Conceptual Level Matching in Therapy: A Review

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It is a common observation that certain kinds of patient-therapy (therapist) pairings are more beneficial than others. Attempts to find out why, through interactional research on therapy, have proven to be difficult. It is often suggested that one reason for this is the absence of an adequate theoretical framework within which such research can be conducted. However, in recent years, one theory, conceptual systems theory (CST), a cognitive personality theory, has developed to the stage where it appears to offer some promise in this regard. This article offers an evaluative review of the empirical studies, with relevance to therapy, which use CST as a basis for interactional research; an analysis of the conceptual and methodological problems inherent in its use; and a discussion of the implication of findings for therapeutic practice.

The selective matching of clients with particular kinds of therapy or therapist, as a route to increased therapy effectiveness, has many advocates (cf. Goldstein & Stein, 1976; Kiesler, 1971; Paul, 1967; Strupp, 1978). This interest has stimulated a sizeable body of research reflecting a wide range of conceptual frameworks within which the components of matching, i.e., client, therapist, and therapy, have been formulated. Several overviews of this research on matching in therapy are available (Berzins, 1977; Parloff, Waskow, & Wolfe, 1978). However, there is a lack of more in-depth reviews providing a critical evaluation of research generated within a single theoretical perspective. In an attempt to redress this situation, the purpose of this review is to evaluate matching research carried out within a particular theoretical framework: that of conceptual systems theory (CST), a cognitive personality theory originally formulated by Harvey, Hunt, and Schroder (1961). Recent discussions of CST are available in Miller (1978) and Goldstein and Blackman (1978).

There are several reasons for focusing on matching research within CST. First, the theory itself is of interest because it facilitates research on matching by being explicitly couched in interactional terms. Unlike trait theories of personality, CST views behavior as being an equal function of person and environment characteristics. Second, CST has shown promise in generating prescriptions for matching in educational settings (Miller, 1981). Finally, there now exists a sufficient body of research within CST relevant to matching in therapy to warrant a collective review.

The review is organized as follows: first, the main features of CST are presented indicating how the components of the therapy situation (i.e., client, therapy/therapist) are conceptualized and operationalized; next, results of studies bearing on

matching in therapy are critically evaluated; and finally, implications of the findings for research and clinical practice are discussed.

CONCEPTUAL SYSTEMS THEORY

CST is a personality theory that focuses on individual differences in social cognition within a developmental framework. It offers a stage-sequence account of cognitive change analogous to those of Kohlberg (1969), Loevinger (1976), and Selman (1976). Since much of the work stimulated by the theory has been carried out in an interactional mode, it is useful, in reviewing the theory, to discuss each component separately before going on to present matching predictions stemming from the theory.

Person

In CST, the person is characterized in terms of the structure and content of cognition, the whole being referred to as a conceptual system. The term 'structure' refers to *how* a person perceives and thinks, the formal aspects of the conceptual system concerning the composition and arrangement of cognitive units into an organized and complex whole. Cognitive structure is the result of, and can be described in terms of, the processes of differentiation and integration. Differentiation involves the articulation of meaning through the production of new conceptual units, whereas integration implies the organization and rearrangement of such units into new conceptual groupings. It is common to assume that low levels of both differentiation and integration result in cognitive simplicity and that high levels of both indicate relative cognitive complexity. However, the precise nature of the relationship between differentiation and integration remains controversial (Miller & Wilson, 1979).

The content of conceptual systems refers to the kinds of meanings developed and the information considered salient by the individual. The central theme used to depict the content of conceptual systems is that of a dependence-independence conflict. Basically, a developmental shift is said to occur from an external, dependent posture to a more internal, interdependent orientation. During this process, the individual is said to move from a conception of social rules as absolutes, and as mandatory guidelines for behavior to a more complex understanding of their nature and function. As a result, the more interdependent the person, the more s/he is said to be capable of autonomy in interpersonal relations.

An important theoretical point is the formal relationship proposed between structure and content, resulting in a developmental dimension depicted as a "concrete-abstract" continuum, referred to as conceptual level (CL) by Hunt (1975). It is assumed, with some empirical support (Miller, 1978), that particular structures are linked to only a limited range of contents. Individuals at the concrete end of the continuum (low CL) show conceptual simplicity (structure) and external, dependent orientations to interpersonal affairs (content). More abstract or high CL individuals are said to exhibit conceptual complexity and internal interdependent orientations.

The measurement of CL follows closely the theoretical formulations in CST and,

as such, reflects both its strengths and weaknesses. A central assumption in CST is that conflict resolution is at the root of conceptual development. Thus, differences in conflict resolution strategies, such as ignoring one side of the conflict (low CL) or attempting to resolve the contradiction by using a superordinate construction (high CL), form the basis of estimates of CL.

Two forms of sentence completion tests are commonly used to assess CL: the Paragraph Completion Test (PCT) Schroder, Drive, & Streufert, 1967; Schroder & Phares, 1974) and the Paragraph Completion Method (PCM) (Hunt, Butler, Noy, & Rosser, 1978). Both procedures emphasize structural criteria in scoring, although content plays a significant role in placing subjects at different levels, and the tests are virtually interchangeable. A variety of more content-based tests are also available in CST, such as the "This I believe" test (TIB) (Harvey, 1973, note 2) and Interpersonal Topical Inventory (ITI) (Tuckman, 1966). However, the two sets of tests, structure vs. content-biased, do not intercorrelate to a significant degree (Miller, 1978), a finding that is of considerable embarrassment to the theory. The PCM is most commonly used in the studies reviewed later. Test-retest reliability for the PCM over a one-year period ranges from .45 to .56 and for a three-month period is .67 (Hunt et al., 1978). As one reviewer of this work notes, these reliabilities are rather poor for a supposed stable feature of cognitive organization and compare unfavorably with other questionnaire measures of personality. As for the validity of the PCM and other measures, Gardiner and Schroder (1972) claim that this has been demonstrated in over 100 studies, a conclusion that receives some support from Miller (1978).

Environment

An interesting feature of CST lies in its attempt to offer a conceptualization of the environment in terms compatible with the person component. A compatible description of the environment would require some discussion of its structure (complexity) and content (beliefs).

The original formulation of the environment by Harvey et al. (1961) has changed little in the intervening years (Goldstein & Blackman, 1978), and is less articulated than that for the person, with only general guidelines being provided. Reflecting its developmental orientation, the primary environmental dimension outlined is that of "unilateral-interdependent," a distinction that contrasts situations in which a child is rigidly controlled by parents or teachers with environments in which a child learns acceptable behavior within a cooperative, exploratory context. The dimension appears to refer to the degree of choice made available to the child. In research on therapy, adoption of this dimension as a basis for distinguishing therapies has led to their characterization in terms of the degree of "structure" provided. In this way of defining the environment the implication seems to be that high control-structure results in a relatively simple (low complexity) environment, whereas low control-structure presents the client with ambiguity, resulting in a more complex environment.

