1

The community system of alcohol use and alcohol problems

Introduction

Joseph Townsend lives in Great Britain in the large metropolitan area of Birmingham. Concerned about the number of street people in his downtown neighborhood who were regularly intoxicated, Joseph organized his neighbors and many local shops to set up a storefront recovery center where alcohol-dependent people could get counseling and where meetings of self-help groups, e.g., Alcoholics Anonymous, could be held. The storefront recovery center was a big success, with many clients coming and going every day. After the center had been operating successfully for six months, Joseph noticed, during his regular walks through his neighborhood, that the number of people intoxicated on the street had not decreased. In fact, there appeared to be many more now than before. “How could this be,” he wondered, “after all the work we have done?”

In another community, Silver City, a small multi-ethnic town in New Mexico (USA), Mary and Charles Lopez, parents of two children, 15 and 18 years old, were concerned about the amount of drinking by local young people. They were fearful that their daughter and son might drink, and they were concerned about the risk of harm to their children and others in their community as a result of teenage drinking. Other parents joined them in assisting the local schools to adopt a health curriculum that informed young people about the risks of alcohol and other drugs. The school curriculum was widely and effectively implemented, and was popularly received by the community. About a year later, four honor-roll students were killed during a “joy ride” in a family automobile. The 17-year-old driver had a blood alcohol level of 0.15%, well over the legal limit. In covering the tragic deaths, the local paper noted that, according to a recent survey, self-reported alcohol use among high school students was at an all-time high. It also reported that all the young people in the car had been
drinking, and that they had just left a party where a keg of beer was available, permitting unlimited drinking.

In Vancouver, British Columbia (western Canada), scientists were working on a longitudinal research project to determine the characteristics of children most at risk for early alcohol use and subsequent high-volume, dependent use. The scientists developed a set of factors that statistically predicted which children would be most likely to engage in experimental drinking. Such factors as hyperactivity, shyness, loneliness, and family history of problem drinking (possibly suggesting a genetic component to risk) were identified. As a result of their success in isolating these factors, the scientists received much attention from other researchers. Working with the local school district, they obtained federal government funds for a research demonstration project. They used the grant funds to establish and evaluate a program to identify 6- to 8-year-old children at risk, and to counsel their families. Students were assigned randomly to treatment groups, in which children at risk were identified and their families were counseled, and to control groups, which received no intervention. At the end of the ten-year study, drinking rates in the treatment group were lower than would be expected based on published reports of alcohol use in other, similar school populations. However, the control group’s drinking rates also were lower than expected. The scientists published a set of scholarly papers reporting statistically significant differences between the treatment and control groups in such measures as age of initiation and drinking level. However, overall rates of drinking and driving crashes, and alcohol-related violent events among young people in the community were at their highest levels in ten years. The school superintendent, who was an enthusiastic supporter of the early identification and counseling program, wondered what had gone wrong.

In Perth, Australia, a community coalition of concerned citizens received a grant from a private foundation to plan a prevention effort against alcohol and drug abuse. The community had a high rate of alcohol-related problems and illicit drug use, so local leaders were enthusiastic about a community-wide prevention effort. At the end of the one-year planning period, a community-wide coalition of leading civic organizations, religious groups, and businesses had been organized, and the coalition had prepared a well-written plan for a long-term prevention public education campaign. As a result, the foundation gave the community an additional three-year grant to implement the full prevention program. Using foundation funds, the community hired full-time staff, established program offices in a visible location downtown, and invited additional organizations and
Introduction

Community leaders to participate. The program initiated a series of professionally planned media campaigns to inform everyone in the community about the problem of alcohol and drug abuse. Large numbers of brochures and posters were printed, and television and radio time, and newspaper space were purchased. Novel public information techniques were used, such as messages on grocery bags, and on free balloons and candy. Messages warned about the dangers of heavy alcohol use and the community’s intolerance of illicit drug use. People were impressed with the high quality of the media campaign, and it was well received. Families and young people were organized into support groups to assist the campaign. In the second year of the program, the media campaign included a week-long community forum and celebration, complete with alcohol-free events and professional musical entertainment. Media coverage of the coalition and its activities was extensive. The coalition and community support groups against alcohol and drug abuse increased in size. At the end of the program's third year, an outside university research group conducted an independent evaluation of the program. They found high community awareness, support, and participation in the campaign. However, when the researchers compared recently collected outcome data with baseline data collected before the campaign, they found no changes in the rates of alcohol-related problems or self-reported drug use. The community leaders and the foundation were displeased. The foundation refused to release the findings. The community leaders dismissed the results as irrelevant, because everyone in the community was happy with the program.

