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## Diffusion of preventive innovations<sup>☆</sup>

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### Abstract

The present paper draws on the diffusion of innovations model to derive a series of strategies for speeding up the spread and implementation of new ideas in preventing addiction. Preventive innovations usually require an action at one point in time in order to avoid an unwanted future condition. Hence, preventive innovations diffuse rather slowly, in part due to delayed rewards from adoption. Here we suggest five strategies, based on diffusion theory, for speeding up the diffusion of preventive innovations.

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*Keywords:* Diffusion; Innovation; Prevention; Addiction; Strategies

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### 1. Introduction

Prevention is generally much cheaper than treatment. This statement is certainly true in the field of addictions. Then why do we not devote greater attention and resources to the prevention of addictions? How could we more effectively diffuse and implement new ideas in addiction prevention, both to professional addiction staff and to their clients?

In order to answer this question, we draw on the theory of the diffusion of innovations, a framework that has been applied to various programs in health prevention, including drug addiction (Ferrence, 2001; Martin, Herie, Turner, & Cunningham, 1998).

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## 2. The diffusion model

*Diffusion* is the process through which (1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system (Rogers, 1995). Diffusion is a special type of communication concerned with the spread of messages that are perceived as dealing with new ideas, and necessarily represent a certain degree of uncertainty to an individual or organization. The four main elements in the diffusion of new ideas are (1) innovation, (2) communication channels, (3) time, and (4) the social system.

An *innovation* is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. Why do certain innovations spread more quickly than others? The characteristics of an innovation, as perceived by the members of a social system, determine its rate of adoption. The characteristics that determine an innovation's rate of adoption are: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, and (5) observability.

*Relative advantage* is the degree to which an innovation is perceived as better than the idea it supersedes. It does not matter so much if an innovation has a great deal of objective advantage. What does matter is whether an individual *perceives* the innovation as advantageous. *Compatibility* is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters. *Complexity* is the degree to which an innovation is perceived as difficult to understand and use. *Trialability* is the degree to which an innovation may be experimented with on a limited basis. *Observability* is the degree to which the results of an innovation are visible to others.

Innovations that are perceived by individuals as having *greater* relative advantage, compatibility, trialability, observability, and *less* complexity will be adopted more rapidly than other innovations.

Mass media channels are more effective in creating initial knowledge of innovations, whereas interpersonal channels are more effective in forming and changing attitudes toward a new idea, and thus in influencing the decision to adopt or reject a new idea. Most individuals evaluate an innovation, not on the basis of scientific research by experts, but through the subjective evaluations of near-peers who have already adopted the innovation. Diffusion is essentially a social process through which people talking to people spread an innovation. The *innovation–decision process* is the mental process through which an individual (or other decision-making unit) passes (1) from first *knowledge* of an innovation, (2) to forming an *attitude* toward the innovation, (3) to a *decision* to adopt or reject, (4) to *implementation* of the new idea, and to (5) *confirmation* of this decision.

*Innovativeness* is the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system. Five adopter categories, or classifications of the members of a social system on the basis on their innovativeness, are: (1) innovators, (2) early adopters, (3) early majority, (4) late majority, and (5) laggards. This categorization is based on the percentage of individuals (or organizations) under each portion of the normal curve, marked off by standard deviations from the mean. For example, 2.5% of the members of a system is 2 S.D. before the mean (these are innovators). Most distributions of individuals, on the basis of their time of adoption of an innovation or their innovativeness, have been found to be normal (this evidence is summarized in Rogers, 1995).

*Innovators* are the first 2.5% of the individuals in a system to adopt an innovation. Their interest in new ideas leads them out of a local circle of peer networks and into more cosmopolite social relationships. *Early adopters* are the next 13.5% of the individuals in a system to adopt an innovation. Early adopters are a more integrated part of the local system than are innovators. Whereas innovators are cosmopolites, early adopters are localites. This adopter category, more than any other, has the highest degree of opinion leadership in most systems. Potential adopters look to early adopters for advice and information about an innovation.