In practice, a common way of characterizing the level of structure in therapy en-

vironments has been in terms of therapist role or style in relating to the client. Thus, high structure forms of therapy are said to be ones in which the therapist takes an active, directive role, controlling and organizing topics to be discussed with the client. In contrast, a low-structure therapist style would involve a more flexible, less directive approach in which client input on topics under discussion is encouraged and responsibility for determining the focus of therapy is shared between client and therapist.

Some investigators have focused on the way in which the content of client-therapist communications is organized during therapy sessions as a basis for defining structure (e.g., Bachman, 1977; Lamb, 1978). Following the distinction made in education between didactic (high structure) and discovery (low structure) teaching methods, therapy structure has been conceptualized in terms of the type of reasoning implied in the client-therapist communication process. In this approach, high-structure forms of communication are those in which therapists present clients with rules from which specific examples are deduced (rule-example sequence). Low-structure forms of communication, on the other hand, involve a more inductive reasoning process where clients derive conclusions or rules from a discussion of specific examples drawn from their own experience (example-rule sequence).

While some degree of success in CST has been achieved in conceptualizing person and environment in compatible terms, currently no standard measurement procedures are available for estimating the "structure" of therapy environments. In practice, investigators have devised a variety of rating scales to serve as post hoc checks on structure differences between therapies. Studies using some form of measurement of therapy structure have reported client ratings to be consistent with ratings of independent judges and also in line with structure differences intended by researchers (e.g., Bachman, 1977; Berg & Stone, 1980; Brill, 1978; Lamb, 1978). In the absence of more sophisticated measures of structure, such measures provide some support for the validity of distinguishing among therapies in terms of their structure.

Person × Environment Matching

The conceptualization of matching, in terms of intent and consequences, is well developed in CST. In its simplest form, matching follows Hunt's (1971) hypothesis that "low CL learners profit more from high structure and high CL learners profit more from low structure, or in some cases, are less affected by variation in structure." This type of matching, termed "contemporaneous" by Hunt, is one that pairs the person with a set of environmental demands with which the person is able to cope using currently available concepts and strategies. Thus, in relation to therapy, a contemporaneous match would involve the pairing of a patient with a comfortable, manageable regime. Hunt also recognizes a "developmental" match, the intent of which is to enhance CL by facing the person with a more demanding (i.e., less structured) environment, one that requires conceptual work if it is to be mastered. The crucial element in this form of matching is to pair the person with a treatment

structure slightly below the level of comfort, a difficult task given the relatively crude methods for determining environmental structure. Apart from the practical difficulties inherent in establishing a developmental match, specific therapeutic purposes that would be served in setting up this type of match are unclear, unless the goals of therapy focus on modifying client CL. In any case, since none of the studies reviewed stated an intent to test a developmental form of matching, the potential of developmental matching in therapy will not be discussed further, although its possible utility in therapy is not precluded in principle.

Behavior

A crucial issue in the selection of measures to assess the consequences of matching is that they be criterion relevant; i.e., they should be couched in theoretically relevant terms if they are to provide an appropriate test of matching hypotheses.

Thus, if one has a primarily theoretical interest in matching, one should ensure that dependent measures are tied closely to theoretical predictions. In the context of contemporaneous matching, two sets of outcome measures would seem to be appropriate. Since this form of matching seeks to establish a comfortable working relationship, one that promotes a sense of rapport between client and therapist, then some form of satisfaction measure is criterion relevant. In addition, the matching of client-therapist conceptual systems implies that the enhancement of communication, understanding, and empathy within the therapeutic relationship. Thus, measures of these variables would be appropriate.

From the standpoint of applied research, however, the central outcome is not necessarily theory development but, rather, the effectiveness of CST in helping with clients' problems. Thus, the requirement that outcome measures be criterion relevant creates certain problems in attempts to test the effects of matching in therapy. Outcome measures that are relevant to applied goals generally include the assessment of client functioning in the domain of symptomatic improvement and change in maladaptive behavior. Where symptoms relate to problems in interpersonal communication, social understanding, and empathy, then a direct theoretical link to CST is possible, and the generation of hypotheses, selection of outcome measures, etc., would create no problems. However, where interest lies in such problems as alcoholism, depression, delinquent behavior, and so on, CST does not provide a theoretical basis for linking these behaviors into matching predictions. Consequently, the finding of matching effects on such outcome variables, while clearly having applied significance, cannot easily be interpreted as support for the matching hypothesis since they currently lie outside the range of convenience of the theory. Inclusion of conventional outcome measures in matching studies is warranted, however, as an exploratory strategy to facilitate further developments of the theory. For instance, it is reasonable to predict that a good "therapeutic alliance" between client and therapist should establish the basis for symptomatic improvement. The theoretical problem, within CST, is to develop the means for making more specific predictions.

EMPIRICAL REVIEW

Included in this review are those studies that have tested the effects of matching in therapy or in an analogous context. In all, 15 studies are reviewed, the main features of which are summarized in Table 1. In order to conserve space, details of the studies and their findings beyond those shown in Table 1 are not presented here.

TABLE 1
Empirical Investigations of Matching Hypotheses

Author	MATCHING COMPONENTS			
	Person	Environment	Behavior	Results
		Conceptual Systems Theory		
Bachman Study I (1976) (6)	1. PCM 2. (<1.67) (>1.67) 3. 40 college Ss, mf. 4. None 5. Not applicable	6. RET counseling session 7. High vs. low structure 8. Yes 9. 22 minutes 10. High	11. Counselor expertness Counselor attractiveness Counselor trustworthiness Counseling climate Counseling comfort Client satisfaction 12, 13. -	m a a a b b
Bachman Study II (1976) (5)	1. PCM 2. (<1.67) (>1.67) 3. 40 college Ss, mf. 4. None 5. Not applicable	6. Self-directed RET exercise 7. High vs. low structure 8. Yes 9. 50 minutes 10. High	11. Client satisfaction 12. - 13. Performance on task Recall of RET rationale	b n.s. n.s.
Berg & Stone (1978) (4)	1. ITI 2. Low vs. high CL 3. 64 college Ss, f. 4. None 5. Not applicable	6. Problem-solving training 7. Instructions vs. modeling 8. No 9. 4 vs. 10 minutes 10. High	11, 12. - 13. Problem formulation Generation of alternatives Choice behavior	 n.s. c,d n.s.
Berg & Stone (1980) (7)	1. PCM 2. (X=1.36) (X=2.19) 3. 60, college Ss, f. 4. None 5. Not applicable	6. Empathy skill training 7. High vs. low structure 8. Yes 9. 50 minutes 10. High	11. Trainee satisfaction Satisfaction with structure Preference for structure Supervisor helpfulness Supervisor understanding Perceived amount learned 12. Reflection of feelings Empathy 13. -	n.s. d d b n.s. b. n.s. n.s.
Brill (1978) (5)	1. PCM 2. Low vs. moderate 3. 43 delinquents, m. 4. None 5. None	6. Training school 7. Staff vs. resident control 8. Yes 9. 12 months 10. Low	11, 12. - 13. Problem behaviors Days out of program Attitude measures Problem behaviors (f-u) Staff-rated success (f-u)	 b b c m m
Davis et al. (1977) (4)	1. PCM 2. (X=1.3) (X=2.2) 3. 40 graduate Ss, mf. 4. None 5. Not applicable	6. Written client statements 7. Concrete vs. abstract 8. Yes 9. <2 hours 10. High	11. Client attractiveness 12. (See Heck & Davis, 1973) 13. -	d