In communities throughout the world, people are concerned about drinking by young people, drinking and driving, alcohol dependency, drinking at the workplace, and accidental injuries, accidental deaths, and violence resulting from alcohol use. These health, economic, and social problems to which alcohol can significantly contribute are what we refer to in this book as “alcohol-involved problems.” In the stories above, only the names and locations have been changed. These accounts illustrate the difficulties commonly experienced by communities worldwide in their efforts to prevent alcohol-involved problems.

Alcohol abuse has most often been viewed as a problem involving drunks and alcoholics – individuals whose heavy use of alcohol is regular (usually daily) and involves binge drinking and drunkenness. Prevention of alcohol-involved problems most often has focused on individual decision-making or compulsion to drink. However, such approaches to alcohol-abuse prevention fail to take into account many factors surrounding patterns of alcohol use and alcohol-involved problems. In reality, we are
creatures of our cultural and economic environments, which influence us, and which we influence in turn. We are connected to other people, and our actions and reactions cause actions and reactions in others. We can use alcoholic beverages to our own advantage, or disadvantage, or to the disadvantage of those around us. An individual's decision to use alcohol, and the frequency, quantity, and situation of individual alcohol use are the result of a combination of biological and social factors, including physiology, personality, and parental behavior (what one saw as a child). What one's friends and relatives do, and what one believes to be socially expected, as well as such tangible factors as alcohol availability, how much money one has to spend, and the cost of alcoholic beverages are relative to the decision.

This book's thesis is that until prevention efforts cease to focus narrowly on individual alcoholism and begin to adopt broader perspectives on alcohol-involved problems and strategies to reduce them, the experiences described at the start of this chapter will be repeated over and over. Prevention efforts that focus only on alcoholism overlook the general misuse of alcohol and the use of alcoholic beverages in high-risk situations, such as driving or swimming. In addition, efforts that target only individuals ignore the routine social and economic context in which drinking occurs in almost every industrialized society. Drinking is not only a personal choice, but also a matter of custom and social behavior. It is influenced by disposable income, and by the availability and cost of alcoholic beverages. In traditional approaches, the well-intentioned people who introduce prevention programs into communities have rarely considered community settings as adaptive, dynamic systems – complex arrangements with parts that interact and change over time, often in unexpected ways.

The purpose of this book is to challenge the current implicit models used in alcohol problem prevention and to offer a perspective of the community as a complex adaptive system. Appreciating, understanding, and intervening in the community system is the frontier for alcohol problem prevention in the 21st century.

Heritage of the dynamic community system

All ideas have debts to those who established earlier intellectual foundations. The community perspective as a complex adaptive system follows earlier work in community psychology, general systems theory, and community-based prevention in alcohol and other drug abuse.

Community psychologists following the lead of social psychology and
sociologists have for a number of years called for a consideration of the individual within the social environment in designing prevention. Lewin (1947), who introduced the construct of field theory (borrowed from physics) into psychology, laid down the principle of individual and environmental interaction. Sarason (1974) described the community as containing a variety of institutions which are formally and informally related to each other. Seidman (1988) in describing a theory of social interaction for community psychology emphasized ongoing transactions and social relationships between subsystems as well as between-system interactions. Kelly and his colleagues (Kelly et al., 1988; Kelly, 1990) have established principles for conducting prevention research in the community with a focus on community ecology.

The general systems approach to complex organizations (physical sciences, and social and behavioral sciences) defined the principles of self-organization, adaptation, and feedback across intellectual disciplines. See, for example, the description by Mitroff & Sagasti (1973) of general systems theory and complex decision-systems. Churchman (1979) and Ackoff & Emery (1972) described the elements of purposeful systems which use internal structure as well as interaction with the larger environment to survive and adapt.

There exists a long history of community-based prevention efforts for alcohol-involved problems. See reviews by Holder (1992) and Giesbrecht (1993). An example of community prevention efforts designed to alter community structures and not a target group of high-risk individuals is provided by Casswell & Gilmore (1989) in New Zealand, Stout (1992) in Rhode Island, USA, and Holmila (1997) in Finland. The community effort in Ontario, Canada, described by Giesbrecht & Pederson (1991) illustrates a mixed strategy targeting a high-risk drinking group and structural changes.

This book has an intellectual debt to such foundations. However, the concepts to be presented do represent a radical departure from most community-based prevention as practiced throughout the world currently. The complex adaptive systems perspective is not a simple extension of earlier intellectual work as the next chapter will illustrate.

Complexity, chaos, and self-adaptive systems

To understand how the perspective on alcohol-involved problems presented in this book differs from traditional perspectives, it is necessary to understand a bit about traditional Western scientific approaches – in particular,
the differences between reductionist and holistic approaches to science, and between deterministic and probabilistic explanations of phenomena.

