Part I

Design and Implementation

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Matching alcoholism treatment to client heterogeneity: the genesis of Project MATCH

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Clinical trials are a special form of scientific research designed to test causal hypotheses about the efficacy of a particular treatment for a specific condition. By the late 1980s, clinical trials of alcoholism treatment had advanced to the point where new hypotheses had arisen about the efficacy of matching specific treatments to particular types of alcoholics. This chapter describes the origins of the matching hypothesis in alcoholism treatment research and the genesis of Project MATCH, one of the largest clinical trials of alcoholism treatment ever undertaken. It reviews definitions and forms of matching as well as previous matching studies.

The idea of matching highly specific therapeutic interventions to the unique characteristics of each alcoholic is not a recent phenomenon. In the late nineteenth century the practice of homeopathic medicine was applied to alcoholism according to the principle of *similia similibus curantur*, or patients are best treated with agents that are similar to their symptoms. Using a crude typology of alcoholism that has some resemblance to contemporary classification theories, Dr Gallavardin, a French physician, argued that there are two kinds of 'drunkenness,' which require quite different treatments. The first, acquired drunkenness, was considered the easier to cure by means of a few 'remedies' clearly indicated in each individual. In order to cure the second form of alcoholism, hereditary drunkenness, the author suggested preventive interventions '. . . before the tendency to drunkenness has manifested itself,' by administering, for several years, no fewer than 13 remedies, including arsenic, opium, and petroleum (Gallavardin, 1890, pp. 44–5). In addition to the careful dosing of pharmacological agents, the physician was cautioned to use a motivational approach that begins with the following advice: 'No reproaches should be addressed to the person under treatment, even though he might

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deserve them richly, and in conversation no allusion should be made to his vices or failings' (Gallavardin, 1890, p. 71). For more than 150 years, alcoholism has been treated by a wide variety of pharmacological and psychological interventions (White, 1998), many of which have been designed, like Dr Gallavardin's homeopathic remedies, for specific types of alcoholics. However, it was not until the 1980s that the matching hypothesis was formulated with sufficient conceptual rigor to permit a scientific test of its validity. This chapter describes the genesis of the matching hypothesis and of Project MATCH, the most ambitious attempt to date to test its scientific validity and clinical relevance.

For most of the twentieth century, the matching of therapeutic interventions to the needs of the patient was impeded by the lack of a commonly accepted way to classify alcoholics into distinct groups, and by the lack of a systematic theory that would suggest how types of alcoholics could be matched to the most appropriate treatment (Babor & Lauerman, 1986). By the late 1970s, there was a general impression in the public mind, as well as in professional circles in the USA, that alcoholism was a treatable disease, in part because of the optimistic message of Alcoholics Anonymous, and in part because of the rapid expansion of professional treatment programs. A strong constituency was formed around the loosely assembled system of treatment programs that had emerged through the rapid increase in public and private reimbursement for alcoholism treatment. That constituency tended to interpret the growing research literature as favorable to the idea that treatment is effective, whereas a small number of critics expressed doubts about treatment in general, and about the limited support for specific treatment interventions in particular (Emrick & Hansen, 1983; Miller & Hester, 1986a). Out of this debate emerged a third perspective, that of treatment matching. This view is summarized most clearly in the US Institute of Medicine's 1990 report on alcoholism treatment:

There is no single treatment approach that is effective for all persons with alcohol problems. A number of treatment methods show promise in particular groups. Reason for optimism in the treatment of alcohol problems lies in the range of promising alternatives that are available, *each of which may be optimal for different types of individuals* (Institute of Medicine, 1990, p. 147).

During the 1970s and 1980s, accumulating evidence raised the possibility of significantly improving treatment outcomes by assigning alcoholics to types and levels of care specific to their needs and characteristics (Mattson & Allen, 1991; Mattson et al., 1994; Allen & Kadden, 1995). Although a number of alcoholism treatment approaches had shown

benefit, no specific type of intervention had been demonstrated to be consistently and definitively superior (Hester & Miller, 1989).

