CLINICAL APPLICATIONS OF COMPUTER TECHNOLOGY

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Do substance abuse and mental health clients prefer automated assessments?

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In both psychiatric and substance-abuse services, clinicians have been concerned with the introduction of automated assessments and with their clients' reactions toward those assessments. The positive reactions of psychiatric clients have been well documented, but little has been known about substance-abusing clients' impressions of automated assessments. The impact of automated assessment on clients seeking substance-abuse services was evaluated and compared with a previously analyzed sample of clients seeking mental health services. On the whole, both groups responded similarly and positively to automated assessments. Factor analyses revealed three underlying dimensions in client attitudes toward automated assessment, *Completeness and satisfaction*, *Ease of use and enjoyment*, and *Negative attitudes*. In addition, statistically, though not clinically, significant differences in attitudes were found between various demographic groups. Overall, the results support the use of automated assessments with individuals seeking either substance-abuse or mental-health services.

Computers have long been used to facilitate psychological assessment scoring and interpretation. However, direct automated client assessments have been less accepted. Clinicians have argued that clients would not understand the questions asked by such systems, that they would be too impaired to complete the questions accurately, and that such assessments would interfere with the therapist-client bond, resulting in clients' preferring clinician-conducted assessments (Endicott & Spitzer, 1975; Morgan & Crawford, 1974).

The first concern of clinicians has been that clients would be unable to complete automated assessments. Here it is felt that the assistance of a trained clinician is necessary to adapt questions to the individual's needs and level of understanding and to adapt the assessment structure to the requirements of the situation. However, it has been repeatedly demonstrated that clients *can* complete automated assessments successfully. For example, Erdman, Greist, Klein, Jefferson, and Getto (1981) found that

"85% or more of psychiatric inpatients can be interviewed [by computer] at the time of admission" (p. 394) and that virtually all of these acutely psychotic individuals could be assessed within 3 days of admission. Petrie and Abell (1994) found that only 3% of newly admitted parasuicide patients (5 of 150) refused to complete an automated interview. Angle, Johnsen, Grebenkemper, and Ellinwood (1979) found that none of their 400 outpatient clients had difficulty with or were unwilling to complete a behavioral assessment system with over 3,000 questions that required 4-8 h to complete. Indeed, after completing this main assessment, these clients agreed to also take an additional 2-h automated assessment.

The second concern of clinicians is with the accuracy of the information collected directly from clients. In this regard, they suggest that the client will be more truthful with a clinician than with a machine and that clinicians are required in order to detect client disinformation. To our knowledge, there is no literature available supporting this concern. Nonetheless, it is typically mentioned when we discuss automated assessment with clinicians. To assess accuracy, client self-reports have been compared with interview or paper-and-pencil based reports. In these comparisons, automated assessments have been shown to increase the reported amount of substance use (Lucas, Card, Knill-Jones, Watkinson, & Crean, 1976). On the other hand, after randomly assigning clients to automated,

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written, and clinician interviews, Skinner and Allen (1983) found no differences in client-reported histories of alcohol, drug, and tobacco. To date, there is no evidence to suggest that truthfulness will be decreased in automated assessments.

Clinicians' third concern is that clients will not accept these assessments, that an important bond between assessor and client will be lost, and that clients will feel like second-class citizens. While there is no empirical support for these concerns, clinicians believe that computers will negatively affect therapist–client interactions. The strength of these concerns was evident in a substance-abuse assessment project when the first federal project manager refused to allow client-completed automated assessments, preferring instead a more expensive, less efficient, and more cumbersome paper-and-pencil approach. Only after this individual left the agency were automated assessments approved and developed. The scientific literature allaying these concerns has a long history. Over two decades ago, Greist et al. (1974) found that more than half of the clients completing a suicide-risk questionnaire preferred being questioned by a computer than by a doctor. More recently, Erdman et al. (1992) found that clients held positive attitudes toward automated assessment and were less embarrassed by automated assessments than by human assessments. However, clients were not any more favorably disposed to either human or automated assessments. The lack of embarrassment felt by clients during automated interviewing may account for the favorable attitudes Petrie and Abell (1994) found toward those assessments by parasuicide clients. Of the 150 consecutively admitted patients, 52.3% preferred the automated interview while only 17.4% preferred a clinician interview. Though both Heath (1983) and Greatbatch, Luff, Heath, and Campion (1993) have identified behavioral differences during automated interviews, Aydin, Rosen, Jewell, and Felitti (1995) found that those differences “did *not* depersonalize the encounter for the patients” (emphasis in the original). From these results, it is clear that clients do readily accept automated assessments and, at the very least, show no preference between clinician and automated assessments.

The majority of studies examining automated assessment have used psychiatric clients. To date, only two sets of researchers have examined the impact of automated assessments on substance-abusing clients. In Canada, Skinner and Allen (1983) found that clients responded favorably to automated assessments of drug, alcohol, and tobacco use, while in England, Lucas and his coworkers (Lucas, 1977; Lucas et al., 1976; Lucas, Mullin, Luna, & McInroy, 1977) found that clients reported more alcohol consumption and greater comfort in using automated assessments. However, in all of these studies, a relatively small number of participants were included (fewer than 150). These studies also relied on relatively primitive automated assessments, and focused on individual questions of client satisfaction rather than on patterns across individuals.

