Scripted Thinking and Faulty Problem Representation: The Effects of Theoretical Orientation, Level of Experience, and Temporal Order on Causal Judgement

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Abstract

This paper examines some of the sources of bias that enter into counsellors' formulations of causal hypotheses and client problem representations. First, there will be presented a brief overview of attributional research bearing on certain heuristics used by counsellors in the selection of data for consideration as well as certain logical errors and hazard-prone strategies that lead to erroneous or inadequate problem representation. Second, a study of the think-aloud protocols of 32 subjects, counselling psychologists, as they examined the file of one clinically diagnosable individual is presented. The strategies they employed in representing the problem of the client are examined in the light of subjects' theoretical orientation and experience. Third, the implications of the findings for the training of counselling psychologists are explored. Training exercises and procedures as well as instructional modules are suggested for attenuating the distorting effects of theoretical set, primacy-recency in data presentation, mood and affect in the clinician, and the manifold pitfalls of a logical character to which counsellors are prone in matters of social judgement.

Résumé

Le présent article examine quelques sources de biais qui s'insèrent dans les formulations émises par les conseillers et conseillères sur les hypothèses causales et les interprétations de cas. En premier lieu, il y sera présenté une brève démonstration sur les recherches portant sur certains "heuristiques" utilisés par les conseillers et conseillères dans leur sélection de données pour leurs évaluations ainsi que certaines erreurs de logique et de stratégie pouvant être dangereuses et qui peuvent amener à des conclusions erronées. En second lieu, une expérience faite avec 32 sujets, tous des conseillers psychologiques, porta sur l'examen du dossier d'un individu au profil psychiatrique. Les stratégies qu'ils et qu'elles ont utilisées seront examinées dans l'optique de leurs orientations théoriques et de leur expérience. En troisième lieu, nous explorerons les répercussions qui pourront influencer la formation des conseillers et des conseillères dans leur pratique. Nous suggérerons des exercices et des procédures aussi bien que des modules d'instruction pouvant aider à atténuer la distorsion des préconceptions théoriques, le tempérament et l'émotion du clinicien ou de la clinicienne, et les divers pièges de caractère logique dont les conseillers et conseillères sont menacés en matière de jugement social.

COUNSELLOR VARIABLES THAT INFLUENCE INFERENTIAL PROCESS

Theoretical and Research Background

There now exists a significant body of research findings, gathered principally in the last decade, bearing on the clinical reasoning that mental health professionals engage in when they attempt to help those who have come to them for help (e.g., Arkes & Hammond, 1988). Some of the questions that they have asked are: How do counsellors, social workers, clinical psychologists, and other helpers build an information base with

which they can adequately represent the problems which their clients bring to them? How do they configure such information in view of accurately formulating, not only the problem, but also the etiology of the problem and its treatment? What characterizes the reasoning or, more broadly, the inferential processes by which they formulate, first, tentative, then definitive hypotheses about what is troubling the helpee? And what are the personality and theoretical variables that are most influential in giving direction to clinicians as they try to puzzle out, in collaboration with their clients, the nature of the problem that faces them?

It should be noted at the outset of this discussion that the problem representations that counsellors and other clinicians must make are based on a reality that is much more complex than that which faces a physicist or engineer or other practitioner of one of the natural sciences. The information that troubled people present to counsellors is often disorganized, fragmentary, ambiguous, distorted, inconsistent, emotion-laden, cryptic, symbolic, and defensive (Dumont & Lecomte, 1987). It is not only clinicians' task to make sense of a body of information that may reflect the true state of affairs, it is their task to seek out such information, verify it, discard what, in their judgment, is suspect and self-serving if not downright false, and finally decide when they have all the facts that are necessary to proceed with a final diagnosis and a treatment of choice.

Needless to say, experts generally approach this complex and formidable task with more efficient strategies, greater rapidity, and a more sensitive response to serendipitous cues than do those who have little experience and training (Dumont, in press). Moreover, the kind of training one has received and the paradigms one has been trained to work in and feel comfortable in profoundly influence the kinds of information one seeks out. One only has to compare the probing strategies of a strictly stimulus-response behaviourist with those of a psychodynamicist. Not only would their typescripts reveal sessions that vary differently in terms of interactional structure, but the information focused on would relate to different aspects of the counsellee's life. In many cases they would seem to be reaching for different realities.

At a more basic level, independent of depth of knowledge, expertise, or character of training, the very notion of what a clinical fact is is not well appreciated by many clinicians. It has been found that many clinicians, not to mention students, are insufficiently sensitive to the inferential character of the information on which they build a diagnosis and (consequently) a treatment plan (Nisbett & Ross, 1980). It has been established that clinicians, experienced as well as neophyte, make judgements about their clients that courts of law would never tolerate. Yet

there is often no less at stake in terms of the future wellbeing of the client in the one context than in the other.

All communication is by its nature partial and fragmentary. Indeed, a client's reality, we recognize, can never be fully revealed to a helper, especially through the medium of a conversation. If one defines an inference as any judgment that goes beyond the information that is given, then one must place every communication on a continuum of inferential content. This is as true of the talking that goes on in a counselling session as that which goes on in the kitchen. Talk about a person's reality in the aseptic environment of one's clinic or office is a pale and fragmented representation of that reality; it is certainly very different from living or having lived it.