Miller (1989b) speculated that, in at least some instances, treatment failure might indicate that the right treatment approach was not utilized and that client–treatment matching would perhaps both avoid unnecessary therapeutic failures and increase cost-effectiveness. Under such a scenario, rather than competing with one another for *all* alcoholic clients, treatment programs and therapists would instead seek the type of clients for whom their approach was most effective. Without doubt, implementation of this advice would require a substantial knowledge base regarding client attributes that influence treatment effectiveness. In addition, various aspects of treatment such as modality, intensity, duration, format, setting, goal, and therapist characteristics would have to be considered in making decisions about treatment matching (Miller & Cooney, 1994). Finally, a systematic strategy for matching individuals to available treatments would need to be developed.

The genesis of Project MATCH can only be understood in the context of these issues. To describe the rationale behind the initiation of Project MATCH, it is first necessary to discuss recent developments in definitions of matching, matching strategies, stages of matching, and predictors of treatment outcome.

Definitions and forms of matching

Alcoholism is a term with many definitions and even more meanings (Jellinek, 1960). It generally refers to a chronic condition characterized by impaired control over drinking, increased tolerance to the effects of alcohol, a physical withdrawal state (when alcohol consumption is stopped or reduced), and a learned preference for alcohol over almost every other rewarding activity in a person's life. The term alcoholism is used synonymously in this book with the more formal psychiatric disorder, called the alcohol dependence syndrome (American Psychiatric Association, 1987). Despite the common clinical features shared by persons who have developed alcohol dependence, alcoholics differ among themselves in many ways. Some of these differences have little to do with alcohol: age, motivation, spirituality, personality, and cognitive style. Other differences distinguish alcoholics in terms of alcohol-related features, such as severity of alcohol involvement and early versus late onset of alcohol dependence. It is this heterogeneity among alcoholics that makes treatment matching a

particularly exciting approach to the development of more effective clinical services. The matching hypothesis predicts that alcoholics who are appropriately matched to treatments will show better outcomes than those who are unmatched or mismatched (Glaser, 1980; Finney & Moos, 1986; Lindström, 1992). As discussed in more detail in Chapter 6, a number of specific matching effects can be predicted on the basis of what has been found in previous research on alcoholics (Longabaugh et al., 1994b).

According to Glaser and Skinner (1981), matching is above all a practical approach, defined as '. . . the deliberate and consistent attempt to select a specific candidate for a specific method of intervention in order to achieve specific goals' (p. 302). This definition implies that matching requires the specification of different types of clients who are most appropriate for different types of treatment in order to achieve different kinds of treatment goals.

A distinction should be made between *predictors* of positive outcome regardless of the type of treatment employed, and *client matching factors* that exert differential effects depending on the type of treatment delivered. Figure 1.1 displays three types of results that may arise from a study contrasting two treatments, one 'gender focused' (i.e., designed to meet the special needs of women) and one 'generic' (i.e., designed to apply to both men and women equally well).

The upper panel in Figure 1.1 shows the effect of an outcome predictor (gender) which does not produce a matching effect. The outcomes are better for females regardless of the therapy they receive. The middle panel illustrates one way that ordinal matching may occur. An ordinal interaction is indicated when nonparallel regression lines do not intersect within the research range of interest. Here, females benefit more from gender-specific treatment than from the generic therapy, whereas males experience approximately equal levels of success in both types of treatment.

Disordinal matching is observed when the treatment outcomes reverse between clients having low levels versus high levels of the characteristic under study (lower panel of Fig. 1.1). In the illustration, gender-focused treatment is beneficial for females but not for males, whereas generic treatment is more beneficial for males than for females.

