The Journal of Sociology & Social Welfare

Volume 15
Issue 1 *March*

Article 9

March 1988

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Computers are being introduced into practically every area of clinical practice. The use of this technology by practitioners has not gone unchallenged. Specifically, new ethical problems are thought to be associated with using computers to make clinical assessments. Logistical and procedural difficulties, however, have been the primary focus of concern. In this paper the critique of computerized evaluation is expanded, with attention directed to the computer "micro-world." Because the computer micro-world consists of several unwarranted assumptions about the nature of social reality, clinical practice may be affected in many undesireable ways. The theoretical underside of computer use is illustrated to show how it shapes therapeutic (or diagnostic) discourse.

Technology is proliferating in every area of society, including clinical practice. Computer programs are now available that conduct intake interviews, administer, score, and interpret clinical instruments, monitor treatment plans, and engage clients in actual therapeutic discourse (Murphy and Pardeck, 1986c; Pardeck, 1988). Many practitioners believe that these developments will improve the delivery of clinical services. They contend that because this technology performs most activities faster and more accurately than humans, patient care is more effective. Because clinical software packages are unaffected by human judgements, the claim is made that diagnoses and correctives free from error can be provided (Pardeck and Murphy, 1986).

This use of technology in clinical settings, however, has not gone unchallenged (Murphy and Pardeck, 1986a; Murphy and

Pardeck, 1986d). One of the most sophisticated critiques of this trend has been formulated by Matarazzo (1986). This paper should be viewed as an attempt to build upon his work. Nonetheless, he neglects an area of concern that deserves serious attention. A key shortcoming of his analysis is that technology is portrayed to be a tool, which may be used either correctly or incorrectly. His approach overlooks an important finding by researchers in the area of artificial intelligence (AI) that suggests computer technology should not be conceptualized in this manner. Simply put, Matarazzo ignores the problems that Jacques Ellul (1964) claims are associated with the "technological ethic." By doing this, the subtle ways in which the logic of data processing may alter clinical practice cannot be fully appreciated.

Technological Ethic and Computer Micro-World

Modern writers contend that computers do not operate on the basis of technical knowledge alone. What this means is that computers are not value-free, contrary to the view held by many practitioners. In fact, in order for computers to process information effectively, particular theoretical assumptions must be accepted as valid. Taken together, these philosophical principles constitute what writers such as Marvin Minsky and Seymour Papert (Dreyfus, 1979) call the computer "micro-world."

The introduction of this construct into the study of computers is quite revolutionary. For example, computers must now be understood to supply their own data selection guidelines, and thus data processing is not "value free." Computers are not merely receptacles into which data are placed, but play an active role in conceptualizing various aspects of social life. Most important, as illustrated by Hubert and Stuart Dreyfus (1986), the computer micro-world is able to create the illusion that computers generate information untrammeled by situational exigencies. Speaking facetiously, Ashley Montague states that the GIGO principle has come to mean "garbage in—*gospel* out" (Roszak, 1986, p. 120). Computer-produced knowledge, in other words, is commonly accepted to embody pure reason, unadulterated by interpretation.

The computer micro-world, because it is sustained by judgements that are presumed to be universally acceptable, is

able to lull persons into believing that opinion can be separated categorically from fact (Murphy and Pardeck, 1986b). To quote Guattari (1984, p. 114), the process of computerization introduces the "differentiators" necessary to reinforce the usual distinction made between subjectivity and objectivity. This demarche is accomplished by defining key aspects of both social existence and the clinical milieu in technical terms.

Basic to the computer micro-world are three rubrics. First, all phenomena are transformed into material objects. Second, mathematics is adopted to provide these entities with an identity. And third, natural laws are assumed to sustain both natural and social facts. What this means, for example, is that persons are identified with their demographic characteristics, specific symptoms are indicative of illness, and making a diagnosis is equated with classifying traits. As Lyotard notes (1984, p. 4), knowledge is transformed into "quantites of information." Judgements become technical operations, thereby suggesting that diagnoses and other clinical activities are scientific. Information, stated simply, is reified, because certain beliefs about the world are accepted unquestioningly as valid. These tenets constitute the computer micro-world.

Ellul demonstrates how the introduction of technology creates the illusion that persons can control practically any process more thoroughly than ever before. Most problematic, whenever possible the increased use of high-tech instruments is encouraged, in order to formalize tasks. Subsequent to translating cognitive operations into technical terms, for example, any activity can be organized according to exact calculations. Because the implementation of technical criteria allegedly does not require interpretation, objective or unbiased assessments are deemed possible. Technical competence thus becomes the cornerstone of clinical practice. Yet in order to appreciate how this legerdemain is perpetrated, the impact of the computer micro-world must be examined further.