Several health interventions identified opinion leaders in a community of medical practitioners or members of the public, and then introduced innovations through these opinion leaders, thus speeding up the diffusion process (Farquahar et al., 1990; Puska et al., 1986). Randomized controlled experiments consistently showed the important role of opinion leaders in the diffusion process. For example, Lomas et al. (1991) evaluated the effectiveness of two strategies for changing medical doctors' behavior regarding a trial of labor and vaginal birth delivery in order to decrease the risk associated with Caesarian delivery: (1) an audit of charts and feedback to the medical doctors versus (2) encouragement from opinion leaders identified among 76 physicians in 16 community hospitals. At the end of 2 years, the audit and feedback made no measurable change in doctors' behavior, but the opinion leader approach led to a 46% increase in adoption of trial of labor and an 85% increase in adoption of vaginal birth delivery.

*Early majority* are the next 34% of the individuals in a system to adopt an innovation. *Late majority* are the next 34% of the individuals in a system to adopt an innovation. *Laggards* are the last 16% of the individuals in a system to adopt an innovation. These later adopters will only accept a new idea when they are surrounded by peers who have already adopted and who are satisfied with the new idea.

### 3. Preventive innovations

*Preventive innovations* are new ideas that require action at one point in time in order to avoid unwanted consequences at some future time (Rogers, 1995). The rewards to the individual from adopting a preventive innovation are often delayed in time, are relatively intangible, and the unwanted consequence may not occur anyway. Thus, preventive innovations are relatively low in relative advantage, compared to nonpreventive innovations. Past research shows that perceived relative advantage is the most important predictor of the rate of adoption of innovations, so here we see one reason why preventive innovations are relatively slow to be adopted. Anything we can do to increase the perceived relative advantage of preventive innovations can increase their rate of adoption (Rogers, 1995).

The record of attempts to introduce drug prevention to younger school children through such health education programs as DARE in the US has been fairly dismal. Evaluation studies of the effects of DARE, such as comparing the later rates of drug use by children taught the DARE curriculum versus equivalent children not taught the DARE curriculum, show that DARE has no lasting effect (Ennett, Tobler, Ringwalt, & Flewelling, 1994; Lyman et al.,

1999; Rogers, 1993). Research on many other preventive innovations shows how difficult their diffusion is, compared to nonpreventive ideas.

#### 4. Strategies for diffusing preventive innovations

What strategies could be used to speed up the diffusion and use of preventive innovations?

1. *Change the perceived attributes of preventive innovations.* As mentioned previously, the relative advantage of a preventive innovation needs to be stressed (Lock & Kaner, 2000).
2. *Utilize champions to promote preventive innovations.* A *champion* is an individual who devotes his/her personal influence to encourage adoption of an innovation. Goodman and Steckler (1989) found that champions for health ideas were often middle-level officials in an organization.
3. *Change the norms of the system regarding preventive innovations through peer support.* Changing norms on prevention is a gradual process over time, but can be accomplished (Kaner, Lock, McAvoy, Heather, & Gilvarry, 1999; Keller & Galanter, 1999).
4. *Use entertainment–education to promote preventive innovations.* *Entertainment–education* is the process of placing educational ideas (such as on prevention) in entertainment messages (Singhal & Rogers, 1999).
5. *Activate peer networks to diffuse preventive innovations.* Previously, we mentioned that diffusion is a social process of people talking about the new idea, giving it meaning for themselves, and then adopting. Anything that can be done to encourage peer communication about a preventive idea, such as training addiction counselors in new addiction treatment techniques, thus encourages adoption (Martin et al., 1998).

#### 5. Discussion

Under ordinary conditions, the diffusion process for an innovation, even one with considerable relative advantage, requires a lengthy time period. Understanding the diffusion process (on the basis of the some 6200 diffusion studies completed to date) can help suggest strategies, such as those above, to speed up the diffusion process. Unfortunately, preventive innovations (like most new ideas in the addiction field) generally diffuse relatively slowly, even when promising diffusion strategies are utilized.

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