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Technology, Professional Practice, and Ethics: Survey Findings and Implications

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If a psychologist loses treatment records because of a computer failure, is it an ethical violation? The widespread growth of technology has outpaced the development of ethical standards for questions such as this, resulting in areas of uncertainty for psychologists. Four hundred twenty psychologists in independent practice rated the ethicality and their frequency of using 40 technologies. Technologies pertaining to the support functions of a psychologist's office are commonly used, but those technologies directly affecting clinical services are rarely used. More than half of the 40 items received equivocal ratings on ethicality, suggesting psychologists need guidelines and training for the use of technology in professional practice.

A typical day in a professional psychologist's office might include photocopying or faxing confidential records, electronic claims filing, using a computerized voice mail system, scoring personality tests on the computer, and so on. A few psychologists might also provide supervision by means of electronic mail (E-mail) or exposure treatments with virtual reality. How common are these various technologies in psychological practice, and what are the ethical implications of emerging technological advances within the profession?

When Pope, Tabachnick, and Keith-Spiegel (1987) published survey results concerning the ethics of professional psychologists, their report provided an important "real-world" glimpse into the practices and beliefs of American Psychological Association (APA) members providing professional services. The authors were careful to note that the norms of professional practice should not necessarily determine ethical standards but correctly observed that professional ethics codes are most effective when those developing the codes are aware of the dilemmas and tensions confronting members of the organization.

Although the APA has been diligent to keep ethical standards current through changing practice environments, the rapid rate of change observed among electronic technologies creates unprecedented challenges for professional psychology's national organizations and ethics committees. The APA Ethics Committee ap-

pears to be making admirable efforts in this regard (e.g., 1995 and 1997 statements on "Services by Telephone, Teleconferencing, and the Internet"), and the APA Board of Professional Affairs sponsored a 1997 institute on telehealth. However, the dearth of systematic research on the ethics of technology in professional practice makes it difficult to anticipate which technologies are creating ethical tensions, controversies, and dilemmas.

Technology and Practice Survey

In February 1997, questionnaires were sent to 1,000 randomly selected APA members identifying independent practice as their primary employment setting. Four hundred twenty respondents completed and returned questionnaires. Just more than half the respondents (51%) were male, most respondents (60%) were between the ages of 46 and 60 years, and most (91%) were European American. The majority of respondents practiced in urban (49%) or suburban (41%) locations, the average annual income was just over \$80,000, and three-quarters of the respondents reported having 50 or more clinical appointments per month.

The questionnaire used the same response format as the questionnaire developed by Pope et al. (1987). Forty behaviors were listed (see Table 1), and respondents were asked to rate the frequency with which they engaged in each behavior and their beliefs about the ethics of each behavior. The list of 40 behaviors was constructed on the basis of a recent literature review (McMinn, 1998) in which three waves of technological advances were described. First-wave technology allows for efficiency in maintaining records and office procedures but has little direct impact on clinical services (e.g., computerized billing, photocopying). Second-wave technologies have a greater direct impact on patient care and should be considered partially established in that some psychologists already use these technologies (e.g., using computers to assist with test administration or interpretation). The third wave includes emerging innovations that have only started to affect the practice of psychology (e.g., using virtual reality in treating anxiety disorders). Survey items were constructed to represent each of these waves of technology, with items rationally clustered into three scales. Other survey items were constructed to

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Table 1
Percentage of Psychologists (N = 420) Responding in Each Category