The analyses reported in this paper provide information about a large number of clients referred for substance-abuse services who have completed assessments developed for a modern graphic user interface. In addition, these individuals are compared with a sample of individuals seeking mental health services who also completed a set of automated assessments (Hile & Vieweg, 1996).

DESCRIPTION OF SYSTEMS

The Initial Standardized Assessment Protocol (ISAP¹) is a Windows-based application designed to assess clients and match them to appropriate treatments. It was created for use at centralized intake units (CIUs) as part of the St. Louis Target City Project. Its structure and current status are described elsewhere (Hile, 1996). Clients who complete these assessments are either seeking or have been referred for publicly funded substance abuse and addiction treatment. During the collection of the data reported here, all publicly funded clients in St. Louis City and County were assessed with this system. Of these clients, 71% had diagnoses of drug or alcohol dependence and 43% had other psychiatric diagnoses. The client-completed portion of the assessment (ISAP/Client) consists of three measures, the St. Louis Symptom Checklist (Evenson, Holland, Mehta, & Yasin, 1980), the Readiness to Change questionnaire (Heather & Rollnick, 1993), and a measure of quality of life (Evenson & Vieweg, 1996). To help clients successfully complete the assessment, staff supervision is provided. For example, if clients have reading difficulties, a staff member will read the questions to them from the computer monitor. On average, clients complete ISAP/Client in 23 min.

The Clinical/Management Information System (C/MIS) is a DOS-based application designed to assess and track client progress in a purchase-of-service setting. Its development (Hile & Hedlund, 1989) and current status (Hile & Vieweg, 1996) have been described elsewhere. The clients who complete C/MIS automated assessments are seeking publicly funded mental health services. Eighty percent of assessed clients have diagnoses indicating serious mental illness. Clients complete the St. Louis Symptom Checklist (Evenson et al., 1980), the Faces scale to measure quality of life (Evenson & Vieweg, 1996), a medical history, and a social-work assessment. Clients typically take between 45 and 90 min to complete these assessments. The results from these assessments are described fully elsewhere (Hile & Vieweg, 1996). In these analyses only selected comparisons are made between the two client groups.

DESCRIPTION OF MEASURE

The Client Satisfaction with Automated System–Modified (CSAS–M) uses a 5-point Likert scale (*strongly agree* to *strongly disagree*) to evaluate clients' level of satisfaction with 13 statements. The specific items are listed in Table 1. This scale is an adaptation² of the sat-

isfaction measure designed for the C/MIS system (CSAS; Hile & Vieweg, 1996). In both ISAP and C/MIS, clients complete this automated questionnaire after they have completed all of the other automated client-completed assessments.

RESULTS

The ISAP data presented here is for the 4,372 clients who had been assessed by the software as of the spring of 1996. As would be true in nonautomated assessments, clients who were intoxicated or in withdrawal were sent for detoxification before assessment. Of those clients who entered the CIU for assessment, less than 1% were immediately referred for detoxification. All other clients were able to complete their assessments either on their own or with staff assistance. Of the clients assessed, 73% were African American, 71% were males, and the mean age was 32.9 years ($SD = 9.2$). A slight majority (57%) held a high school diploma or GED.

Overall, both ISAP and C/MIS clients positively evaluated their automated assessment experience (see Figure 1). Clients' disagreements with two statements, preference for computer over human assessment ($-.1$ for ISAP users and $-.12$ for those using C/MIS) and truthfulness ($-.25$ for ISAP and 0 for C/MIS) are close enough to 0 to be clinically neutral. The large N s in these two samples allowed a number of statistically significant differences between the two groups to be identified. Only when respondents reflected on the importance and helpfulness

of the questions being asked were the statistically significant group differences also clinically significant, differing by more than a half step (.5).

In addition to examining individual items, a factor analysis (SPSS version 6.1) was performed on ISAP-user responses. All factors with an eigenvalue greater than 1 were extracted and subjected to a Varimax rotation. The three resulting factors *Completeness and satisfaction*, *Ease of use and enjoyment*, and *Negative attitudes* account for 57.6% of the variance in the CSAS-M (see Table 1). The factor structure is quite consistent with the earlier factor analysis of the C/MIS data (Hile & Vieweg, 1996), which identified the same first three factors and an additional single-item fourth factor, *Truthfulness*. For ISAP clients, "truthfulness" (Item 6) moved to the *Completeness and satisfaction* factor.

Factor scores for ISAP-assessed clients were compared across gender, education, and race. As indicated in Table 2, significant differences were found in client evaluations of completeness and satisfaction (women more satisfied), ease of use and enjoyment (women, high school/GED, and whites more satisfied), and negative attitudes (men and those with less education than high school more negative). However, the differences, ranging from .09 to .21 of a step, may not be clinically significant.

