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AGRICULTURAL PSYCHOLOGY

In contrast to other social sciences that have developed specialized subdisciplines and/or application interests in agriculture, psychology historically has not been known for its concern with rural issues. For instance, there has not been any psychological counterpart to such social science specialties as agricultural economics, rural sociology, agricultural marketing, or rural geography. Nonetheless, psychological perspectives have interacted with agricultural issues in several domains: (1) assessment of the therapeutic needs of rural populations, (2) investigation of farming tasks and skills, (3) analysis of expert agricultural judges, (4) evaluation of farm management decisions, and (5) statistics and experimental design.

THERAPEUTIC NEEDS

Rural life is often portrayed in an idyllic “down to earth” fashion. Rural communities are assumed to be less stressful and more humane than urban life. However, epidemiological studies have shown serious mental health problems exist in rural communities (Henggeler, 1983). In fact, Husaini, Neff, and Stone (1979) found that many interpersonal problems have higher rates of incidence in rural areas. Despite the need, rural communities often lack many of the mental health services taken for granted in cities. Hoagland (1978) reported that only 17.5% of rural poverty areas had adequate mental health services (compared to 49% of urban poverty areas).

One major reason for this lack of mental health services is that most clinicians and counselors are trained in large urban universities. Faculty (and students) are thus unfamiliar with the values, concerns, and even the language of rural living. Consequently, specialized programs have evolved to prepare mental health-care providers with the skills and abilities to cope with problems encountered in rural communities. For example, Heyman (1983) described a model for preparing community psychologists to work in rural regions of the country. Similarly, Edgerton (1983) considers some ingenious methods that mental health professionals have used to cope with the limitations of providing services in rural contexts, e.g., traveling clinics and in-school centers.

One issue that has received much attention in studies of rural communities has been child abuse. Such abuse involves a pathological interaction between the child, the caregiver, and the situation. Rural environments are different in many respects from the more widely understood urban environment. It should not be surprising, therefore, to find that rural child abuse is perceived in a different light and frequently goes unreported. Nonetheless, home-based early intervention programs are successful in helping “at risk” children in rural areas (Rosenberg & Reppucci, 1983).

FARMING TASKS AND SKILLS

Traditionally, farmers and ranchers were expected to be proficient in many manual and physical tasks. Work psychologists have been involved in examining these skills, e.g., Tomlinson (1970) found that dairy workers must be proficient in nine separate tasks, ranging from operating milking machines to evaluating the health of cows. Thus, a traditional farmer or rancher needed to be a jack-of-all-trades, with general skills in many areas.

However, with the increased mechanization and computerization in agriculture, there has been a shift in the skills needed. Instead of many general abilities, more specialized skills are necessary now. Moreover, instead of emphasizing manual skills, modern agribusiness places greater demand on cognitive abilities. For example, Matthews (1978) reported that handling a modern combine harvester involves simultaneous monitoring and control of at least seven tasks. Given the complexity of the cognitive demands, there has been considerable concern over the human factors component in increasingly high rate of farm accidents (Mainzer, 1966).

With the trend away from small family farms to large corporate farming, there is a greater need for farmers with problem solving and management skills (Stevens, 1970). This has produced changes in both the education and the practice of today's farmers. As a result, behavioral investigators have turned their interests toward analysis of higher thought processes (Shanteau, 1992).

AGRICULTURAL EXPERTISE

Many early insights into the psychology of expertise arose from studies of agricultural workers. For instance, one of the earliest known studies of experts in any domain was conducted in 1917 by Hughes. His data revealed that corn rated highest by expert corn judges did not produce the highest yield. In 1923, Wallace (later vice-president under Franklin Roosevelt) reanalyzed Hughes' data using path analysis. He showed (1) corn judges largely agreed with each other, but (2) their ratings correlated only slightly with crop yields.

Trumbo, Adams, Milner, and Schipper (1962) asked licensed grain inspectors to judge samples of wheat. Nearly one-third of the samples were misgraded and, when graded a second time, over one-third were given a different grade. Also, increased experience made judges more confident, but not necessarily more accurate. Finally, more experienced judges tended to overgrade the wheat samples (perhaps the original form of "grade inflation").

One source of errors in agricultural judgment is the presence of irrelevant factors. Gaeth and Shanteau (1984) noted that nondiagnostic material (e.g., excessive moisture) significantly impacted the decisions of soil judges. They also found that cognitive training was successful in compensating for the presence of these irrelevant materials. Another approach to improving expert judgment was observed in weather forecasting. Murphy and Winkler (1977) found that precipitation forecasts could be improved using a feedback system based on Brier scores (a quadratic scoring system). Since then, accuracy of weather forecasts has increased dramatically (Stewart, et al., 1997).

FARM MANAGEMENT DECISIONS

There have been frequent analyses of the choices needed to manage a farm. Most of this work has been concerned with how economic decisions should be made. There has been concern recently in helping farmers cope with cognitive limitations when they make choices. Rajala and Sage (1979) considered various methods intended to help farmers think more effectively about their decisions. For instance, farmers consistently make suboptimal allocations when buying crop or drought insurance (Anderson, 1974). However, Kunreuther (1979) found that farmers could be persuaded to think more effectively about buying insurance, e.g., by taking a longer time perspective.

Insights into marketing and consumer behavior have come from studies in agriculture. For in-

stance, the pioneering analysis of new-product diffusion by Rogers (1962) was based on farmers' willingness to adopt new agricultural equipment. His classification of individuals into 'innovators, early adopters, early majority, late majority, and laggards' is now widely accepted.

STATISTICS AND EXPERIMENTAL DESIGN

One area where there has been a long-standing interface between psychology and agriculture has been in the development of statistical analysis and research design. A century ago, psychologists such as Galton were instrumental in building the basis of modern statistical thinking (Gigerenzer, et al, 1989). Through such seminal efforts, later psychologists (e.g., Cattell and Thurstone) built the foundation for application of statistics to behavioral research.

Parallel to this effort, statisticians working in agricultural settings (such as Fisher) developed much of what is now considered standard experimental design and analysis. According to Brown (1972), concepts of random assignment and factorial designs initially were proposed to advance agricultural science. Indeed, many terms commonly used today in statistics, e.g., "split plot designs," reflect an agricultural background.

In summary, although "agricultural psychology" is not normally recognized as a subfield of psychology, there have been many applications of behavioral ideas in agricultural settings. Moreover, agricultural issues have impacted psychology in a variety of often unappreciated ways.

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