TABLE 1 (continued)
Empirical Investigations of Matching Hypotheses

Author	MATCHING COMPONENTS			
	Person	Environment	Behavior	Results
Heck (1971) (5)	1. PCT 2. Low vs. high CL 3. 30 teacher trainees, f 4. None 5. Not applicable	6. Sensitivity training 7. Programed lessons vs. T-group 8. No 9. 20 hours 10. Low	11. - 12. Communication skill 13. -	 b
Heck & Davis (1973) (4)	see Davis et al. (1977)		11. - 12. Counselor empathy 13. -	 b
Henri & Stoppard (1983) (7)	1. PCM 2. (x=1.3) (x=2.0) 3. 36 female clients 4. yes 5. yes	6. Assertion training 7. Behavior skills vs. cognitive restructuring 8. yes 9. 10 hours 10. high	11. Counselor expertness Counselor attractiveness Counselor trustworthiness Counseling climate Counseling comfort Counseling satisfaction *Satisfaction with* structure Preference for structure 12. Assertiveness of role-played interaction in negative assertion situation 13. Role-play measures: Loudness/affect Latency to speak Speech dysfluencies Number of interactions Assertion inventories (four measures) Self-report anxiety (SUDS)	b n.s. b n.s. n.s. n.s. n.s. n.s. b n.s. n.s. n.s. n.s. n.s. (×4) b
Kimberlin & Friesen (1977) (3)	1. PCT 2. (<1.5) (>1.7) 3. 120 college Ss 4. None 5. Not applicable	6. Empathy training 7. Programmed lesson vs. role playing 8. No 9. 2 hours 10. Low	11. Attitudes to training 12. Empathy to non-ambivalent statements *Empathy to* ambivalent statements 13. Recall of training information	d n.s. c d
Lamb (1977) (7)	1. PCM 2. (<1.67) (>1.67) 3. 68 college Ss, mf. 4. Yes 5. Yes	6. Group therapy for test anxiety 7. High vs. low structure 8. Yes 9. 6 hours 10. Moderate	11. Counselor expertness Counselor attractiveness Counselor trustworthiness Counseling climate Counseling comfort Counseling satisfaction Satisfaction with structure Preference for structure 12. - 13. Test anxiety scale Grade-point average Anxiety differential Digit symbol test	b n.s. b n.s. n.s. n.s. n.s. n.s. n.s. n.s. n.s. n.s.

TABLE 1 (continued)
Empirical Investigations of Matching Hypotheses

Author	MATCHING COMPONENTS			
	Person	Environment	Behavior	Results
Malkiewich & Merluzzi (1980) (4)	1. PCM 2. (<1.5) (>1.67) 3. 59 college Ss, m. 4. None 5. Yes	6. Group therapy for social anxiety 7. Systematic desensitization vs. rational restructuring 8. No 9. 5 hours 10. Moderate	11. Reactions to group leader 12. - 13. Social anxiety scale Social interaction behavior Self-statements	n.s. d d n.s.
McLachlan (1972) (5)	1. PCM 2. (<1.5) (>1.5) 3. 92 alcoholics, mf. 4. Yes 5. Yes	6. Group therapy 7. Low vs. high CL therapist 8. Yes 9. 26 hours 10. Low	11. Therapist social competence Patient-rated improvement 12. - 13. Staff-rated improvement	b a n.s.
McLachlan (1974) (4)	1. PCM 2. (<1.5) (>1.5) 3. 94 outpatients, mf. 4. None 5. Yes	6. Alcoholism after-care 7. High vs. low structure 8. No 9. 12 months 10. Low	11, 12. - 13. Abstinence	 b
Rosenthal (1977) (4)	1. PCM 2. Low vs. high CL 3. 40 counseling Ss, mf. 4. None 5. Not applicable	6. Communication training 7. Guided vs. self-instruction 8. No 9. 4 hours 10. Low	11. - 12. Confrontation skills: Questionnaire (i) Questionnaire (ii) Role-play 13. -	 b b n.s.
Stein & Stone (1978) (7)	1. PCM 2. (.67-1.67) (2.17-2.83) 3. 48 college Ss, mf. 4. None 5. Not applicable	6. Counseling interview 7. Directive vs. nondirective 8. Yes 9. 40 minutes 10. High	11. Client satisfaction Counselor helpfulness Counselor understanding 12. - 13. Client talk-time Client self-disclosure Client goal attainment	a b n.s. n.s. b n.s.

Note: The design index (0-9) is listed under each author's name.

Items 1 to 13 indicate significant aspects of each study:
1 = Cognitive measure used.
2 = Number of subject groups and constituent scores.
3 = Number, kind, and sex of subjects.
4 = Control for verbal ability.
5 = Control of extraneous clinical variables (e.g., type, severity of problem).
6 = General nature of treatment.
7 = Treatment levels.
8 = Independent assessment of intended differences in treatments.
9 = Treatment duration.
10 = Extent of control for extraneous treatment variables.
11 = Measures of client "satisfaction."
12 = Measures of social cognition and behavior.
13 = Measures of 'other' behaviors (e.g., symptoms, overt behaviors, task performance).

Results are indicated as follows: a = disordinal P×E interaction; b = ordinal P×E interaction; c = P main effect; d = E main effect; m = "matching" effect; n.s. = nonsignificant.