In general, disordinal matching effects are the most interesting from both theoretical and practical perspectives. The discovery of disordinal matching effects between distinct treatments and different types or levels of client characteristics is considered strong evidence for a theory of differential treatment response. Moreover, such findings could have tremendous
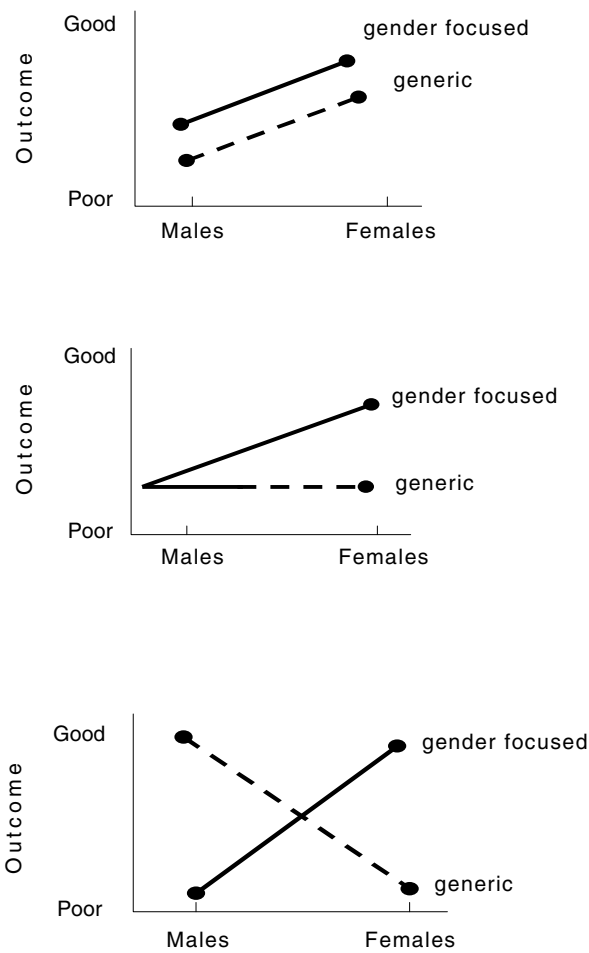
Figure 1.1 Illustration of hypothetical matching effects of gender-focused versus generic treatment with male and female alcoholic clients (adapted from Longabaugh et al., 1994b).

practical significance, suggesting which clients to assign to the specific treatment modalities for maximum benefit.

Matching strategies

For years, practicing clinicians in alcoholism treatment have engaged in several forms of client–treatment matching. Clients are often triaged to

different settings, durations, and intensities of care, for example according to their need for detoxification, the severity of dependence on other drugs in addition to alcohol, and diagnoses of concurrent anxiety, depression, or other psychiatric disorders. In some instances, the problems are severe and therefore the clinical decisions are obvious. However, in the case of less severe or more subtle problems, treatment decisions are more difficult and, in current practice, depend largely on the clinical judgment and theoretical perspective of the decision maker. Lindström (1992) has recommended that treatment selection be based both on practitioners' clinical assessments and on data from standardized diagnostic instruments. Based on clinical practice and theoretical considerations, at least six strategies have been suggested in the investigation of client–treatment matching (Institute of Medicine, 1989).

1. *Reliance on clinical judgment*. Clinical judgment is perhaps the most typical strategy for treatment matching, although it has received virtually no research attention. Clients are typically referred to treatment by doctors, social service agencies or, more recently in the USA, by managed care programs. Some individuals are presented with a limited range of options because of treatment mandates from the legal system. Because the referral process is often arbitrary, and little is known about clinician decision making when it enters into this process, systematic research on this strategy could have practical value.
2. *Self-selection or the 'cafeteria' approach.* This strategy, first proposed by Ewing (1977), relies on the client to select the most appropriate treatment from a range of options. It is assumed that clients will select the form of treatment that is most compatible with their medical needs, personal preferences, and financial resources. With the development of assessment centers charged with the use of standard patient placement criteria, the cafeteria approach could be contrasted with other referral methods to determine whether self-matching provides better outcomes and greater satisfaction with treatment.
3. *Matching guided by exploratory data analysis.* In this type of 'feedback design' (Institute of Medicine, 1989), treatment assignment procedures are studied within an existing network of programs to identify the assumptions behind the matching strategies that are employed and their impact on outcomes. After evaluating the relative outcomes with matched and unmatched or mismatched clients, changes are made to

improve the treatment system. The effects of these changes on outcomes can then be evaluated.