Theories As Belief Systems

Systems for helping people with psychological, behavioral, or emotional problems can be considered in most instances to be belief systems. Counsellors as well as other kinds of therapists become profoundly committed to those systems, which explain not only the causes of people's behaviour, but also the unfolding dynamics of those behaviours in a clinical setting (Bishop & Richards, 1984; Houts, 1984). In fact, there is a considerable literature (Snyder, 1984) affirming that clinicians' theoretical convictions as they get expressed in the helping relationship bring about the very behaviour that confirms their belief in their system. Clients can even be brought to think that they have had the experiences that the theoretical approach of their clinician presumes them to have had. No less a clinician than Freud (as cited in Turk & Salovey, 1987, frontispiece) admitted that the sexual seductions that certain of his clients seemed to remember had never occurred and that he himself may have been responsible for leading them to make such admissions. More seriously, it has been suggested that researchers' theoretical orientation influences the ways in which their research is conducted (Kazdin, 1983). The findings that eventually shape professional practice are themselves determined by the theories that gave rise to the research that generated them. Theory, practice, and research are symbiotically tied together, caught, as it were, in a self-reinforcing cycle.

In a work that stands as a landmark of psychological scholarship Bandura (1969) stated:

> School affiliations not only determine the range of procedures that a therapist will employ in his practice, they also define the client's central problems which the techniques of the school are designed to resolve. Psychoanalysts will uncover and resolve Oedipal conflicts; Adlerians will discover inadequacy problems and alter...compensatory

> power; Rogerians will unearth self-[vs]-ideal discrepancies; Rankians will resolve separation anxieties; existentialists will — promote awareness of self-consciousness. (p.80)

Psychotherapists often formulate their diagnostic ideas within the first 30 to 60 seconds of the initial assessment interview (Gauron & Dickinson, 1969). Sandifer, Hordern, & Green (1970) concluded that "the first three minutes of observation have a significant and sometimes apparently decisive, impact upon the final diagnostic decision" (p. 968). This tendency for mental health professionals to precipitously formulate diagnoses was found to exist regardless of their theoretical orientation or their level of experience.

Limitations of Expertise

There is a broad literature emanating from the field of cognitive science that examines the skills that experts in various domains bring to the practice of their profession. Whether one is speaking of radiologists or physicians or chess players or microbiologists, there are characteristics of their practice which they seem to have in common. Johnson, Duran, Hassebrock, Moller, Prietula, Feltovich, & Swanson (1981) found that experts are able to recognize the salient aspects of a problem and interpret quickly the information that is related to the solution. They are better able than novices to look for the operations that can be utilized to solve the problem (Greeno & Simon, 1985). For example, they are very efficient at searching for, and making selective use of, data that are meaningful within their own frame of reference. The encoding and retrieval of innumerable facts in long-term memory, and the application of conventional procedures occur with relative ease and a certain automaticity. The question arises, "what information will I use and what will I discard?". As one counselling routine or another is triggered, information that others using a different approach would consider important is rejected as irrelevant. The question then arises, are the tentative diagnoses that are formulated on the basis of one set of data different from those formulated using a different set of data? One can plausibly suspect they would be.

There are other characteristics of expert systems that have implications for practitioners of the helping relationship regardless of the discipline. Highly experienced professionals operate on a more abstract level than do the newly trained. They have a repertoire of principles, often reduced to time-saving rules of thumb, that they swiftly apply even before they have made a full assessment of a case. The ore that they mine is that which their long experience indicates will reward a search. There is reason to suspect that this speed is often at the cost of accuracy and of due

consideration of variables that are given less prominence in their theoretical approach. The study described below investigated whether this was true or not.

A corollary of the above is that novices are not as fast as experts in problem representation. Whether this is true of counsellors as well as chess players needed to be studied. Paul Meehl demonstrated 30 years ago (1960) that clinicians tended to formulate clients' problems in the first sessions of a helping relationship. They also tended to maintain them over the next 20 sessions. What needs to be determined is whether such rapid problem assessment is an unalloyed good. Accordingly, among the many other characteristics that may distinguish experts from novices that need to be addressed (for example, the matter of skilled patterning and chunking of data and of transferring skills from one counselling domain to another) is the penchant for premature closure.

There is evidence in the personality and social psychology literature (as well as that of educational psychology) that everything that we learn about a person has a potential to influence later perceptions that we may form of that person on the basis of further information (Anderson, 1965; Jones, Rock, Shaver, Goethals, & Ward, 1968). For example, if we are informed that an individual is deceptive and manipulative, later information that he is generous or highly sociable tends to be interpreted as in the service of those former attributes. The classic, often-cited investigation of this effect was done by Solomon Asch (1946). He asked subjects to evaluate a person who was intelligent, industrious, impulsive, critical, stubborn, and envious. This series of descriptors moves from attractive to increasingly repellent qualities. He discovered that their evaluation was more positive than if those adjectives were presented in a reverse order, beginning with envious and stubborn. Favourable or unfavourable impressions created by the early impressions tended to persist. A comparable phenomenon occurs with advance organizers (Ausubel, 1960). In psychopedagogy it has been proven useful to present a conceptual overview of a complex system as it helps to shape our later cognitive organization of that system. A mistake early in one's political career seems to have a much more disastrous effect than a comparable one later on. Later mistakes are palliated by "a good record".

Whatever the case may be for any one of these situations, the implications of this phenomenon are evident for the assessment of a case file or of a client presenting for the first time. The most reliable information provided to clinicians is that which follows the establishment of trust and good rapport, not that which is presented before. The question arises then: are one's representations of client problems shaped more by the earlier-divulged than by the later-divulged information? If so, there is the danger that client data that are more distorted, guarded,

self-protective, and innocuous to the self-image of the client will be disproportionately influential in shaping the assessment.

The study that is described below has systematically investigated this variable as well as others referred to above.