Item	Rating									
	Occurrence in your practice?					Ethical?				
	1	2	3	4	5	1	2	3	4	5
1. Personally photocopying confidential client information	10.5	11.9	30.0	20.0	24.5	3.8	7.9	4.5	24.0	56.7
2. Having secretarial staff photocopy confidential client information	46.4	12.6	13.6	12.6	12.4	11.2	13.1	11.9	39.3	20.5
3. Retrieving audible messages from an answering machine in the presence of colleagues	74.8	15.5	6.0	1.9	1.2	37.6	34.8	10.0	11.2	5.2
4. Retrieving audible messages from an answering machine in the presence of support staff	78.1	10.2	4.3	2.9	3.1	41.0	23.3	9.5	16.0	7.9
5. Retrieving audible messages from an answering machine in the presence of clients	96.0	1.4	0.5	0	0	89.5	4.0	1.4	0.5	3.3
6. Failing to receive client messages due to equipment failure or technical problems	12.6	71.7	14.8	0	0	10.7	15.2	34.3	12.4	19.0
7. Providing regularly scheduled clinical services via telephone	32.1	46.0	16.4	2.6	2.4	5.0	33.1	11.2	29.8	18.8
8. Providing consultation for a colleague via telephone	5.0	28.8	49.5	12.6	3.6	1.0	6.2	6.0	40.5	45.2
9. Providing clinical supervision via telephone	46.4	33.8	16.0	2.4	0.2	6.0	26.7	12.9	28.8	22.9
10. Providing crisis intervention via telephone	2.9	14.5	53.1	22.9	5.2	1.4	4.0	2.4	33.1	57.4
11. Providing clinical services on telephone while charging via a 1-900 number	98.6	0	0.5	0.2	0	35.5	10.7	40.5	5.5	5.0
12. Faxing confidential information to another psychologist's office	28.1	26.7	30.5	10.5	3.1	6.7	17.4	16.9	41.7	15.5
13. Faxing client information to a hospital floor	77.4	12.1	6.0	1.7	0.7	15.0	28.1	23.6	23.1	7.4
14. Inadvertently faxing confidential client information to an incorrect location	91.9	6.4	0	0	0	58.1	7.6	19.3	4.0	6.4
15. Using a computer to take notes during therapy	93.1	3.1	0.7	1.4	1.0	11.9	11.4	30.5	21.4	23.1
16. Storing therapy records on a personal computer	55.2	9.3	12.6	6.0	15.5	4.3	5.0	18.6	30.5	39.5
17. Storing therapy records on a computer network	95.2	1.2	0.7	0.5	1.4	40.7	14.0	28.6	10.0	4.0
18. Storing clients' financial records on a personal computer	41.2	5.2	5.7	8.1	39.3	4.8	3.6	15.0	26.9	48.6
19. Storing clients' financial records on a computer network	90.0	0.7	0.2	1.2	7.0	36.7	10.0	30.0	12.1	9.3
20. Using a computer to generate client bills	30.2	3.8	7.1	8.1	49.3	1.4	0.7	8.1	21.0	66.2
21. Electronic (paperless) claim filing with insurance companies	70.0	4.5	8.1	6.4	10.0	2.4	2.6	24.3	21.0	47.9
22. Losing client records due to a computer failure	83.6	12.9	1.9	0	0	16.9	10.7	41.4	11.4	12.9
23. Allowing unauthorized access to confidential client records (e.g., by a computer hacker)	97.4	0.7	0	0	0	75.2	3.6	9.8	1.9	5.0
24. Leaving confidential client information displayed on a computer monitor where other clients might see it	93.1	5.5	0.5	0	0	89.0	2.4	1.7	0.2	4.3
25. Using computer-assisted therapy as an adjunct to traditional therapy	91.9	4.3	1.7	1.0	0	12.1	16.4	33.3	23.8	12.4
26. Using computer-assisted therapy in lieu of traditional therapy	97.4	1.4	0	0	0	36.4	24.0	26.7	7.4	3.1
27. Providing direct clinical services on the Internet	98.1	0.7	0.2	0	0	48.8	14.8	26.9	3.8	3.8
28. Advertising psychological services on the Internet	95.0	2.1	1.4	0	0.7	10.5	7.4	36.7	27.9	16.2
29. Providing direct clinical services via e-mail	96.7	2.1	0	0.2	0	39.3	20.7	26.9	7.9	3.1
30. Providing consultation for a colleague via e-mail	86.9	7.9	3.6	0.5	0.2	15.5	16.2	28.1	28.6	10.0
31. Providing clinical supervision via e-mail	95.5	2.1	0.5	0	0	25.5	21.9	29.5	14.0	6.0
32. Using computerized test administration software	59.0	12.6	15.0	4.8	7.9	1.7	2.4	9.8	35.7	49.0
33. Using computerized test-scoring software	43.6	11.0	18.6	12.4	13.8	1.4	1.0	6.9	31.2	58.3
34. Using computerized test interpretation software	45.2	14.5	18.6	10.0	10.2	2.9	5.7	10.7	38.3	40.2
35. Relying on computer software for diagnosis	86.2	9.2	2.7	0.5	0.2	47.1	22.1	12.6	9.5	6.0
36. Allowing professionals other than psychologists access to computerized assessment tools	91.9	4.3	1.4	0.7	0.2	55.5	20.0	12.9	5.5	3.3
37. Using teleconferencing for psychotherapy	89.3	7.9	1.7	0	0.2	19.5	29.8	31.9	10.7	5.7
38. Using teleconferencing for consultation	78.1	13.8	5.5	1.2	0.5	4.5	18.6	25.2	35.7	14.0
39. Using teleconferencing for clinical supervision	89.5	6.9	2.1	0.2	0.2	8.6	21.0	29.8	27.1	11.2
40. Using virtual reality in treating an anxiety disorder	96.9	1.7	0	0.2	0	8.3	4.5	45.5	21.4	17.4