When developing software packages, the assumption is made that persons are "rule-following, symbol-manipulating, rational beings" (Dreyfus and Dreyfus, 1986, p. 123). Evident in this description is the dualistic nature of language. Symbols are manipulated, thus suggesting that they exist independent of human

intentions. Therefore, facts are stripped of their interpretive meaning and easily classified. In point of fact, presupposed by computerization is that symbols represent ""context-independent, objective features of the real world" (Dreyfus and Dreyfus, 1986, p. 53). If this were not the case, information could never be introduced into a computer.

Stated otherwise, language must be transformed into a system of "digitalized signs" (Guattari, 1984, p. 87). This occurs when the sign and signifier are imagined to be isomorphic. Thus language does nothing more than "point to," "indicate," or "describe" something other than itself (Mitchell, 1986). As Jacques Derrida (1973, p. 138) writes, speech "defers" to factors that are allegedly more fundamental than linguistic acts. Most relevant to this discussion, data are treated as inert objects, or "input," that can be made to conform readily to the logistical demands imposed by computer programs. With this in mind, Jean-Francois Lyotard (1984, p. 86) declares that the appropriate unit of knowledge in the so-called Computer Age is the information "bit." As suggested earlier in this discussion, these bits of information are objectified and treated as an indubitable source of knowledge. This view is criticized by Theodore Roszak (1986, pp. 108–134) when he writes that computers deal with idealized knowledge.

Computers can process information only when data are divorced from situational contingencies and, thus, unambiguous. These machines regulate effectively how symbols are used by requiring that data fit neatly into the "conceptual digits" adopted by computer programs to classify input. According to J. David Bolter (1984, pp. 83–90), each piece of information is assigned an "address space" into which it must be placed. Because data are treated in this way, Hubert Dreyfus (1972, pp. 235–255) charges that computerization "disembodies" information, for knowledge is deprived of the interpretive qualities that provide it with a human character. Therefore, Margaret Boden's (1977, pp. 15–17) claim that computers do not "crunch" numbers, but, more important, specify how symbols may be utilized, should not startle anyone. But how does this change in thinking about computers affect clinical practice?

Technology and Clinical Practice

Suggested by the use of computers is that knowledge can be severed from its interpretive context, without any appreciable loss of meaning. In other words, transforming clinical information into measurable quantities is not necessarily disruptive. Yet social phenomena defy this simplistic form of analysis. Facts are not unambiguous and easily classified, unless these phenomena are misconstrued and mistreated. Imbued with interpretation, clinical data must be approached sensitively, or their social significance will be lost. The interpretive importance of facts, in other words, must be grasped, if a relevant diagnosis is to be generated. However, this sort of sensitivity is not essential to the success of computerization. Central to the use of computers are formal logic and the categorization of input.

Murphy and Pardeck (1985) maintain, accordingly, that computers convey imagery that "deanimates" the clinical setting. Due to the emphasis that is placed on formalization, computerization is accompanied by a belief in realism. Sometimes this viewpoint is referred to as "instrumental realism" (Ihde, 1979). Although Matarazzo recognizes that computers unduly objectify data, the rationale he invokes to support this observation is unclear. By introducing the notion of instrumental realism, this fault in his argument can be rectified. Simply put, the computer micro-world is *designed* to objectify events, and thus, as Matarazzo notes, clinical evaluations are equated with testing rather than assessment.

Tests produce findings, while assessments are more encompassing and include the element of human sensitivity. Assessments, in other words, are not based solely on technical criteria. Nonetheless, the presumption that the use of tests can be equated with the generation of high quality data is believed to be entirely justified. When technologically mediated, every facet of a clinical setting is defined in such a way that testing is viewed naturally to produce high quality information. The process whereby computerization encodes patients constitutes the social component of the technological ethic. As described by Guattari (1984, pp. 135–143), a patient's behavior is envisaged to be "subjectless action." Actually, what is most problematic about technologically

mediated therapy is the assumption that diagnoses should be objectified. Therefore, the following considerations must be addressed by anyone who incorporates computers into clinical practice, for the application of the computer micro-world to analyzing social affairs is thought to be suspect:

1. In any theory of ethics the issue of epistemology must be addressed, for truth provides the foundation of social order. Therapeutic discourse must be based on norms, or facts, that apply to both therapists and patients. Yet computerization demands that facts be treated as if they are thing-like, as required by the logic of data processing. While those who use computers can manipulate data in almost unlimited number of ways, each piece of information can have only a single identity. Nonetheless, are facts this obtrusive? Modern writers argue that reality is derived from "language games (Lyotard, 1984). Jacques Lacan (1977, p. 306), for instance, insists that truth originates from speech, not reality. Their point is that health and illness are not natural states, but behaviors that have linguistic meaning. The "effective procedures" used by computers to regulate client-therapist interaction, however, are not intended to accomodate the linquistic side of facts. Hence the interpretive nature of a diagnosis is minimized, thereby obscuring the social dimension of a client's problem.