EXPERIMENT

In view of the statement of the problem, it is not yet clear: (1) what factors influence clinicians' diagnostic reasoning processes during the first interview, and given those factors, (2) in what ways clinicians think about their clients' problems. The present study sought to determine the effects of clinicians' theoretical orientation, level of experience, and temporal order of client information on client problem representation, diagnostic impressions, hypothesis formulation, and hypothesis-testing strategies. Theories as belief systems seem to determine the character of causal attributions made in formulating client problems. Two factors relating to the causes of client problems that are of particular importance to this study are *dispositional* attributions and *contextual* attributions. The term *dispositional* refers to information that is *predominantly* intrapsychic in kind. Data of a dispositional nature emanate from within the individual. They describe personality characteristics, characterological traits, cognitions, affect, mood, and behaviour that are causally related to the internal personality structure of the individual. Although *primarily* related to the distant past, data of a dispositional nature can be linked to the recent past as well as to the immediate present. They may be real or fictive in nature. The term *contextual*, on the other hand, refers to information that is *predominantly* situational in kind. Contextual data are environmentally-determined and act as external stimuli or stressors for the individual. As an external force acting on the individual, these stressors may potentiate or heighten the expression of an existing characterological trait. However, in causal terms, they derive from the environment. Although data of a contextual nature describe external stimuli that are linked *primarily* to the recent past and immediate present, in some instances contextual data are linked to the remote past. It is understood that, in practice, the terms *dispositional* and *contextual* are not mutually exclusive. Although they are not independent, it is the *predominance* of one or the other that indicates into which category the data fall.

This study investigated the following dependent variables: (1) character of the attribution (is it dispositional or contextual?), (2) hypothesis-testing strategy (is it a preliminary, confirmatory, or disconfirmatory strategy), and (3) final diagnostic operation (is the attribution made for the first time, or if not, is it either retained or rejected?). The independent variables are: (1) theoretical orientation (were clinicians psychodynamically-oriented or

behaviourally-oriented?), (2) level of experience (were they novice or expert?), and (3) temporal order of information (was dispositional information presented first, followed by contextual information or contextual information first followed by dispositional information?).

Method

Subjects

An invitation to participate in a study on inferential reasoning was sent to 190 counselling psychologists practising in a multiplicity of settings such as Montreal schools, universities, hospitals, clinics, as well as in the private sector. A personal data form was included with the invitation to participate. Those clinicians wishing to participate were asked to complete the form and return them with the signed agreement- to-participate form. Subjects were selected according to two factors: (1) their preferred theoretical orientation and (2) their level of experience. After receiving and processing the form, 32 subjects were selected to participate in the study. Theoretical orientation, the first inclusion-exclusion factor, was calculated by asking clinicians to report their preferred theoretical orientation. Clinicians were requested to place themselves on a continuum from one to ten; one, being the most psychodynamic and ten, the most behavioral. For the purpose of this study, those who rated themselves as one through four or seven through ten were considered to have met the inclusion criteria for theoretical orientation. It is understood that there is a degree of overlap with regard to the philosophical, theoretical, and clinical underpinnings of the psychodynamic and cognitive-behavioral/behavioral schools of thought. However, for the purpose of this study it was thought that the selected orientations would adequately capture the between–groups differences for the variables under investigation. The second inclusion-exclusion factor, level of experience, was ascertained by calculating the number of years of continuous practice the clinician had experienced. For the purpose of this study, clinicians participating in an internship at either the masters or doctoral level or those in their first year of practice were referred to as low- experienced (or novice); clinicians with five or more years of clinical practice were referred to as high-experienced (or expert).

Procedure

Clinicians who met the selection criteria were contacted and a meeting was arranged. At the meeting subjects were presented with the case file of an individual named John S. and were informed that a think-aloud procedure would be utilized. The entire procedure was audiotaped by cassette recorder.

The case file that was presented to subjects is an elaboration of a case reported in the DSM-III-R Case Book (Spitzer, Gibbon, Skodol, Williams, & First, 1989). As reported in the Case Book, the "Stubborn Psychiatrist" (p. 107) exhibits the symptoms of and meets the criteria for passive-aggressive personality disorder, indicated on Axis II as 301.84. It was decided that, in order to study clinicians' reasoning processes in greater depth, a more elaborated case would be appropriate. Therefore, material was added to the case that would better describe the symptomatology. Interraters using DSM terminology agreed that the material added to the case placed John S. in the category of both passive-aggressive and narcissistic personality traits. The criteria for passive-aggressive personality and narcissistic personality were used descriptively in order to develop a symptomatology in the case history that was consistent with the DSM-III-R. Thus it was the accuracy of clinicians' descriptive problem representations relative to the symptoms that were presented in the case file that were studied. Preparation for the assessment of the case file was accomplished by way of three practice tasks. The practice tasks enabled subjects to become comfortable with the think-aloud procedure that they would follow during the main task. Prior to both tasks subjects were asked to read aloud instructions which were presented to them on the computer screen (Appendix A). Upon completing the main task, subjects were asked to make a summary assessment of the case.

Experimental Manipulation

Two versions of the case file were utilized. In version one, the first portion of the case file comprised information that was *primarily* contextual in nature. This was followed, in the second portion of version one, by information that was *primarily* dispositional in nature. The content of version two was identical to the content of version one. However, in version two the client information was in the reverse order to version one. In version two, information of a *primarily* dispositional nature was presented in the first portion. This was followed, in the second portion of version two, by information of a *primarily* contextual nature. After subjects were designated as psychodynamic/low-experienced, psychodynamic/high-experienced, cognitive-behavioral/low-experienced, and cognitive-behavioral/high-experienced, they were randomly assigned to one of the two versions of the case file.

Data Coding

The coding categories for inferences posited while reading the case file were as follows: (1) preliminary dispositional, (2) preliminary contextual, (3) confirmatory dispositional, (4) confirmatory contextual, (5) disconfir-

matory dispositional, and (6) disconfirmatory contextual. The following categories were used for inferences stated during a summary assessment that followed the reading of the text: (1) preliminary dispositional, (2) preliminary contextual, (3) retain dispositional, (4) retain contextual, (5) reject dispositional, and (6) reject contextual. Finally, there were two additional categories, (1) unclassifiable and (2) non-inferential. An interrater reliability of .95 was achieved, monitored, and maintained throughout.