Note. Rating codes: Occurrence in your practice? 1 = never, 2 = rarely, 3 = sometimes, 4 = fairly often, 5 = very often; Ethical? 1 = unquestionably not, 2 = under rare circumstances, 3 = don't know/not sure, 4 = under many circumstances, 5 = unquestionably yes. Responses 1–5 for both ratings sum to less than 100% because of missing data.

probe specific ethical tensions that occur as psychologists use various technologies; these were not included in any of the three scales.

The respondents' ratings of each of the 40 items are presented in Table 1. Descriptive analyses were used to identify common, rare, and equivocal behaviors. Results are presented in those categories, then scale scores for the three waves of technology are reported along with the multivariate repeated measures analyses used to analyze response patterns.

Common Behaviors

Only two behaviors occurred for 90% or more of the respondents: providing consultation for a colleague on the telephone (95%) and providing crisis intervention on the telephone (96%). Both of these behaviors were also considered to be ethical by the majority of respondents, with 86% and 91%, respectively. Other uses of the telephone engendered more controversy, and these are considered in the section *Equivocal Behaviors*.

There were no computer-related technologies that emerged as common behaviors in this survey. Given the ubiquity of computers in most businesses and professions, it is interesting to observe a relatively modest rate of computerization among psychologists, even for the Wave 1 technologies that have little or no direct impact on clinical services. Moreover, it does not appear that computer use has escalated with the monumental technological innovations of the past decade. When Farrell (1989) surveyed 227 APA members in professional practice in 1987, he found that 63% frequently or routinely used computers for client billing, 41% for test scoring, 29% for test interpretation, and 20% for maintaining client records. The present data, collected from a similar sample a full decade after Farrell's survey, show no increase in computer use, with 57% fairly often or very often using computers for client billing, 26% for test scoring, 20% for test interpretation, and 22% for maintaining client records. The percentages in the present study are also very similar to those reported by Rosen and Weil (1996), based on a 1995 telephone survey of 213 California psychologists.

Rare Behaviors

Rare behaviors were considered to be those that had never occurred for 90% or more of the respondents. Among the 16 rare behaviors identified, a wide variance was observed in respondents' ethics ratings. Some behaviors rarely occurred and were predominantly perceived as unethical, presumably because they compromised test security or patient confidentiality. These behaviors include allowing professionals other than psychologists access to computerized assessment tools, listening to a confidential message from one client in the presence of another client, leaving confidential information displayed on a computer screen where a client might see it, inadvertently faxing confidential information to an incorrect location, and allowing unauthorized access to client records (e.g., by a computer hacker). Although these behaviors can typically be avoided by alert psychologists, they illustrate how technological advances have removed some degree of control over client confidentiality.