2. Considering the image of knowledge indigenous to computerization, no-one should be surprised that facts unmolested by opinion are believed to hold the key to a valid diagnosis. A patient, therefore, must be treated as having traits similar to anyone who has the same malady. But, as recognized by Matarazzo, an identical test profile does not necessarily have the same meaning for every client. When diagnoses are guided by axiomatic principles, however, such a finding suggests the presence of human error. The possibility that a particular symptom may be understood in a variety of ways, depending on cultural or other interpretive factors, is ignored. This omission is what the Dreyfuses (1986, p. 76) have in mind when they state that "expert systems" are internally consistent, but oblivous to the world. As a result, each client is approached erroneously as a "typical" case.

3. When knowledge is objectified and data collection dean-

imated, clinical judgements are often based on information that may not be relevant. Because computerization idealizes one type of information, while diminishing the importance of others, data derived from technical procedures are assumed to be most germain to making a diagnosis. Moreover, Kleinmuntz (1984) suggests that reduced reliance on intuitive insight will probably improve the accuracy of clinical judgements. Yet as diagnostic skill comes to be equated with technical competence, the *art* of intervention begins to atrophy. Clinicians may begin to focus on methodological and procedural concerns, rather than relevant situational considerations that differentiate reality from illusion. And when technical standards are not socially paramount, modes of behavioral classification that are primarily technically based are reductionistic. This sort of reductionism is prevalent when so-called "soft" information is treated automatically as ancillary to quantitative data. Such myopia may invalidate altogether the diagnostic process, for the linquistic significance of behavior cannot be easily circumscribed.

4. Giving "calculative rationality" primacy when making a diagnosis tends to engender a particular type of relationship between client and therapist (Dreyfus and Dreyfus, 1986, pp. 163–167). Furthermore, this style of interaction may not be fruitful, because, using Michel Foucault's (1973, pp. 163–167) terminology, the therapist's gaze is "mathematized." By this he means that clinical discourse is reified. For instance, a client must be approached objectively, for otherwise a clinician's judgements will be sullied by nonempirical elements. Therefore, a patient is assumed to represent a composite of facts, and thus can be examined as simply another "case." As Martin Buber might say, the client and therapist are encouraged to address each other in an "I-it" manner, or stated otherwise, as objects to be manipulated (Murphy, 1983).

Yet how valid can a diagnosis be when a client and therapist do not respect each other? In a now classic statement, Joseph Weizenbaum (1976, p. 270), creator of the interactive program ELIZA, declares that respect is not a technical issue. With this remark he is criticizing those who maintain that therapy can or should be computerized. For without interpersonal sensitivity how can persons help one another? As Buber notes, therapists

must confirm their patients during therapy, or mutual understanding will never be achieved. Yet devoid of such intimacy, therapy is nothing more than a means whereby one person coerces or controls another. It is for this reason that contemporary writers, such as Jacques Derrida, Jacques Lacan, and Gilles Deleuze, claim that psychologists and psychiatrists are nowadays nothing more than agents of normalization (Deleuze, 1977).

How can clients possibly be confirmed through the use of the DSM-III? (Callahan and Longmire, 1986). Because this diagnostic format has been designed for eventual computerization, the use of formal reasoning is all that is required to render a diagnosis. By following the step-wise instructions provided by a "decision tree," a patient's symptoms can be identified and classified. Further, this can be accomplished without knowing anything about a client's existential condition, or what Binswanger (1963) refers to as a person's mode of "being-in-the-world." Deprived of this type of insight, however, a clinician may never comprehend the experiential character of illness. In a manner of speaking, the DSM-III epitomizes the computerization of therapy. Rules are simply followed until a diagnosis is reached, without any concern for whether or not the judgements that substantiate this diagnostic scheme have any social relevance. Accordingly, precision is inappropriately equated accuracy.

Conclusion

The point of this paper is to indicate that a computer is not simply a tool, for it is underpinned by specific philosophical assumptions that may shape the clinical setting. The computer micro-world, in other words, contains a social component that is able to dictate the nature of therapeutic discourse. As Matarazzo suggests, this underside of technology may reinforce the objectivity thesis to such an extent that a client's needs are distorted. Yet, most important, it is the technological ethic that is dangerous and not necessarily computers.

Currently some writers are arguing that the technological ethic can be tempered somewhat by placing computers in a "reflexive environment" (Murphy, Mickunas, and Pilotta, 1986). This type of situation can be created by recognizing a few points. First, data are not strictly empirical but have meaning. Under-

standing this meaning is important if a client's behavior is to be correctly interpreted. Second, a methodology constitutes a data collection program, and thus is not merely a tool. Recognizing the procedural and philosophical assumptions that accompany a methodology allows their limitations to be revealed. And third, interpersonal discourse requires communicative and not just technical competence. In other words, a client and therapist must appreciate the value-base of each other's reality, before mutual understanding is possible. If these three ideas are instituted, computers may be used profitably by practitioners. For it must be remembered, computer use requires that data be clarified, and not that they be defined solely in an empirical manner.

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