Design

A quasi-experimental analogue, 2 X 2 X 2 factorial design (Cooke & Campbell, 1979) was employed. The between-subjects factors are: (1) theoretical orientation, (2) level of experience, and (3) case file version. Each factor has two levels: (1) psychodynamic versus cognitive-behavioral/behavioral; (2) low-experienced versus high-experienced, and (3) version 1 versus version 2, respectively.

Results

Attribution

Proportion of dispositional inferences to total inferences. There are strong theoretical grounds for thinking that psychodynamically-oriented clinicians would be more likely to attribute presenting problems to characterological aspects of the client (that is, dispositions) than would behaviourally-oriented clinicians. When analyses of variance were undertaken to examine the *proportion of dispositional inferences to total inferences* , no significant difference was found for psychodynamicists and behaviourists, $F(1,24) = 2.47$, $p = 0.129$. An examination of the summary data for the proportion of dispositional inferences to total inferences, presented in Table 1, reveals the following: of the total number of dispositional and contextual inferences posited by psychodynamicists and behaviourists, 77% and 81% are dispositional in nature, respectively. Conversely, 23% and 19% are contextual in nature, respectively.

The total number of dispositional and contextual inferences posited by psychodynamicists and behaviourists is presented in summary Table 1. Psychodynamicists make more inferences than behaviourists ($M = 129.13$, $M = 95.63$, respectively). However, it can be seen that both psychodynamicists and behaviourists draw more dispositional ($M = 98.13$, $M = 78.31$, respectively) than contextual ($M = 31.00$, $M = 17.31$, respectively) inferences. Psychodynamicists drew an average of 67.13 more dispositional inferences than contextual inferences. Behaviourists made an average of 61.00 more dispositional inferences than contextual inferences.

TABLE 1

Means for the Dependent Variates Used to Measure the Dependent Variable, Attribution, for the Main Effect of Theoretical Orientation

Dependent Variate	*Theoretical Orientation*	
	Psychodynamicists	*Behaviourists*
Dispositional Total	98.13	78.31
Contextual Total	31.00	17.31
Disp-Cont Total	129.13	95.63
Disp Proportion	0.77	0.81
Cont Proportion	0.23	0.19

Note. Disp = dispositional, Cont = contextual.

Dispositional and contextual inferences: Absolute number. The question concerning the tendency among psychodynamicists and behaviourists to attribute client problems to trait (dispositions) or state (context) was answered by examining the frequency of dispositional and contextual inferences based on absolute number only. An analysis of the *absolute number of contextual inferences* reveals that the null hypothesis may be rejected for inferences of a contextual nature, $F(1,24) = 6.33$, $p = 0.019$. Psychodynamicists posited more contextual inferences in absolute number ($M = 31.00$) than behaviourists ($M = 17.31$) (see Table 1). Surprisingly, psychodynamicists are more likely than behaviourists to attribute client problems to external factors. The analysis of variance reveals that there was no significant difference in the *absolute number of dispositional inferences* posited by psychodynamicists and behaviourists, $F(1,24) = 1.81$, $p = 0.19$. Interestingly, clinicians of either orientation are not more likely to attribute client problems to characterological traits. Evidently, whether clinicians are psychodynamically-oriented or behaviourally-oriented significantly affects the relative number of contextual inferences they posit about their clients' problems, but may not affect the relative number of dispositional inferences.

Results based on absolute numbers need to be interpreted with caution. The significant differences based on absolute numbers may be a function of the greater number of overall inferences posited by psychodynamicists than behaviourists. If psychodynamicists infer more in total, the likelihood that they attribute client problems to both trait and state increases as well.

Further, analyses revealed no significant difference in levels of dispositional or contextual inferences as a function of any interactions of the factors, irrespective of how they were calculated. Finally, analyses

revealed that the main effects for level of experience and for temporal order did not account for significant differences in levels of dispositional or contextual inferences, irrespective of how they were calculated.

Hypothesis-Testing Strategies

Preliminary dispositional and preliminary contextual inferences: Absolute number. It was of interest to examine the ways in which clinicians behave (eg. the hypothesis-testing strategies they utilize) when examining a case file. Clinicians begin by putting forth a hypothesis about client problems; this was referred to as a preliminary inference. The preliminary inference can bear on a trait or bear on a state. In view of this, another set of analyses (see Figure 1), pertaining to *preliminary dispositional* and *preliminary contextual* inferences, indicates that the absolute number of preliminary contextual inferences varied significantly as a function of the two-way interaction of theoretical orientation and level of experience, $F(1,24) = 4.22$, $p = .051$.

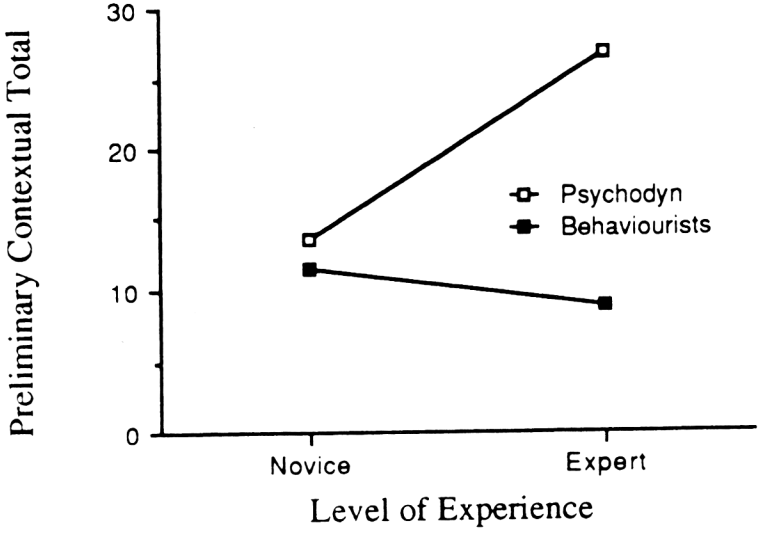

Figure 1. Preliminary contextual inferences posited as a function of the two-way interaction of theoretical orientation and level of experience.