Other rare behaviors in this survey were deemed to be less ethically problematic by most respondents. These behaviors reflect emerging technological trends that are not yet widely used in

professional psychology, including using virtual reality to treat an anxiety disorder, advertising on the Internet, using computer-assisted therapy as an adjunct to traditional therapy, and using a computer to take notes during therapy. These behaviors are among those considered equivocal behaviors and are considered in the following section.

Equivocal Behaviors

Behaviors were deemed *equivocal* when one of two conditions were met on ethics ratings. First, 9 items were considered equivocal because more than 20% of respondents circled "don't know/not sure" on the ethics rating. Second, 5 items were considered equivocal because more than 20% rated the behavior as never or rarely ethical, yet another 20% or more rated the item as unquestionably ethical or ethical under many circumstances. Ten items met both criteria established for equivocal items. Of the 40 items on the survey, a total of 24 met one or both of these criteria, or 60% of the survey items. These 24 items can be summarized by considering confidentiality concerns, technology failure, telephone services, computer applications, and teleconferencing.

Client confidentiality. Six of the equivocal items pertained to confidentiality concerns: having a secretary photocopy confidential client information (Item 2), retrieving audible messages from an answering machine in the presence of support staff (Item 4), faxing confidential information to another psychologist's office (Item 12) or to a hospital floor (Item 13), and storing therapy records (Item 17) or client financial records (Item 19) on a computer network.

Although the majority of psychologists believe it is ethical to personally photocopy confidential client information, and 45% report doing so fairly or very often, there is more ethical ambiguity about having a secretary photocopy confidential material, and only 25% report doing so fairly or very often. In addition to confidentiality concerns, this may be partly related to psychologists not having immediate access to photocopying—35% of California psychologists interviewed in a recent study did not have a photocopy machine at home or at the office (Rosen & Weil, 1996).

Almost one quarter of the respondents believed it was ethical to replay answering machine messages in the presence of support staff, whereas another two thirds believed it to be generally unethical. A high percentage of respondents (75%) reported never having done so.

Approximately 71% of the respondents reported faxing confidential material to another psychologist's office at least rarely. This corresponds with Rosen and Weil's (1996) finding that 78% of psychologists had a fax machine either at home or at their office. With the availability and prevalence of fax technology, there appears to be disagreement and uncertainty about the proper ethical boundaries for using fax machines. Just under one fourth of the respondents viewed faxing information to another psychologist's office as generally unethical, yet another half of the respondents reported it to be generally ethical. Almost 17% reported not knowing whether it was ethical. There was similar uncertainty about faxing information to a hospital floor, though more respondents saw it as unethical, fewer respondents saw it as ethical, and almost one fourth did not know.

Two equivocal items pertained to storing client records, both therapy records and financial records, on a computer network.

Approximately half of the respondents saw each as unethical, and almost one third reported they did not know whether these behaviors were ethical.

Technology failure. Two of the equivocal items pertained to technology failure: failing to receive client messages because of equipment failure or technical problems (Item 6) and losing client records due to a technology failure (Item 22). A large number of respondents reported that they did not know whether these events were ethical—34% and 41%, respectively.

Telephone services. Three of the equivocal items pertained to providing services via telephone: providing regularly scheduled clinical services via telephone (Item 7), providing clinical supervision via telephone (Item 9), and providing clinical services on the telephone while charging by means of a 1-900 number (Item 11). For the first two of these items, there was a bimodal distribution, with most respondents reporting the behaviors as generally unethical or generally ethical and relatively few unsure respondents. For the third item, providing telephone services while charging by means of a 1-900 number, most respondents were either unsure (41%) or perceived it to be generally unethical (46%).