Except for the study by McLachlan (1972), which tested the effects of matching the CL of clients and therapists, the studies in Table 1 involved the matching of clients (described in terms of CL) with treatments (defined in terms of degree of structure provided). In three of the studies, clients were drawn from inpatient or residential settings (Brill, 1978; McLachlan, 1972, 1974). Three studies involved volunteer clients in counseling (Henri & Stoppard, 1983; Lamb, 1978; Malkiewich & Merluzzi, 1980). Four studies examined matching in analog therapy situations (Bachman, 1977, Studies I & II; Berg & Stone, 1978; Stein & Stone, 1978). An additional group of five studies tested matching in the context of training in counseling skills (Berg & Stone, 1980; Heck, 1971; Heck & Davis, reported in Heck & Davis, 1973, and Davis, Cook, Jennings, & Heck, 1977; Kimberlin & Friesen, 1977; Rosenthal, 1977). The rationale for including studies in counseling training is that they can be viewed as analogous to the therapy situation, one in which a client (counselor trainee) is engaged in interaction with a therapist (supervisor, trainer) about the communication style of the former. The aim of both therapy and counseling training is to enhance interpersonal communication and facilitate relationships with others.

In Table 1, information about the studies is organized in three columns, one each for the *person* and *environment* components of matching, and *behavior* (measures to assess the consequences of matching). The results for each study are also shown in the column on the far right hand side. The numbered items in the body of Table 1, the explanatory key for which is given at the end of the table, refer to selected aspects of each study's design and procedure. The significance of this manner of categorizing information about the studies is elaborated more fully when the methodological adequacy of studies is evaluated in the next section.

It will also be noticed that the column headed *behavior* in Table 1 includes three categories: *client satisfaction*, *social cognition/behavior*, and *other*. The category *other* comprises measures of symptomatology and client behavior not otherwise included in the first two categories. The reason for this categorization, discussed already, has to do with the criterion relevance of dependent measures. A theoretical basis within CST has yet to be elaborated for predicting the outcome of matching for measures in the category *other*.

The typical research strategy used to investigate the effects of matching has been some variant of a two-way factorial design, with two levels on the person and environment factors, respectively. An initial test of the person × environment interaction term is then followed by a comparison of cell means. The finding of a significant interaction with one or both of the differences between cells, within levels of the person factor, in the expected direction is interpreted as providing support for the matching hypothesis. If comparisons of cell means yield significant findings in the direction predicted by the matching hypothesis, the interaction is described as "disordinal" (denoted by an "a" beside the relevant measure in Table 1). If only one of the comparisons is significant, the interaction is termed "ordinal" (denoted by a "b" beside the relevant measure in Table 1). While this interpretive strategy represents a somewhat conservative approach to the analysis of interactions (Cronbach & Snow, 1977), it is the one most commonly used by investigators and it provides a convenient way of summarizing the research findings.

Some reviewers (e.g., Bracht, 1970) have taken the position that only disordinal interactions have practical implications for matching, since an ordinal interaction leads, essentially, to the same decision rule as a main effect for treatment (i.e., all clients assigned to the most effective treatment). However, there would appear to be several reasons for considering both types of interaction as having implications for matching. First, an ordinal interaction allows for the possibility that a disordinal interaction may have occurred if the range of the study sample on the person variable was extended (Kerlinger & Pedhazur, 1973). Second, as Cronbach and Snow (1977) suggest, an ordinal interaction effect on treatment outcome may become disordinal on payoff (i.e., outcome adjusted for costs associated with the treatments). Finally, where matching involves pairing clients with therapists, interpreting an ordinal interaction in the same way as a main effect for type of therapist would imply selective under- or unemployment of some therapists, a strategy that is unlikely to be implemented easily.

Apart from interactions, some studies also report what are termed "matching" effects (denoted by an "m" beside the relevant measures in Table 1). A matching effect can arise when groups in a factorial design are collapsed to form "matched" and "mismatched" groups, and findings are reported for the main effect of matching rather than examining the person × environment interaction. Typically, this strategy is resorted to when there is client attrition (Brill, 1978) or when further analysis of what appears to be a disordinal interaction fails to reveal differences between cell means (Bachman, 1977, Study I). Although the finding of a significant matching effect may be interpreted as support for the matching hypothesis, such findings are less compelling than interactions, since they may be explained more parsimoniously by person or environment main effects.

Summary of Findings

Examination of the results of studies in Table 1 reveals a number of statistically significant disordinal and ordinal interactions as well as some matching effects. In the 15 studies under review only three failed to report any effects due to matching (Berg & Stone, 1978; Kimberlin & Friesen, 1977; Malkiewich & Merluzzi, 1980). Except in one case, direction of the interaction and matching effects was consistent with the predictions from Hunt's (1971) matching hypothesis; that is, where differential outcomes arose as a function of matching, the more favorable outcomes were always associated with matched rather than mismatched conditions. The one exception to this pattern occurred in the study by Henri and Stoppard (1983). These investigators found that high CL clients, who were mismatched to the structure of assertion training, manifested greater reductions in anxiety, as assessed by the SUDS measure, than high CL clients in the matched group.

Interaction effects were particularly likely to be found in those studies that included measures categorized as *satisfaction* or *social cognition/behavior*, those measures considered criterion relevant. However, some significant interactions on measures in the *other* category were reported in four of the 10 studies that included one or more measures in this category.

In sum, the findings reviewed above appear to offer some support for Hunt's (1971, 1975) contemporaneous matching hypothesis. However, the empirical status and theoretical significance of these findings can be ascertained only after an evaluation of the conceptual and methodological adequacy of the studies from which they derive. We turn now to a discussion of conceptual and methodological issues relevant to matching studies in general and to the specific studies reviewed here.

CONCEPTUAL AND METHODOLOGICAL ISSUES IN RESEARCH ON COGNITIVE MATCHING

The intent of this section is to present a critical analysis of conceptual and methodological issues that arise in attempts to test the matching hypothesis derived from CST. Apart from offering guidelines for researchers planning studies on matching, our purpose is to identify a set of methodological criteria against which to evaluate the adequacy of studies in Table 1. The most convenient way to organize this discussion is to deal with each component of matching separately: person, environment, person × environment matching, and behavior.

Person

Both the CL and concrete-abstract dimensions of CST are based on notions of a typological sequence, reflecting systematic changes in the structure and content of cognitions. CL is couched in terms of individual differences in social cognition and measured in terms of cognitive conflict resolution. As was noted earlier, assessment of CL can be achieved by means of tests, such as the PCM (Hunt et al., 1978), which emphasize structural criteria for scoring, as well as by those that use more content-based scoring systems. These two approaches, structure vs. content biased, however, do not interrelate significantly (Miller, 1978), a finding which suggests that care should be taken in the kinds of hypotheses generated in research. To date, most studies on matching in therapy have employed the PCM, a structure-biased measure, a choice which implies that structure-biased hypotheses should be formulated. However, few investigators show explicit recognition of this issue in their derivation of hypotheses. For instance, the attempt by Brill (1978) to predict change in the *direction* of attitudes, as opposed to *structure* of attitudes, would seem to be inconsistent with this use of a structural measure of CL.

From the research standpoint, the following issues need to be considered in the operationalization of the person component in studies on matching: the range and level of scores on CL, the sexual composition of groups, and the degree of control of variables known to confound the effects of CL.