4. *Matching guided by theoretically derived hypotheses.* This strategy relies on the cumulative evidence of research to suggest the kinds of treatments most likely to produce favorable outcomes with different types of clients. An example is the assignment of clients with antisocial personality disorder to cognitive–behavioral treatment, based on the assumption (e.g., Kadden et al., 1989) that these patients have a need for consistency and structure and therefore will have better outcomes with this kind of therapy. This is the approach ultimately chosen by Project MATCH, in part because it showed promise to advance basic knowledge about treatment, and in part because it lends itself to rigorous methodological evaluation.

5. *Matching according to professional guidelines.* In response to concerns about the inappropriate use of expensive residential treatment, 'patient placement criteria' have been developed for adults (Gartner & Mee-Lee, 1995) and adolescents (Babor et al., 1991) to standardize the way in which clients are assigned to different types and intensities of care. For example, criteria proposed by the American Society of Addiction Medicine (1991) specify the conditions under which clients should be matched to outpatient, intensive outpatient, partial hospital, and inpatient treatment. The decision to refer the client to a particular level of care is based on such considerations as acute intoxication, withdrawal symptoms, medical conditions, psychiatric problems, acceptance of treatment, relapse potential, and recovery environment. This kind of matching strategy is primarily a practical guide to the choice of an appropriate treatment setting. Because settings differ in the quality and content of the treatment they deliver, the study of matching to levels of care and treatment settings is unlikely to produce useful information about the efficacy or the underlying processes of treatment matching.

6. *Stepped-care approaches.* Another approach to matching is based on the notion that clients should initially be assigned to the least intensive level of care that is appropriate, and then 'stepped up' to more intensive treatment settings if they do not respond (Institute of Medicine, 1990). In this way, information regarding the most appropriate matches for various types of clients is developed empirically, based on accumulating clinical experience. To date, this approach has not been thoroughly evaluated.

Although each of these approaches is worthy of investigation, previous research has suggested that hypothesis-driven studies using controlled experimental designs are not only the most appropriate initial approach for the identification of matching effects, but also the best way to identify causal mechanisms (Skinner, 1981).

Stages of matching

Ideally, the process of matching should involve comprehensive assessment, negotiation of treatment goals, selection of an appropriate level of treatment, choice of an intervention, arrangements for the maintenance of treatment gains, and follow-up assessment.

An Institute of Medicine committee (1989) identified four areas that represent these different stages in the continuum of care. These stages are important to consider in any attempt to evaluate the efficacy of client–treatment matching.

1. *Matching before treatment starts.* As noted above, the selection of treatment for a particular client may occur in a variety of ways. Although little research has been conducted on this topic, it is likely that program marketing, informal referral networks, and geographic proximity are important determinants. More recently, matching to providers and settings has increasingly been brought under the control of managed care companies. A considerable degree of matching seems to occur before treatment is initiated as a result of program specialization, i.e., the tailoring of programs to suit the assumed needs of such population groups as adolescents, women, war veterans, gay men and lesbians, the homeless and people arrested for driving under the influence of alcohol.

2. *Matching at the initiation of treatment*. As suggested by the American Society of Addiction Medicine Patient Placement Criteria (American Society of Addiction Medicine, 1991), there are a number of different levels and intensities of care to which clients could be matched, based on their needs and characteristics at the initiation of treatment. Ranging from brief interventions to medically managed intensive inpatient care, matching at this stage is usually related to the intensity of care and is closely linked to specific settings, such as outpatient clinics and residential rehabilitation centers.

3. *Matching during the treatment process.* Although many programs claim