That is, the number of preliminary contextual inferences posited by clinicians, from both schools is not the same when seen together with level

of experience. Among psychodynamicists, experts (M = 26.75) stated many more preliminary contextual inferences than novices (M = 13.63). Similar results, however, were not found for behaviourists. Expert-behaviourists (M = 8.88) stated fewer preliminary contextual inferences than novice-behaviourists (M = 11.50). Further, it is observed that the difference in the number of preliminary contextual inferences put forth by novice behaviourists (M = 11.50) and expert behaviourists (M = 8.88) is negligible. Whereas expert-psychodynamicists are more likely, at the outset, than novice-psychodynamicists, to attribute client problems to environmental stressors, expert-behaviourists are less likely, at the outset, than novice-behaviourists, to attribute client problems to environmental stressors.

It can also be noted (see Figure 1) that both novice and expert psychodynamicists posited more preliminary contextual inferences than both novice and expert behaviourists. Careful examination of the descriptive data shows that novice-psychodynamicists (M = 114.63) and expert-psychodynamicists (M = 143.63) stated more inferences in total than novice-behaviourists (M = 108.63) and expert-behaviourists (M = 82.63). Again, the limitations of results based on absolute numbers apply.

Proportion of confirmatory dispositional to total dispositional inferences. After putting forth initial hypotheses about client problems, clinicians develop these ideas by picking up on information that either confirms or disconfirms their preliminary hunches. Again, these follow-up hypotheses about client problems can be conceptualized as long-term intrapsychic or environmental problems. Results of an analysis of variance pertaining to the *proportion of confirmatory dispositional to total dispositional inferences* indicate that the proportion of confirmatory dispositional inferences varied as a function of level of experience, $F(1,24) = 4.13$, $p = .053$. Of the total number of dispositional inferences, novices posited more confirmatory dispositional inferences than experts. These results reveal that recently-trained clinicians tend more than experienced clinicians to generate data that prove their initial trait hypotheses correct. These findings provide partial evidence for the research on hypothesis-confirmation (Merton, 1957; Scheff, 1966; Skrypnek & Snyder, 1982; Snyder, Tanke, & Berscheid, 1977). In this study, results, based on results: absolute number as distinguished from proportional figures, pertaining to confirmatory dispositional inferences, did not yield significance for any of the independent factors. However, the results revealed that level of experience did significantly affect the results:proportion of confirmatory dispositional inferences to total dispositional inferences posited by clinicians. Novices are more apt than experts to confirm their preliminary dispositional inferences. The evidence adduced supports the notion that counsellors do engage in

hypothesis-confirmation strategies by seeking validation for their first-adopted opinions.

Proportion of confirmatory contextual to total contextual inferences. Another analysis examined the confirmation of hypotheses that attribute client problems to environmental stressors. Results of an analysis of variance indicate that the *proportion of confirmatory contextual to the total number of contextual inferences* varied as a function of temporal order of information, $F(1,24) = 5.65$, $p = .025$. When presented with contextual information first, forty-four percent of the clinicians' inferences were confirmatory contextual. When presented with dispositional information first,twenty-six percent of the clinicians' inferences were confirmatory contextual. This result points to a primacy-recency effect. The order in which client information is presented did affect the proportion of confirmatory contextual inferences to the total contextual inferences posited by clinicians.

It appears that clinicians do engage in hypothesis-confirmation behaviour as a function of the order in which client information is presented. They tend to confirm their inferences that attribute the problem to the environment when they are presented with contextual followed by dispositional information. The types of inferences they confirm are affected by the sequencing of client information. This finding supports the research positing that temporal order of information influences the judgements of clinicians (Anderson, 1965; Asch, 1946;Jones, Rock, Shaver, Goethals, & Ward, 1968; Pain & Sharpley, 1988, 1989; Richards & Wierzbicki, 1990). This implies that clinicians need to pay close attention to the type of information clients present during the first interview. If clients present with primarily information of a situational nature first and then move on to primarily information of a characterological nature, clinicians tend to confirm proportionally more contextual inferences than if clients present with primarily information of a characterological nature first and then move on to primarily information of a situational nature.

Disconfirmatory inferences: Proportion and absolute number. While developing their diagnostic impressions, clinicians may retract or disconfirm their initial hypotheses of one type or another (eg. dispositional or contextual). Results indicate that no significant differences were found in the *proportion or the absolute number of disconfirmatory inferences to the total number of inferences* as a function of any of the factors. The descriptive data indicate that clinicians disconfirm only 12 to 14% of their total number of inferences across the independent variables, a strikingly small proportion indeed.

According to the literature on hypothesis disconfirmation, individuals prefer to strengthen their expectancies. They tend to utilize occurrences

and underutilize nonoccurrences (Croxton, 1989; Lord, Ross, & Lepper, 1979; Shustak & Sternberg, 1981; Snyder & Cantor, 1979). In light of the findings reported in the literature, it is not surprising that significant differences pertaining to disconfirmatory inferences were not found for any of the independent variables in this study. The implication is that clinicians-in-training need to become aware of the often unwarranted tendency to hold on to their preliminary inferences. In view of this tendency, professionals in training institutions might do well to draw attention to the *stickiness* of first-posited inferences. They are not likely to be discarded, irrespective of theoretical orientation, level of experience, or temporal order.

Final Diagnostic Operations

Dispositional and contextual inferences to total inferences posited during the summary: Proportion and absolute number. It was of interest to examine the types of concluding or final inferences made by clinicians. The findings indicate that the theoretical school to which clinicians subscribe affects the proportion of dispositional inferences to total inferences posited during the summary, $F(1,24) = 5.12$, $p = .033$. Of the total number of final inferences posited, 93% of behaviourists and 82% of psychodynamicists were dispositional.