An adequate test of matching requires that some reasonable degree of separation be achieved between groups of subjects representing different levels of CL. Effects of matching are unlikely to be detected unless there is an adequate representation of the potential range on this variable, and unless experimental groups show a reasonable separation of scores. Due to practical exigencies, investigators have tended to assign subjects to groups based on a median split of CL scores, a procedure that

compromises the clear separation of groups and leads to reduced power in detecting effects of matching (Cronbach & Snow, 1977). A more desirable procedure involves the use of extreme groups where subjects are selected with reference to existing norms, such as those for the PCM provided by Hunt et al. (1978). Among the studies reviewed, problems due to inadequate separation of experimental groups are apparent in Bachman (1977) and Malkiewich and Merluzzi (1980).

Sex of subject is also an important variable in the formation of experimental groups, since there is evidence that women may respond differently than men on measures of CL (Hewitt, 1972). The most efficient way to deal with this problem would be to include sex as an independent variable. However, only one of the studies reviewed used this strategy (Lamb, 1978), the more typical approach being to control for effects due to sex of subject by including only members of one sex (e.g., Berg & Stone, 1978; Heck, 1971; Malkiewich & Merluzzi , 1980). Other studies have used an ad hoc mixture of the sexes in experimental groups (McLachlan, 1972), or, in one instance, failed to report the sexual composition of subject groups (Kimberlin & Friesen, 1977).

In attempting to control for variables that confound the effect of the person factor, individual differences in ability are troublesome. Fairly substantial correlations have been reported between CL and verbal ability (Hunt et al., 1978). Thus, procedures should be instituted to control for the potential confounding effects of individual differences in ability, either through pretreatment matching of subject groups on ability or by post hoc statistical means. In the studies reviewed here, only Lamb (1978) checked for pretreatment equivalence of groups on ability, and Henri and Stoppard (1983) and McLachlan (1972) used verbal ability as a covariate in analyzing the effects of matching.

In sum, while there are a number of conceptual and methodological problems in assessment of the person within CST, with judicious use the current formulations can provide a practical means for dealing with this aspect of matching.

Environment

While the conceptualization of the environment in CST is plausible, in practice its application to the therapy situation engenders a number of problems. Typically, investigators rely on broad labels such as "directive-nondirective" to characterize treatment differences, or designate treatments as high or low in structure without providing supporting evidence in the form of a structural analysis of treatments. For instance, Malkiewich and Merluzzi (1980) compared the effects of systematic desensitization and cognitive restructuring on high and low CL clients. Systematic desensitization and rational restructuring were designated as high and low structure, respectively, on the grounds that they incorporated features that "strongly resembled" those considered to be of greatest benefit to low and high CL individuals.

An additional concern in studies that attempt to manipulate level of structure by using different types of therapy is that treatments will differ on a number of dimensions in addition to their presumed difference in structure. Unfortunately, the con-

founding of type of therapy with structure differences is not discussed by Malkiewich and Merluzzi (1980). However, it seems likely that such differences would play a role in the outcome effectiveness of treatments, effects that may confound those due to cognitive matching, making interpretation of findings difficult. A strategy that may partially offset such problems would be to use treatments known to be similar in effectiveness, on the assumption that any effects due to matching can reasonably be attributed to structure differences rather than other differences among treatments. In the studies reviewed, only that by Henri and Stoppard (1983) appears to have followed this approach to treatment selection.

A crucial issue in setting up matching studies is whose viewpoint should be used to characterize the level of structure provided in a therapy environment. It has been demonstrated, for instance, that subjects differing in CL may derive different amounts of information from the same stimulus array (Bryson & Driver, 1969). Thus, an environment that is defined as "structurally simple" by the researcher (or independent judge) may actually represent a rather different situation to low and high CL clients. Clearly, the client's perception of environmental complexity needs to be incorporated into the definition of therapeutic structure, but how this might be integrated with that of the researcher and judge is an open question, one that is not resolved in the studies reviewed here. In practice, several studies use client ratings as a post hoc check on structural differences between treatments, and it appears that, in all cases, these were consistent with ratings of independent judges and in line with structure differences intended by the researchers (Bachman, 1977; Berg & Stone, 1980; Lamb, 1978; Stein & Stone, 1978). In the absence of more sophisticated measures of structure, such checks provide some support for the validity of attempts to manipulate treatment structure.

Given that some attempt has been made to manipulate treatment structure, it is important to consider the extent to which differences between treatments are actually achieved, an adequate test of matching requiring that there is a reasonable separation of treatments on the structural dimensions chosen. In the studies included in Table 1, degree of therapist control has varied from a situation that is almost entirely therapist controlled to one where treatment purports to be client directed. However, client choice about the conduct of therapy has rarely extended to questioning the values and goals of therapy or the therapist. As a consequence, many studies entail a contrast between treatments of which both are relatively high in structure.

An alternative strategy for defining the environment component of matching is in terms of therapist CL. In the studies reviewed, only that by McLachlan (1972) defined the environment component in terms of type of therapist. The advantage of this strategy is that both patient and therapist can be conceptualized in an identical manner and matched by the same measurement procedures. This allows for greater precision of matching. However, this strategy assumes, and is based on, the supposition that person characteristics imply stability of functioning and that therapists, so described, will favor a particular range of therapeutic techniques. There is some support for this latter contention in education where consistent relationships have been established between CL and teaching style. Thus, low CL teachers consistently show greater "dictatorialness," a cluster of behaviors that includes being more directive,

controlling, and punitive than high CL teachers who foster greater independence, questioning, and dialogue (Coates, Harvey, & White, 1970). Similar patterns have been detected between CL and therapeutic style (Goldberg, 1974; Lichtenberg & Heck, 1979), which adds credence to this matching strategy.

It follows from the earlier discussion of the person component that investigators should ensure that there is an adequate range and level of CL represented among the therapists selected to participate in a study. In practice, investigators are likely to be restricted in their choice to those therapists available in a particular setting, a situation which, in the study by McLachlan (1972), may have resulted in a relatively limited range of therapist CL.

A potential problem arising whichever strategy is used to define the environment component of matching stems from the tendency of therapists to adjust to the demands of patients. In educational settings, it has been found (Rathbone, 1971) that high CL teachers are more susceptible to student "pull" than low CL, adapting their teaching style to the kind of student being taught. There is every reason to believe that therapists will behave in a similar manner. If this shift in style occurs, then a problem will arise in endeavoring to maintain mismatch conditions. Careful monitoring of mismatch conditions is called for. Commendably, in his study of the effects of patient-therapist matching, McLachlan (1972) monitored therapy sessions to ensure that therapists maintained consistent differences in style over the course of treatment. However, in only three of the other studies reviewed (Brill, 1978; Henri & Stoppard, 1983; Lamb, 1978) was any check made on the consistency with which treatment conditions were applied by therapists.