Western approaches to science and understanding have 2000-year-old roots in the writings of Aristotle, whose logical rules of reasoning (rules of valid inference) established the framework for systematic and scientific thinking since his time. These logical rules of reasoning include induction, by which we infer general laws from observation of specific events, and deduction, by which we explain specific events as resulting from general laws and initial conditions. The Aristotelian approach to knowledge resulted in the division of natural phenomena into categories, groups, or logical structures. This approach supported a reductionist approach in Western science – analyzing phenomena by dismantling them into smaller and smaller units. In contrast, Eastern cultures have been characterized by more holistic thinking – the idea that the whole cannot be fully understood simply through understanding its parts.

Western science was developed upon the premise that the universe is governed by fundamental laws that humans can discover by a process of reduction. For example, biologists seek to understand life processes by identifying the molecules that make up living organisms and understanding how these molecules behave; physicists seek to understand the nature of the universe by searching for subatomic particles and defining the forces by which these particles interact. Inherent in the reductionist approach to science has been the concept of determinism – the idea that given a particular set of initial conditions, the outcome of an event is predetermined by fundamental laws.

The experimental method of science (often called the “scientific method”) rests upon these traditions. In this approach, scientists use deductive and inductive reasoning to infer the existence of general principles. Then, to test whether a principle is truly general, a scientist uses the principle as the premise of a testable hypothesis – an “if-then” statement whose truth can be tested experimentally. The scientist then designs an experiment in which most independent variables (factors that could affect the outcome) are either physically held constant (as in a laboratory) or statistically controlled (for example, by making sure that two random samples of survey respondents do not differ in some unintended way that might influence their responses). The scientist purposely alters one independent variable and analyzes the effect of this alteration on the outcome of the experiment (i.e., measurements of the dependent variable). Through repeated experiments, the scientist develops generalizable relationships between independent variables and the dependent variable.
Complexity, chaos, and self-adaptive systems

As in other areas of science, biomedical and behavioral scientists studying addictions traditionally have taken a reductionist approach, focusing on the molecular basis of addictions in the individual. As a result, much of the scientific basis for prevention of alcohol-involved problems rests upon a reductionist and deterministic perspective on alcohol use and associated problems. The site of an alcohol problem is believed to be the individual drinker, who consumes alcohol in large quantities, sometimes in a compulsive and dependent fashion, as a result of specific factors that can be isolated and studied separately. Thus, alcohol problems are seen as being caused by “flawed” people – alcoholics, addicts, dependent persons, the poor, persons from broken families, incompletely socialized individuals, and psychologically damaged or genetically disadvantaged persons. Accordingly, the traditional goal of prevention has been to identify individuals who drink excessively or in a compulsive and dependent fashion, and to identify them early enough to prevent a natural progression to more and more destructive drinking.

In recent years, scientists in many fields have come to recognize the important role of chance in the course of natural phenomena. They have come to believe that rather than determining the outcomes of events, natural laws only describe the likelihoods (probabilities) of various possible outcomes. If the probability of one particular outcome is so high that scientists never happen to observe any other outcomes, the principle looks like an absolute law – the outcome appears to be predetermined. As scientists study increasingly complex systems, with many interacting components, the role of chance in affecting the outcome of each interaction becomes more and more important, and the overall behavior of the system becomes less and less predictable. In highly complex systems, such as social or ecological systems, scientists are finding that the principles arrived at through a reductionist approach do not in fact help them successfully predict the overall behavior of the system.

“Chaos” is a term used to express the complex dynamics of natural systems, be they in physics, chemistry, biology, ecology, economics, or social sciences. (For examples of the application of chaos theory in various fields, see Davies, 1989, on physics; Arthur, 1990, on economics; Perelson & Kauffman, 1990, on molecular biology; Nicolis & Prigogine, 1989, and Devaney, 1989, on the theory of complexity; and Axelrod, 1984, on social system adaptation. For a popular introduction to the concept of chaos, see Waldrop, 1992.) Chaotic and random behavior of complex systems is a natural feature of the world, not an exception to deterministic rules. Seemingly small changes in the conditions affecting a natural complex
system (such as social and economic systems) may result in major transformations in the system’s structure and dynamics that could not have been predicted through a reductionist approach. Complex natural systems are by nature adaptive, transformational, and unpredictable.

This new paradigm has stimulated renewed interest in the study of complex adaptive systems – systems that respond to external and internal conditions and forces by evolving and transforming themselves over time. (For discussion of the concept of the complex adaptive system, see Holland, 1975; Kauffman, 1991, 1993, 1995; Casti, 1992, 1994; and Stonier & Yu, 1994.) Adaptation refers to a system’s inherent ability to accommodate to changes or disturbances, arising from within the system or from the external environment. Clearly, adaptation is a fundamental attribute of all living organisms, as well as the social structures in which human beings live.