In a recent review of the literature, Haas, Benedict, and Kobos (1996) distinguished between telephone use as an adjunctive tool in therapy and telephone-only therapy. With regard to using the telephone as an adjunctive tool, telephones have commonly been used for crisis intervention, referral, screening, and consultation with colleagues. Most respondents in the present survey reported such behavior to be ethical (see Items #8 and #10), and the APA Ethics Committee (1995) has deemed these uses of the telephone to be “reasonably well established” (p. 1). There is more controversy surrounding telephone-only therapy, which can involve either conventional therapeutic relationships conducted by telephone or pay-per-call services, where the client is charged per minute of phone use. It is interesting that survey respondents viewed the former with controversy (bimodal distribution) and the latter with uncertainty (high rate of “don’t know” responses), though the only apparent difference between the two items is the method of payment and whatever negative associations respondents may have with 1-900 number services.

Computer applications. Ten of the equivocal items pertained to computer applications. Two of these items pertained to business management aspects of psychology: electronic (paperless) claim filing with insurance companies (Item 21) and advertising psychological services on the Internet (Item 28). The remaining eight items pertained more directly to clinical activities: using a computer to take notes during therapy (#15); using computer-assisted therapy as an adjunct to (Item 25) or in lieu of (Item 26) traditional therapy; using virtual reality in treating an anxiety disorder (Item 40); providing direct clinical services on the Internet (Item 27); and providing direct clinical services (Item 29), consultation (Item 30), or clinical supervision (Item 31) by means of e-mail.

Although the majority of respondents reported it is ethical to submit electronic claim filing with insurance companies, 24% reported being unsure whether such behavior is ethical. This uncertainty is probably related to lack of familiarity with electronic billing software—Rosen and Weil (1996) reported that only 12% of the psychologists in their sample used billing systems designed for mental health professionals, and only 3% used electronic billing. In a similar vein, although many respondents believed it is ethical to advertise psychological services on the Internet, over one

third were unsure. This may also reflect a lack of familiarity with Internet services and advertising.

The majority of equivocal items pertaining to computer applications related to direct uses of computers in clinical services. There were both disagreement and uncertainty expressed about using a computer to take notes during therapy. Although many psychologists (45%) see this as ethical, the vast majority of psychologists (93%) have never used a computer in this way.

Respondents were almost equally split in their opinions about the ethics of using computers as adjunctive tools in therapy: Approximately one third viewed it as unethical, one third were unsure, and one third viewed it as ethical. Using a computer in lieu of traditional psychotherapy was viewed more critically, with 60% reporting it to be unethical; however, an additional 27% were unsure. Although few respondents reported using virtual reality for the treatment of an anxiety disorder to be unethical, a large number (46%) reported that they were not sure.

Most respondents perceived providing direct clinical services on the Internet and by means of e-mail to be unethical, but approximately one fourth of the respondents were unsure for each item. The 1995 statement by the APA Ethics Committee provided some help with this, suggesting that because of the absence of all nonverbal cues the Internet “appears to be a more limited medium for the delivery of therapy services than telephone” (p. 2). Neither the 1995 nor the 1997 APA Ethics Committee statement provided an explicit opinion regarding consultation or clinical supervision, although presumably some of the same concerns apply. In the present study, a high rate of uncertainty was observed regarding the ethics of providing consultation (28%) or supervision (30%) by means of e-mail.

Little controversy surrounding the use of computerized test administration, scoring, and interpretation software was reported, with most respondents viewing these computer applications as ethical. This was unexpected given the vigorous debate about computer-based test interpretation software appearing in the psychology literature of the 1980s and early 1990s (e.g., Matarazzo, 1986).

Teleconferencing. Teleconferencing, also known as videoconferencing, allows for visual and auditory communication through television monitors. Teleconferencing opens the possibility of providing clinical services in underserved areas and has been favorably received in many rural communities. Medicare now reimburses for services provided by telehealth in rural areas, and the Federal Communications Commission (FCC) has established a grant program to encourage development of telehealth services in rural America.