Choice of an appropriate treatment duration is also an important consideration in setting up adequate tests of the matching hypothesis. Duration of treatment would seem to depend on the goals of matching, which should be reflected in the kind of dependent measures used to assess the effects of matching. In studies that aim to enhance client satisfaction and comfort in therapy, treatments of relatively short duration would seem acceptable. However, where effects of matching are assessed in terms of outcome, rather than process, then somewhat longer durations would seem to be required. Among the studies reviewed, problems with inadequate treatment duration, in relation to the type of dependent measures used, are apparent in Berg and Stone (1978, 1980), Heck and Davis (1973), and Kimberlin and Friesen (1977).

An additional consideration in evaluating the adequacy of the environment component is the degree to which factors extraneous to the intended treatment manipulation have been satisfactorily controlled. In studies involving group treatment procedures, a potential source of confounding is the CL composition of groups. It has been shown that heterogeneity of group members in terms of CL is an important variable in small-group decision making (Stager, 1967). In studies using group procedures, control for the effects of group composition could be achieved by use of groups that are homogeneous for CL, a procedure that was used in the study by Henri and Stoppard (1983). The more usual procedure has been to randomly assign both low and high CL clients across treatment groups, a procedure that may well increase the possibility of false negative results.

In sum, while operationalization of the environment component of matching

probably represents the area of greatest weakness in studies to date, hopefully attention to the methodological guidelines outlined above would serve to overcome many of these problems.

Person × Environment Matching

A "match" involves a person-environment pairing that, ideally, has a specific intent. The precision of matching achieved depends on the adequacy with which the person and environment components have been operationalized. Although the general principles of matching are reasonably clear in CST, a practical problem that arises in establishing matches is caused by the apparently curvilinear relationship between environment and behavior (Schroder et al., 1967; Streufert & Streufert, 1978). This curvilinear relationship, which is depicted in Figure 1, suggests that slight shifts in the complexity of treatments may result in markedly different consequences for client outcomes under conditions thought to be "matched." It is also quite possible, as illustrated in Figure 2, that treatments, clearly different in complexity, if inadvertently located on either side of the level presumed to be optimal for the clients in question, may result in no apparent differences in behavior between low and high CL clients. At present, there appears to be no way to select treatments with the accuracy needed to locate them at specific points on the complexity dimen-

FIGURE 1

Differential effects of treatment conditions on behavior in relation to conceptual level of subject, based on the curvilinear relationships proposed by Schroder et al. (1967). Levels A and B, A' and B' represent treatment conditions that may result in ordinal interactions of two kinds.

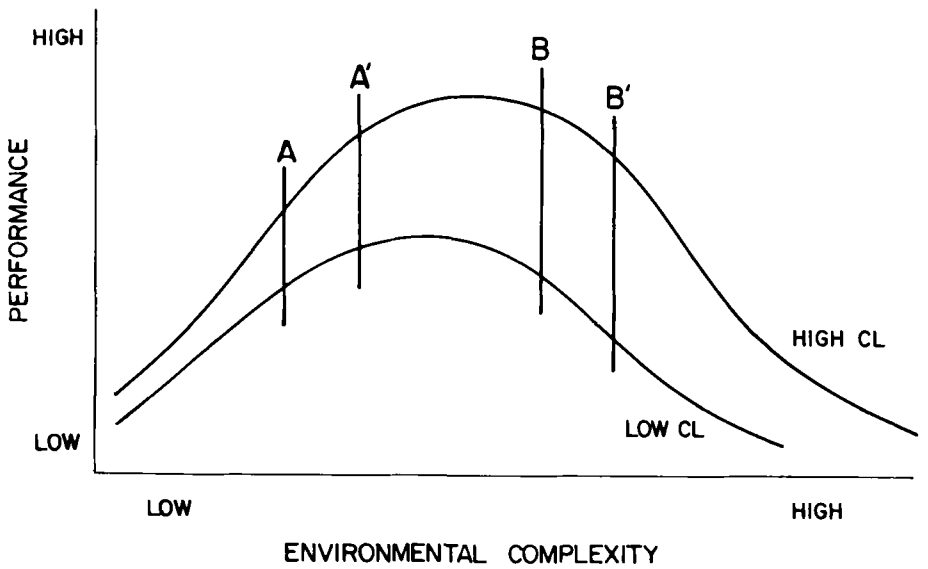
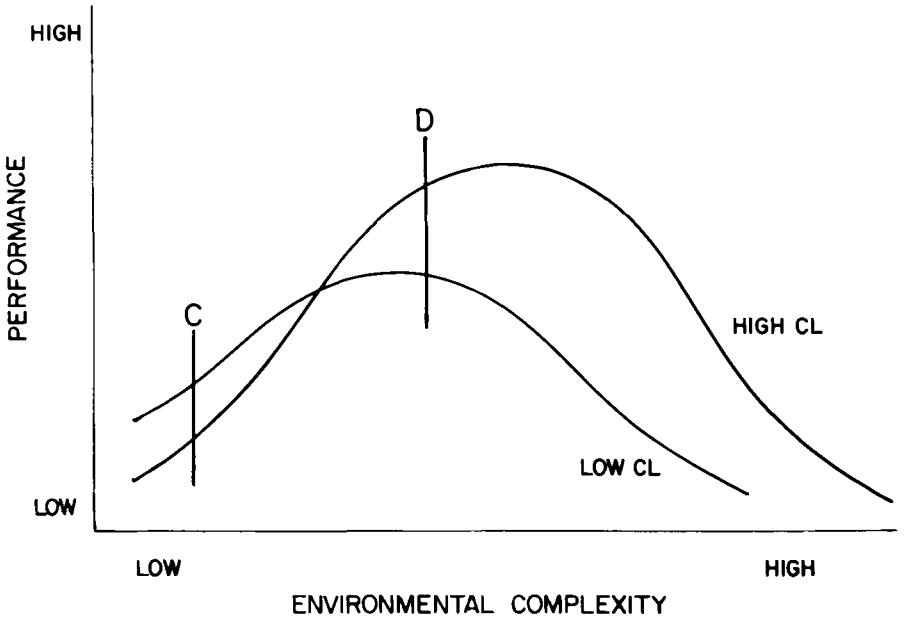


FIGURE 2
A hypothetical set of relationships between environmental complexity and task performance in which the lower levels of environmental complexity are highly structured, or otherwise aversive to high conceptual level subjects. Levels *C* and *D* represent treatments that may result in disordinal interactions.



sion. It is reasonable to conclude, therefore, that the conditions that lead to the demonstration of disordinal interactions can only be approximated. Thus, if precision of matching is to be achieved, close attention to the level of structure incorporated in treatments is a prerequisite.