DISCUSSION

The data described here for clients seeking substance-abuse treatment addresses the three concerns often ex-

Figure 1. Client satisfaction with automated assessments. Comparison between clients seeking mental health services (C/MIS) and those seeking substance-abuse services (ISAP). Note that Item 4 scores (see Table 1; prefer person) were reverse scored on this figure (prefer computer) so that agreement on each question indicates positive evaluations of the automated system.

Table 1
CSAS-M Item Factor Loadings and Scale Reliabilities

Item	Factor 1 Completeness and Satisfaction	Factor 2 Ease of Use and Enjoyment	Factor 3 Negative Attitudes
1. I was able to use the computer without difficulty.	.08377	.79174	-.08740
2. The instructions on how to answer the questions were clear.	.24515	.78869	-.02158
3. I enjoyed using the computer to answer these questions.	.41441	.62384	-.12974
4. I would rather answer these questions to a person than to a computer.	-.13898	.50949	.80828
5. I would not like to answer any questions on the computer again.	.06269	-.22906	.70902
6. I was able to be more truthful to the computer than I would have been with a person.	.48986	-.27703	-.26784
7. The computer interview was the right length for me.	.61231	.12172	-.20717
8. I was able to describe my problems and feelings quite well.	.72744	.13207	-.08918
9. The computer asked me about things that I think are important.	.69201	.28321	.06385
10. The computer questions were thorough and complete.	.78363	.21209	.2744
11. I think that answering all these questions was helpful.	.74736	.25659	.09526
12. I did not have a problem understanding these questions.	.46846	.49875	-.00329
13. I was satisfied with the computer program and the questions it asked.	.73313	.33710	-.05194
Percent of explained variance	37.4	10.5	9.8
Scale alpha	.82	.76	.74

Note—Bold items indicate the items included on each factor.

pressed by clinicians. First, the vast majority of clients were able to complete the ISAP assessments. Most (81.4%) agreed that they were able to use the computer without difficulty. Nonetheless, the 12.7% of clients who indicated that they had some difficulty using the computer suggests that active staff supervision is important to ensure the level of successful completion obtained in this project.

Second, clients indicated that they would be no more and no less truthful with the computer than with a human interviewer. While this self-report information should be considered with care, other analyses of data collected in ISAP, which examines the correspondence between client responses and staff evaluations, indicates good agreement between the two sources. This is consistent with the published literature (Skinner & Allen, 1983).

The third question deals with the clients' satisfaction with this experience. Clearly, if automated assessments are disliked, clients' negative attitudes might carry over into their responses. Analyzed on an individual item basis, clients are quite positive about the experience. They enjoyed using the computer (85.8% agree or strongly agree), considered the system thorough and complete (75.2%), felt that it allowed them to describe their problems (70.8%),

and that it asked important questions (84%). Analyzed across the test, the first two factors, Completeness and satisfaction and Ease-of-use and enjoyment, account for the bulk of the explained variance, further highlighting clients' positive attitudes toward automated assessments.

The similarity between client evaluations of ISAP and C/MIS is striking. Only two questions with clinically significant differences were identified. C/MIS users thought they were asked less important questions and that not all questions were helpful. This may reflect the fact that client-completed C/MIS evaluations have a broader scope than do those of ISAP. The similarity between the two groups carries over from the individual items to the underlying factor structure. For both systems, completeness and satisfaction, ease of use and enjoyment, and negative attitudes accounted for the majority of CSAS variance.

The data reported here are for all of the individuals seeking publicly funded substance-abuse treatment in St. Louis City and County. These clients are similar to substance users across the country in both large urban and suburban settings and were not members of some special research population. Thus, the generalizability of these results to persons in other metropolitan areas should be quite good.

Table 2
CSAS-M Factor Scale Means and Standard Deviations for Three Groups

Factor	Gender						Education				Race			
	All Clients		Male		Female		Less than High School		High School and Above		White		African American	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
N	4,368		3,105		1,251		1,605		2,087		856		2,299	
Sample			71%		29%		44%		56%		27%		73%	
Completeness & satisfaction	1.21	.72	1.15	.72	1.35*	.72	1.25	.74	1.19	.71	1.16	.68	1.21	.73
Ease of use & enjoyment	1.62	.79	1.59	.80	1.68*	.79	1.52	.83	1.72*	.73	1.69*	.72	1.60	.80
Negative attitudes	.70	.81	.74*	.80	.60	.83	.32*	1.09	.14	1.05	.74	.75	.72	.82

*Response with a significantly higher agreement ($p < .01$; t test for independent samples, two-tailed).

This study supports the use of client-completed automated assessments with individuals seeking substance-abuse services. It has demonstrated that clients can complete such assessments and that they have positive attitudes toward that experience. It addresses only indirectly the question of the agreement of those assessments with more traditional approaches. The similarity between ISAP and C/MIS client attitudes is important because it suggests that previously collected data on mental health clients, which constitute the bulk of the literature in this area, may be appropriately generalized to clients who abuse substances.

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NOTES

1. ISAP is available from the first author for the cost of duplication.
2. The negative wording of Questions 5, 7, 9, and 11 was made positive.

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