In the present survey, wide variation was observed among psychologists’ opinions about the ethics of teleconferencing, with 32%, 25%, and 30%, respectively, reporting they did not know whether teleconferencing was an ethical means of providing psychotherapy, consultation, or clinical supervision. Sizable groups of respondents (16%, 50%, and 38%, respectively) reported these behaviors to be ethical, whereas other respondents (49%, 23%, and 30%) reported them to be unethical.

Three Waves of Technology

Scale scores were computed for the three waves of technology by averaging ratings on each of the items contributing to the scales.

The occurrence in practice ratings were averaged separately from the ethics ratings, resulting in six scale scores for each respondent: Wave 1 Practice, Wave 1 Ethical, Wave 2 Practice, Wave 2 Ethical, Wave 3 Practice, and Wave 3 Ethical. Scale score means and internal consistency coefficients, using Cronbach's alpha, are reported in Table 2. The relatively modest internal consistency of the scales reflects the short scale length, the heterogeneity of the items, and attenuation caused by the restricted range of responses on some items. Attenuation is especially pronounced for the Wave 3 Practice scale, which included behaviors rarely practiced by the psychologists in the sample.

We used repeated measures multivariate analyses of variance to find significant multivariate effects across the three waves for both Practice ratings, Wilks's $\lambda = 0.22$, $F(2, 416) = 741.18$, $p < .0001$, and Ethics ratings, Wilks's $\lambda = 0.32$, $F(2, 406) = 446.82$, $p < .0001$, as illustrated in Figure 1. As expected, psychologists in the sample reported more frequent use of Wave 1 technologies—those pertaining to routine office management tasks—than Wave 2 technologies, $F(1, 417) = 727.10$, $p < .0001$, effect size $r = .80$. Wave 2 technologies were more common than Wave 3 technologies, $F(1, 417) = 548.74$, $p < .0001$, effect size $r = .75$. The Ethics ratings showed a similar trend, with Wave 1 having greater approval than Wave 2 technologies, $F(1, 417) = 541.63$, $p < .0001$, effect size $r = .75$, which, in turn, had greater approval than Wave 3 technologies, $F(1, 417) = 325.96$, $p < .0001$, effect size $r = .66$.

These differences may reflect some uncertainty and skepticism about using emerging technologies in psychology, as well as the tendency for Wave 2 and Wave 3 technologies to impact direct clinical services more than Wave 1 technologies. Because the relational fabric of psychotherapy is perceived as a critical ingredient of change for many psychologists, there is an understandable reticence to embrace technologies that usurp or supplant the therapeutic relationship. Nonetheless, there may be certain technologies that make the therapeutic process more efficient without detracting from the therapeutic relationship. Differentiating effective technologies from potentially damaging technologies will be an important task for researchers and clinicians in coming years.

Although several demographic and practice variables correlate significantly with the Wave 1 Practice scale, none of them account for a large portion of variance. Age is negatively related to scores on the Wave 1 scale (Spearman $r = -.25$, $p < .0001$, $n = 411$), and the year in which respondents received their highest degree is positively related to scores on the Wave 1 scale (Spearman $r =$