Results based on absolute numbers indicate that theoretical orientation marginally accounted for variance in the number of contextual inferences, $F(1,24) = 3.95$, $p = .058$. During the summary, psychodynamicists ($M = 3.31$) more often than behaviourists ($M = 1.25$) attribute client problems to environmental stressors.

In addition, *the proportion of dispositional inferences to total inferences posited during the summary* varied as a function of temporal order $F(1,24) = 4.13$, $p = .053$. Ninety-three percent of the inferences stated by clinicians presented with contextual information first were those that attributed presenting problems to characterological aspects of the client. Eighty-two percent of the inferences made by clinicians presented with dispositional information first were those that attributed presenting problems to characterological aspects of the client. During the final diagnostic assessment, the tendency among clinicians to attribute client problems to dispositions appears to be a function of the specific order of information, that is, contextual information followed by dispositional information.

Inferences retained: Absolute number. During the concluding stages of the assessment process, do clinicians tend to retain inferences that attribute client problems to trait or state? Results reveal that the absolute number of dispositional inferences retained varied as a function of the interaction (see Figure 2) between theoretical orientation and temporal order of

information, $F(1,24) = 5.39$, $p = .029$. The descriptive data indicate that psychodynamicists presented with contextual information first ($M = 12.75$) retain more inferences that attribute client problems to trait than psychodynamicists presented with dispositional information first ($M = 9.13$). Behaviourists presented with dispositional information first ($M = 14.38$) retain more inferences that attribute client problems to trait than behaviourists presented with contextual information first ($M = 8.25$).

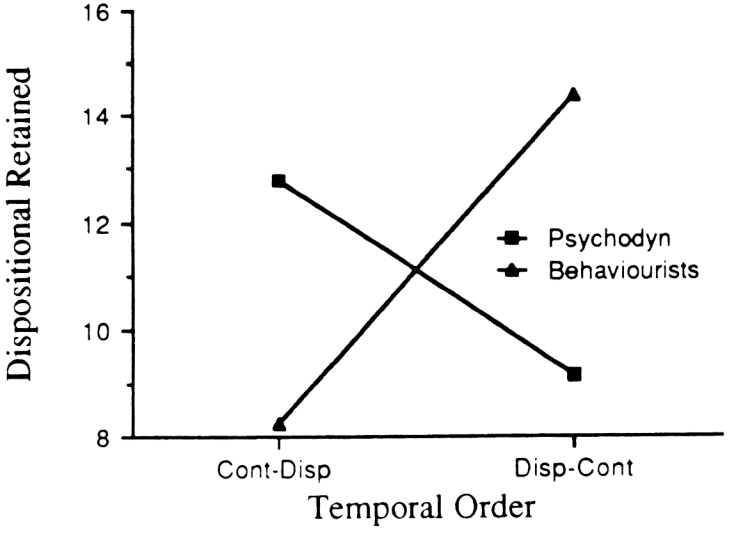

Figure 2. Dispositional inferences retained as a function of theoretical orientation and temporal order.

Relative to the above result, it appears that an inverse relationship exists for theoretical orientation and temporal order of information. Psychodynamicists retain more inferences that are attributed to trait when they are presented with contextual information first than when they are presented with dispositional information first. However, results found for behaviourists are in the opposite direction. Behaviourists retain fewer inferences that are attributed to trait when they are presented with contextual information first than when they are presented with dispositional information first.

In addition, analysis of variance indicates that the absolute number of contextual inferences retained varied as a function of the main effect of theoretical orientation, $F(1,24) = 5.08$, $p = .033$. However, an analysis of

dispositional inferences retained revealed no significant differences for theoretical orientation, $F(1,24) = 0.03$, $p = .859$. Psychodynamicists (M=2.63) retained more contextual inferences than behaviourists (M = 0.69).

The results for level of experience indicate that the absolute number of dispositional inferences retained varied as a function of level of experience, $F(1,24) = 5.96$, $p = .022$. Novices ($M = 13.69$) retained more dispositional inferences than experts ($M = 8.56$). This result is related to the previous significant finding concerning the proportion of confirmatory dispositional inferences to the total preliminary and confirmatory inferences for novices, $F(1,24) = 4.13$, $p = .053$. Novices not only confirmed more of their preliminary dispositional inferences than experts, they also retained more dispositional inferences than experts.

Inferences rejected: Absolute number. Do clinicians finally rescind their initial hypotheses? If so, do they tend to cancel one type, that is, those that are dispositional or contextual, more than another? The results indicate that none of the factors accounted for variances in the number of dispositional and contextual inferences rejected. Apparently, whether clinicians are psychodynamically-oriented or behaviorally-oriented, novice or expert, and process contextual or dispositional information first does not affect the absolute number of dispositional and contextual inferences rejected. Once established, clinicians tend not to annul their initial hypotheses of either type.

Summary of Results

1. No significant difference was found in the proportion of dispositional inferences to total inferences for psychodynamicists and behaviourists, $F(1,24)=2.47$, $p = 0.129$.

2. Psychodynamicists posit more contextual inferences in absolute number than do behaviourists, $F(1,24)=6.33$, $p = .019$.

3. No significant difference was found in the absolute number of dispositional inferences posited by psychodynamicists and behaviourists $F(1,24)=1.81$, $p = 0.19$.

4. The absolute number of preliminary contextual inferences varied significantly as a function of the two-way interaction of theoretical orientation and level of experience, $F(1,24)=4.22$, $p = .051$. Expert-psychodynamicists posit many more preliminary contextual inferences than novice-psychodynamicists. Expert-behaviourists posit fewer preliminary contextual inferences than novice-behaviourists.

