman et al. 2004, 2005) and adolescents in general (Hortz & Petosa 2006). Dietary issues, including those involved with diabetic adolescents have also used the social cognitive theory to develop interventions (Trevino et al. 1998; Baranowski et al. 2000) identify perceptions (Burgess-Champoux et al. 2006) and increase self-efficacy (Rinderknecht & Smith 2004). The usefulness of the Social Cognitive Theory for teaching hearing conservation to adolescents is clear. Using peers or older-age peers to change attitudes and behavior is well documented. This "role model" strategy has the potential to reduce risk taking in both the target audience and those chosen to be older peer leaders.

CONCLUSION

Many other models of behavior change have been described and examined in the literature. These new additions build on the constructs identified in the theories noted above. Noted examples include 1) the Health Promotion Model (Shin et al. 2005) which identifies constructs that describe the benefits and barriers to behavior change called behavior-specific cognitions and affect, 2) social ecology models that incorporate constructs accounting for social and environmental factors in the change setting (Booth 2001), and 3) other models like the Precede-Proceed Model (Green & Kreuter 1999) and RE-AIM (Klesges et al. 2005), which serve important functions for structured planning and evaluation.

New additions to the theoretical landscape are illustrative. They demonstrate that theory building continues to be dynamic and far-reaching. This is in no small measure because the challenge of reducing risks by changing behaviors is vital. This is particularly true in adolescent hearing protection. Earplugs are not cool (at least not yet), and most adolescents do not perceive hearing loss as important. In order to overcome these obstacles, it is incumbent upon hearing conservation programmers to incorporate the knowledge gleaned over many decades by health behavior research.

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