When the environment component is defined in terms of "type of therapist," precision of matching would appear to be more easily achieved, since patient and therapist are assessed in the same way. However, in the single study using this matching strategy (McLachlan, 1972), the precision of the match is compromised by differences in the specific levels of CL among clients and therapists in matched and mismatched conditions. This problem could be avoided if researchers adhered to the cut-off points, advocated by Hunt et al. (1978), used in identifying low and high CL groups.

Behavior

As noted earlier, the effects of matching can be demonstrated persuasively only if the dependent measures used are theoretically consistent with the intent of the match, i.e, they should be criterion relevant. Since all of the studies reviewed appeared to be testing the contemporaneous form of matching, the purpose of which is

to create a comfortable therapy environment for the client, it follows that criterion relevant measures would involve assessment of client satisfaction with therapy or therapist. Outcome measures that assess social behavior or social cognition in such areas as conflict resolution and empathy skills would also be criterion relevant.

A problem arising in several studies concerns the use of non–criterion-relevant measures (e.g., nonsocial behavior or symptom measures such as alcohol consumption) in the absence of any elaboration of the conceptual basis for expecting matching effects on such measures. As an exploratory procedure, there is little wrong with such strategies, for they may facilitate the development of theory. However, as a test of matching hypotheses, findings on non–criterion-relevant measures are less compelling than those on measures having more direct relevance to the theory. In studies reviewed, problems with the criterion relevance of dependent measures are particularly apparent in Berg and Stone (1978), Brill (1978), Malkiewich and Merluzzi (1980), and McLachlan (1974).

Adequacy of Matching Studies

In order to evaluate the adequacy of matching studies, the methodological issues discussed above were incorporated into a design index. This index was composed of the following nine points, considered most crucial for an adequate test of matching: adequacy of range and separation of subjects on CL; control for sex of subject; control for verbal ability; adequacy of the range and level of structure on the environment variable; consistency with which treatment conditions were applied; appropriateness of treatment duration; control of extraneous treatment variables (e.g., group composition); precision of matching achieved; and the criterion relevance of dependent measures.

The design index was applied to the 15 studies in Table 1, one point being given for what was judged to be a reasonably adequate attempt to meet a particular design requirement. The design index score is shown in parentheses under the reference to each study on the left of Table 1. A score of 9 would indicate a well-executed study, dealing in an efficient way with the basic methodological requirements. Design scores arrived at in this way ranged from 3 to 7, with a mode of 4. While the overall quality of the studies is quite modest, the results obtained in the reasonably well-executed studies may be viewed with some confidence. Five studies received scores of 6 or 7: those by Bachman (1977, Study I), Berg and Stone (1980), Henri and Stoppard (1983), Lamb (1978), and Stein and Stone (1978). These five studies reported interactions in keeping with predictions from Hunt's (1971) matching hypothesis. Two of these studies (Bachman; Stein & Stone) reported disordinal interactions, and all five reported at least one ordinal interaction. As mentioned in the previous section, one of the ordinal interactions reported by Henri and Stoppard (1983) was in the opposite direction to that predicted by Hunt's matching hypothesis. High CL clients in a high-structure form of assertion training program reported greater reduction in anxiety following training than high CL clients who received a low-structure form of assertion training. Since the measure of anxiety was not considered criterion

relevant, this finding should not be given much weight in evaluating the empirical status of the matching hypothesis.

Of the five studies judged to be reasonably well designed, only that by Berg and Stone (1980) reported treatment (E) main effects on any dependent measures. In fact, among the studies as a whole, treatment main effects were reported far less frequently than interaction effects. The three studies that did not report any interaction effects (Berg & Stone, 1978; Kimberlin & Friesen, 1977; Malkiewich & Merluzzi, 1980) were among the six studies receiving design index scores of 3 or 4, the lowest scores in Table 1.

An additional observation from Table 1 is that interaction effects were much more likely to occur in studies incorporating dependent measures that were theoretically relevant. For instance, in the 10 studies that included at least one *satisfaction* measure, only three studies—those by Davis et al. (1977), Kimberlin and Friesen (1977), and Malkiewich and Merluzzi (1980)—did not report any interactions for this category of measure. These latter three studies also had low design scores. Similarly, a majority (four of six) of the studies including one or more measures of *social cognition/behavior* reported ordinal interactions. Of more applied interest is the finding that in the 10 studies with one or more measures in the *other* category, three reported interactions in keeping with Hunt's matching hypothesis. In two of these studies, those by Brill (1978) and McLachlan (1974), the measures on which interactions occurred, frequency of delinquent behavior, and abstinence from alcohol consumption, respectively, have direct clinical relevance as therapy outcome measures.

It is also apparent from Table 1 that there is a large number of measures for which nonsignificant findings were reported. Given the relatively modest methodological adequacy of the studies overall, the meaning of these nonsignificant results is less than clear. It is possible that the measures themselves were not sensitive enough to detect effects (matching or otherwise), or perhaps other methodological weaknesses in the studies served to reduce the likelihood of interaction effects emerging. In any case, the relatively low methodological adequacy of the studies suggests that the possibility of false negative results cannot be ruled out.

It is reasonable to conclude from the interaction effects reported in the majority of studies, particularly in the better designed ones, that there is some foundation for interpreting the empirical findings as providing support for matching hypotheses derived from CST.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Future Directions for Research

The most pressing need is for improvements in the methodological quality of studies along the lines indicated earlier. In general, many methodological problems arise from inappropriate application of CST. This would imply that better designs would result if investigators were to become more familiar with the theory and its

range of convenience. This applies particularly to the generation of hypotheses and the selection of outcome measures, both of which need to be criterion relevant. More attention also needs to be paid to the conceptualization and measurement of the environment component. Until more accurate assessment of the therapy environment is possible, in terms of structure and control, the precision of matching achieved is likely to remain limited.

Much of the research has been restricted to analog situations, only a few investigators (e.g., Brill, 1978; McLachlan, 1972, 1974) testing matching under genuinely clinical conditions. Although effects of matching have been reported in several studies involving volunteer clients seeking counseling for adjustment problems (e.g., Henri & Stoppard, 1983; Lamb, 1978), the extent to which such findings can be generalized to clients in typical clinical settings is less clear. While analog studies obviously have an important part to play in the initial evaluation of matching hypotheses, the need at this time is for more clinically relevant investigations of matching.

Attempts to extend research into clinical settings inevitably raise practical and ethical problems, although these would not appear to be insurmountable. One practical difficulty that often arises is the absence of a sufficient number of clients to ensure adequate range and level of CL. Similarly, investigators need to have a large pool of therapists from which to select different "types." Thus, attempts to evaluate matching in clinical settings might only be feasible in larger centers where the pool of clients and therapists is sufficient to meet the requirements of research designs.