5. Novices posit more confirmatory dispositional inferences than experts, $F(1,24)=4.13$, $p = .053$.

6. The order in which client information is presented significantly affects the proportion of confirmatory contextual inferences to the total contextual inferences posited by clinicians, $F(1,24) = 5.65$, $p = .025$.

7. No significant differences were found in the disconfirmatory inferences (either proportionately or in absolute terms) of a dispositional or contextual nature as a function of any of the factors.

8. The theoretical school to which clinicians subscribe affects the proportion of dispositional inferences to total inferences posited during the summary, $F(1,24)=5.12$, $p = .033$. Behaviourists posit a greater proportion of inferences that are dispositional than do psychodynamicists.

9. During the summary assessment, and based on absolute numbers, psychodynamicists more often than behaviourists attribute client problems to environmental stressors, $F(1,24)=3.95$, $p = .058$.

10. The proportion of dispositional inferences to total inferences posited during the summary varied as a function of temporal order, $F(1,24)=4.13$, $p = .053$.

11. The absolute number of dispositional inferences retained varied as a function of the interaction between theoretical orientation and temporal order of information, $F(1,24)=5.39$, $p = .029$. Psychodynamicists presented with contextual information first retain more inferences that attribute client problems to traits than psychodynamicists presented with dispositional information first. Behaviourists presented with dispositional information first retain more inferences that attribute client problems to traits than behaviourists presented with contextual information first .

12. Psychodynamicists retain more contextual inferences than behaviourists, $F(1,24)=5.08$, $p = .033$.

13. Novices retain more dispositional inferences than experts, $F(1,24)=5.96$, $p = .022$.

14. None of the factors accounted for variances in the number of dispositional and contextual inferences rejected.

The above results indicate that theoretical orientation, level of experience, and temporal order of information differentially affect the types of inferences (namely, dispositional and contextual), the hypothesis-testing strategies (namely, preliminary, confirmatory, and disconfirmatory), and the final diagnostic operations utilized by clinicians (namely, initiate, retain, and reject). These findings have important implications for counsellor education and are discussed below.

DISCUSSION: IMPLICATIONS FOR COUNSELLOR TRAINING

People act on their beliefs. But they hold to those beliefs with more confidence than the empirical basis for them warrants. This is as true in scientific as in philosophical, political, or religious domains. The emotion that atomic scientists or medical geneticists invest in their theories and the strident, public disputes they engage in attest to this. It is not surprising that the field of counselling and psychotherapy has been the scene of similar emotional debates. Most of the discussions go on with little acknowledged consideration of the cognitive limits of certitude in the positions held. Clinicians practice as if their theoretical models of human development were truthful representations of the world rather than tentative and inherently obsolescent models that were vulnerable to radical improvement if not rejection. Students and trainees are no less prone to partisanship than are their teachers or, for that matter, expert clinicians who after 30 years of practice hold tenaciously to the paradigm, hardly altered, that they learned in graduate school.

Probabilistic Disciplines

Although most branches of psychology are, unlike mechanics, optics, and other specialties of physics, highly probabilistic disciplines, our counsellor—trainees tend to treat them as natural sciences. Further, most students coming from an undergraduate program in psychology do not know the basic principles of drawing logical inferences from data. It is for this reason that it is advisable to spend the initial weeks of a year-long theories course at the masters level on the philosophy of science. It is useful to go into some basic principles of logical reasoning, with special emphasis on *modus ponens* and *modus tollens,* two operations for testing hypotheses. The way and the extent to which these principles are violated in both research and practice, and the faulty heuristics that are commonly used in solving problems could be the basis for a year-long course. The authors of this article spend perhaps 6 to 9 class hours on these issues, just enough to create a healthy scepticism about the conclusions one draws about even the most mundane matters.

When Is a Fact a Fact?

Related to this issue is the even more fundamental matter of understanding when one has truly made an inference. One makes inferences, of course, without always being fully aware of it. Clinicians can implicitly assume a condition to exist though there are only tenuous reasons for believing it. Even when theoreticians begin with a speculation, once they have rehearsed it often enough, it can assume the character of

a fact. It is then no longer questioned. It may be that ideological or religious notions that young children hear and rehearse hundreds of times in their childhood and youth assume the quality of incontrovertible facts in the same way.

The authors of this paper have found that most entering students in their programs have some difficulty distinguishing facts from near-facts or factoids. Any clinical program could usefully incorporate some training in placing information as well as conclusions from it on a continuum of credibility.

Exploring the Psychology of Theory-building

Each counsellor reading this text has probably made a choice of a theory of counselling or psychotherapy and is governed in practice by the constraints of that theory. Although some have chosen to be eclectic in their practice, they are thereby led into some contradictions by virtue of the fact that the underlying principles of some systems are incompatible and irreconcilable. It is difficult to be existentialist, in which one assumes that clients have a free will and are influenced their entire life by the cultural, social, economic dynamics of the society in which they live, and at the same time psychoanalytic, in which one assumes that people are shaped by forces that can be characterized as deterministic, historical, instinct-driven, unconscious, and pansexual. A brief examination of the difficulties of working simultaneously within two conflicting frames of reference will repay the effort. This is, in our view, a useful component of a training module in any of the mental health and helping professions.

It is useful to look at the work of Feyerabend, Lakatos, Mannheim, Kuhn, and others who explore the way professionals cling tenaciously to paradigms, even in the face of seriously disconfirming facts and research. That there is not a sound empirical foundation for much of what is practised is something that needs to be explored with trainees. There are hundreds of different therapies, all of which have their ardent apologists and practitioners. Each professional practices the one of his or her choice without thinking of the many other ways in which the client could have been treated by colleagues who were inducted into other belief systems. We cannot afford to give this too much thought as it would tend to immobilize us.