This book proposes an approach to prevention of alcohol-involved problems from a systems dynamics perspective, in which the community is studied and understood as a complex adaptive system. Several key terms are useful in describing the community as a complex adaptive system. Dynamic refers to the inherent nature of communities to change over time: a dynamic system never stands still. Complexity means that multiple elements, levels, interactions, and subsystems are continually operating within the community. This complexity gives rise to the community’s ability to adapt. Adaptation refers to the transformational nature of communities – their ability to adjust to both internal and external forces. The community is continually adjusting to new conditions and input, and it is capable of evolving into new and unpredictable structural arrangements. Because the community is a complex adaptive system, mechanistic and deterministic approaches to social and economic systems are inadequate to explain and predict the occurrence of alcohol-involved problems in the community. At worst, mechanistic and deterministic approaches are misleading and potentially destructive.

A new paradigm for prevention

A new paradigm for prevention of alcohol-involved problems is needed now and for the 21st century. The following propositions are a useful starting point:

- Alcohol (and other drug) problems are the natural result (output) of dynamic, complex, and adaptive systems called “communities.”
- Working only with high-risk individuals or small groups produces, at best, short-term reductions in alcohol problems, because the system
A new paradigm for prevention

will produce replacements for individuals who leave high-risk status, and the system will adapt to changes in the composition and behavior of subgroups and populations.

- Interventions in complex adaptive systems do not always yield the desired results, and they often produce undesired and unexpected outcomes that are counterintuitive (“not what we thought would happen”).

- The most effective prevention strategies are those that seek to alter the system that produces alcohol problems.

- Prevention strategies historically have been “single solutions”; that is, they have attempted to accomplish a goal by one (usually massive) program or strategy, rather than by concurrent, mutually reinforcing approaches.

- Without an understanding of the community as a dynamic system – that is, without a model that increases our ability to understand and effectively change the system – it is unlikely that effective long-term prevention of alcohol problems will occur in practice.

Simply adding the word “community” to our prevention vocabulary is insufficient to accomplish the needed paradigm shift. In particular, scientists and practitioners in alcohol problem prevention must recognize that open, dynamic community systems adapt and adjust to their interventions, making lasting change difficult to achieve. Likewise, simply drawing boxes and arrows does not make a system. The community “system” is popularly illustrated by lines that connect “everything to everything.” Such “system” drawings represent our ignorance and naïveté, not our appreciation and understanding.

Without an understanding of the dynamic, adaptive nature of the community system, one might develop explanations for the apparently stable oscillation of community alcohol consumption around a naturally occurring level. However, when consumption diverges from this level and establishes a new, different level, understanding is foiled. Over the short term, the natural oscillation appears to represent a stable, unchanging system. But either exogenous factors (from outside the system) or unpredictable (probabilistic) natural forces from within transform the system, and a new consumption level is established. It is the potential for such adaptive transformations that best characterizes community systems of alcohol use and alcohol problems.

Complex adaptive systems can never be fully understood by dismantling them into their basic components: the whole is greater than the sum of its
parts. Scientific knowledge about alcohol use and alcohol problems, accumulated in piecemeal fashion, is fragmented. We understand alcohol problems and processes in isolation, but our knowledge of the larger picture is more limited. The community system is best understood as a whole composed of a set of interacting parts or subsystems. Each subsystem has its own organizing processes that influence, and in turn are influenced by, other subsystems. The entire system is organized at yet a higher level that transcends the organizing process of any one subsystem.

A systems perspective on alcohol-involved problems at the community level can assist researchers and help policy-makers at local and national levels, including legislative staff, elected officials, social and health workers, and prevention program specialists, to design effective local strategies for prevention of alcohol-involved problems. A national perspective cannot effectively guide interventions at the local level. To develop effective community-level prevention, policy-makers must understand how each of the community’s subsystems influences alcohol use and thus contributes to alcohol-involved problems.

The catchment-area approach

Increasingly popular worldwide are community-based approaches to problem prevention that are best characterized as “catchment-area approaches.” From the catchment-area perspective, a “community” is viewed as a set or sets of persons with adverse behaviors or associated risks with respect to the target problem, and the prevention effort is intended to reduce or eliminate these behaviors or risks. The model is straightforward: find the persons at risk (or identify the risk factors that individuals may possess), then educate, treat, or serve them to reduce the individual risk to each person so identified.

An example of a catchment approach might be prevention of cirrhosis mortality in a neighborhood with a transient, low-income population. The city or a local service organization would target this neighborhood and seek to reduce the drinking levels of identified chronic heavy drinkers by establishing a recovery center. In another example of a catchment-area approach, use of alcohol among students of a local middle school might be targeted and approached through strategies aimed at increasing the skills of pre-adolescents for resisting peer pressure to drink, developing alternative after-school activities, and implementing school-based and family-focused alcohol education programs. This approach ignores the role of retail sales of alcohol to young people, and its prevention activities gen-