In evaluating the effects of matching, it is necessary to expose some clients to a "mismatched" condition, a strategy that raises important ethical issues. One argument in support of matching research is that current practice inadvertently results in many "mismatches." Thus, a research design involving mismatches would not expose individuals to any less advantageous treatments than might otherwise occur. A more serious problem, however, concerns the issues of client choice, preference for treatment alternatives, and informed consent. Presumably client rights could be best protected, without limiting the scope of a study, when relatively large samples are available and clients not wishing to participate could readily be replaced in the design. Another possibility, less restrictive than a factorial approach, would be to use regression designs, although relatively large samples would still be required.

Utility of CST for Therapy

All of the studies reviewed have tested hypotheses derived from CST, the assumption being that the theory has some relevance to therapy. While the empirical findings appear to support the usefulness of CST in generating testable hypotheses about person × environment interactions in therapy, it is necessary to address the more specific questions: What is the range of convenience of CST and what aspects of therapy does it help describe?

CST has most relevance to the way in which client and therapist interact as well as with individual differences in dealing with interpersonal information in the

therapeutic situation. Thus, CST and the matching hypothesis derived from it provide a basis for conceptualizing and establishing initial conditions in therapy to facilitate client-therapist communication and a sense of rapport. Matching clients and therapists in terms of style of communication and need for structure could be seen as an important first step in the therapy process, one that would foster clients' continued involvement in a therapy relationship. Most client dropouts from therapy occur during the first few sessions. Thus, matching clients with type of therapy or therapist, with the improved levels of client-therapist communication that matching implies, presumably would lead to lower rates of client attrition. In this regard, it is noteworthy that among the studies reviewed, significant interactions were most likely to occur on measures that tapped aspects of client "satisfaction" with therapy and/or therapist.

As discussed earlier, current formulations in CST do not readily provide a theoretical basis for linking client symptoms or maladaptive behaviors with matching predictions. The exclusion from theoretical consideration of any conception of client problems outside the domain of social cognition would appear to place serious limitations on the clinical applicability of matching strategies derived from CST. However, despite the lack of theoretical justification for assessing the consequences of matching in terms of symptomatic behaviors, at an empirical level measures of client symptoms have yielded some promising findings. For instance, rates of problem behaviors in delinquent youth (Brill, 1978) and success in maintaining abstinence from alcohol (McLachlan, 1974) have been found to be influenced by matching in ways consistent with Hunt's (1971) matching hypothesis. Such findings suggest that there is some potential for extending CST to include the conceptualization of symptoms and other types of outcomes that currently lie outside the range of convenience of the theory.

While theory development exceeds the scope of this review, some indications of the form such developments might take can be outlined. CST speaks most directly to that aspect of therapy referred to as the "therapeutic relationship." In this respect, matching aims to foster the establishment of a comfortable working relationship between client and therapist. In the context of the "therapeutic relationship," the client is paired with a set of environmental demands (i.e., therapy procedures, interventions) with which he or she is able to cope using currently available concepts and strategies. An argument could be made that matching provides a basis for linking therapy process with therapy outcome, where the therapeutic relationship (process) serves to facilitate the involvement of the client in ongoing therapy activities designed to ameliorate specific symptoms (outcome). In this way, the initial establishment of a therapeutic relationship that is satisfying to the client would seem to be an important prerequisite to subsequent improvement on outcome criteria assessed in terms of symptomatic behaviors. Thus, to the extent that matching is successful in creating a satisfying, comfortable client-therapist relationship, it would be predicted that therapy would lead to greater improvement in client functioning on conventional outcome measures.

From the standpoint of practicing clinicians, several suggestions can be offered for those interested in exploring matching ideas within the framework of CST. First,

consideration could be given to incorporating the PCM (Hunt et al., 1978) with other pretherapy assessment procedures to gain information about the CL of clients. The PCM takes little time to administer and utilizes a sentence-completion format, one with which most clinicians are familiar. Scoring procedures, while fairly time consuming at first, are easily mastered after some experience with the practice examples in the PCM manual (Hunt et al., 1978). Knowledge of client CL would serve useful adjunct to clinical decision making regarding therapy strategies for particular clients. With clients scoring at the low end of the CL continuum, a more structured approach within the therapy orientation favored by the therapist might be considered. Conversely, a client scoring in the high CL range might be offered a less structured variant within the same general therapy approach. In each case, ongoing monitoring of client progress would allow the therapist to make some judgments about the appropriateness of the level of treatment structure chosen. Knowledge of client CL could also suggest tentative hypotheses regarding reasons for client resistance or lack of progress in therapy. For instance, if a low CL client has made little progress following a period of relatively nondirective therapy, then a switch to a more structured therapy approach might be tried.

A second suggestion, which could be applied on an experimental basis, would involve allocating clients to therapy programs as a function of their CL. It is usual for large treatment centers to have a variety of group programs available to clients. Such programs commonly range from the highly structured, focusing on the acquisition of specific skills (e.g., social skill training groups), to ones that are primarily governed by client concerns and interests (e.g., various forms of "group therapy"). Often, the general aims of such programs are couched in similar terms, e.g., to enhance interpersonal functioning. Decisions about the placement of clients in particular groups are determined more often by availability than by client suitability. It would seem a relatively simple matter, in such settings, to institute a system of allocating clients to programs on the basis of their CL and the degree of structure provided.

In the studies reviewed, it will be recalled (see Table 1) that there was a preponderance of ordinal interaction effects compared to the number of disordinal interactions reported. Moreover, with only a few exceptions, ordinal interactions arose because low CL subjects responded more favorably under matched than mismatched conditions. Generally speaking, high CL individuals were less affected by differences in environmental structure. This pattern of findings would suggest a further practical application stemming from matching principles. In situations where therapy resources are limited, preference might be given to use of more highly structured therapy approaches such as skill training or behaviorally oriented treatments, rather than less structured approaches such as client-centered or insight-oriented methods, since the former are likely to be of benefit to a greater proportion of clients.

CONCLUSION

Contrary to recent views about the potential for identifying consistent interactions that would provide a basis for matching clients to therapies or therapists (cf. Smith, Glass, & Miller, 1980), it is concluded here that the results of research within the

framework of CST have been quite productive, as witnessed by the empirical findings reviewed earlier. Availability of a theoretical framework, such as that provided by CST, has aided in both the search for, and the identification of, interactions and in interpretation of findings. These findings are encouraging enough to warrant further research, with greater attention given to the methodological adequacy of studies, guidelines for which were presented earlier. While offering a promising avenue for answering the question of which treatment (or therapist) is best for which client, nevertheless the form of matching derived from CST should best be viewed as a useful hypothesis with the potential for enhancing therapy effectiveness, rather than as providing an established set of rules for matching clients to treatments or therapists.

NOTE

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