The Value of Tentativeness

Trainees need to be indoctrinated in the notion that a diagnosis is always vulnerable to disconfirmation. Determining how to do this is still a challenge. The research literature indicates that practitioners have the

tendency to form a definitive judgement as soon as they find one cue, one fact that fits their theoretical schema. A friend of one of the authors said that he had had a heated argument with his father when he was 14-years old. "Aha—unresolved oedipal conflict" was the response. The therapist magnified the importance of that incident and repeatedly injected it in other matters. That client datum needed to be tested before it was reinforced. The event fit nicely into the therapist's theoretical template. It may as a result have been given an importance it did not deserve — if one assumes that the construct, oedipal conflict, has value to begin with.

Single-cause Etiologies

The human psyche is a resultant of innumerable life experiences overlaid on a complex physiological substrate. Out of those myriad and powerful factors, all of which have interacted to form the personality of the individual in treatment, it seems unlikely that there is one alone that can explain a pattern of behaviour whatever. One-trial learning does occur in a Skinner box or a dog cage — and that with a powerful aversive stimulus. It no doubt has happened in uncontrolled human experience; it should not however, be presumed to have happened in one's client. Students must be trained not to stop their search when they have found what they think is a sufficient cause of a problem, but to seek more complete explanations, if indeed, explanation is what one wants. Looking for a "universal pathogen" is a lure. It leads one to overlook medical, familial, recreational, cultural, vocational, dietary, and financial-economic factors. It is doubtful that one can adequately account for a psychological disorder by alluding to one cause. Workshop components and practica within masters and doctoral programs could usefully integrate exercises and lessons that address this issue.

Contextual and Dispositional Variables

People who enter counselling programs are almost by definition psychologically-minded. The human mind fascinates them. The liability in this virtue is that they, and perhaps their instructors, focus so intensely on the mind that they lose sight of the circumstances, very often terrible circumstances, that precipitate and maintain disorders. Assume for purpose of argument that all people are prepsychotic in the sense that it only requires the proper and sufficiently intense application of stressors to precipitate a breakdown. In that sense, all nonorganic disorders are post-traumatic stress disorders. The possibility that this is true should, by itself, lead practitioners to routinely begin an assessment by examining the actual contextual forces that press upon their clients. To overlook these leaves

counsellors with a truncated and distorted assessment of their clients' condition.

There is ample evidence that clinician-observers are prone to explain the behaviour of anyone they are clinically observing by alluding to intrapsychic rather than contextual variables. Cases rich in situational material as well as dispositional material need to be presented to students so that they may be trained to assess the impact of environment on their clients' behaviour and emotional health.

Developing Etiologies

Flowing from the above is a recommendation that students be trained to develop two or more alternative etiologies for complex case histories which they have been given to analyze. One etiology could be predominantly contextual in character. The other, intrapsychic. Following this they could be blended, integrated into a coherent and balanced one. On the other hand, etiologies can represent two or more distinct therapeutic orientations for dealing with a psycho-emotional disorder. Students can be required to formulate two such assessments; in a second moment they could be asked to integrate them in one (or more) balanced and plausible formulations with a treatment approach appropriate to each.

To implement a training module of this kind would require professors and mentors on academic staff who were individually expert in different schools of counselling, different treatment modalities, and different fields of counselling, not least vocational and developmental.

Some Heuristics

Vividness. There are a number of heuristics that operate out of awareness and are simple-mindedly applied by novices and experts alike in solving problems. One of the best documented of these is that we give more importance to factors that are concrete, vivid, pungent, humorous, absurd, or flamboyant than to those that are pedestrian, prosaic, and pallid. Because an incident is vivid and memorable does not make it intrinsically more pertinent than, let us say, a data set of omissions by a negligent spouse. Trainees need to be instructed and rehearsed in this important principle.

This is not unrelated to the fact that clients provide an abundance of self-serving details and incidents that are vivid and repeated. Clients may not be fully aware of their need to protect their self-esteem (a laudable objective *in se*) by giving a more florid explanation of their problems and their origins. Emphasis may need to be given to discriminating among clues relative to their contribution to client problems.

Statistical mindsets. People generally are insensitive to the prior probability of outcomes in which they are interested. They are prone to infer spurious correlations between antecedent *A* and consequent *B*, which they have observed, with little consideration of the probability that *B* would have occurred in any event. In short, they ignore baseline data. They do not search out, even superficially, other plausible if less likely explanations for a symptom or an outcome. A study of this error within the context of a practicum might be rewarded by a later reduction of its incidence in professional practice.

The same must be said of students' insensitivity to sample size. Before, let us say, choosing an academic course, or school, or profession, or airline, or neighbourhood to live in, it would be wise to consult with two or more people who have already had experience with them. Most people are not aware of the power of seeking three opinions over one opinion. It is good to lead students through a series of exercises in which they will be sensitized to the power of sample size for either enhancing or reducing probability of error.

There are other procedural biases that clinicians are prone to make, still more so, students and layfolk. Surprisingly, there is little evidence that many university training programs address these sources of clinical misjudgment. There will be much more said about this in the future.

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APPENDIX A

Instructions

I am about to present a case file to you with information gathered during the first interview. The material you will read has not yet been organized into the traditional clinical assessment format nor is it necessarily complete. I am interested in your assessment of the problems that this client has presented with. I would like you to assess the case in the same manner as you do when an individual is referred to you in your practice, utilizing the criteria, for example the DSM III-R or others, that you are accustomed to. I would like you to read the material that is presented on the computer screen aloud and tell me everything that comes to your mind, no matter what it is, the moment the thoughts occur to you. This may be mid-sentence, at which point please feel free to stop and tell me what you are thinking. I would ask you, however, to stop at least at the end of every sentence so that you can think aloud. You may return to any portion of the file whenever you wish to. When you do, please continue to read and think aloud. When you reach the end of the case file, I would ask you to formulate and suggest your diagnostic impressions as well as one or two differential diagnoses.