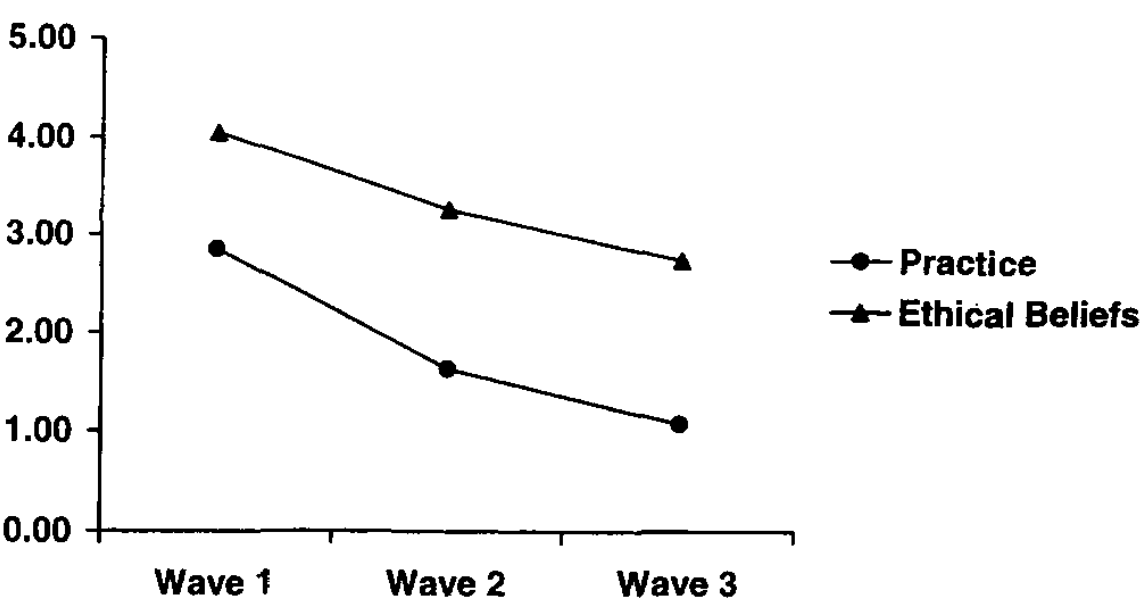


Figure 1. Practice and Ethics ratings for Wave 1, Wave 2, and Wave 3 technology scales. Rating codes: Occurrence in your practice? 1 = never, 2 = rarely, 3 = sometimes, 4 = fairly often, 5 = very often; Ethical? 1 = unquestionably not, 2 = under rare circumstances, 3 = don't know/not sure, 4 = under many circumstances, 5 = unquestionably yes.

.22, $p < .0001$, $n = 391$). This suggests that those who attended graduate school most recently and who are younger are slightly more likely to use Wave 1 technologies than other respondents. No similar relationships were observed for Wave 2 and Wave 3 technologies.

Implications for Professional Practice

Psychologists are adapting at different rates to the changing nature of communication in the current age of accelerating technological advances. There are areas of tension and disagreement, and we will need to work at listening to and understanding one another. The risks to consumers of psychological services must be carefully considered, appropriate ethical guidelines must be established, and adequate resources must be developed for training and retraining psychologists. Several recommendations are offered here, some directed to the organizations that support the profession of psychology (e.g., APA) and some directed toward individual practitioners.

Recommendations at the Organizational Level

Among the various health care professions the APA has an exemplary record of providing ethical guidance for the practice of psychology. In addition to frequent revisions of the ethics code, the APA has published various supporting documents and guidelines

Table 2
Scale Scores and Internal Consistency Coefficients for Three Waves of Technology

Variable	No. of items	N	M	SD	Mdn	Range (min-max)	Cronbach's α
Practice							
Wave 1	5	419	2.86	0.98	3.00	1.00-5.00	.63
Wave 2	9	419	1.63	0.49	1.56	1.00-3.50	.64
Wave 3	4	418	1.07	0.20	1.00	1.00-2.25	.33
Ethical							
Wave 1	5	419	4.06	0.73	4.00	1.00-5.00	.71
Wave 2	9	419	3.26	0.65	3.22	1.00-5.00	.74
Wave 3	4	416	2.74	0.82	2.75	1.00-5.00	.70

Note. min-max = minimum-maximum.

pertaining to emerging practice issues. In recent years, for example, guidelines have been published for record keeping (APA Committee on Professional Practice and Standards, 1993), for providing services to diverse populations (APA Office of Ethnic Minority Affairs, 1993) and for child custody evaluations (APA Practice Directorate, 1994). However, these areas change more slowly than technology.

With the technological explosion of the past 2 decades, it has proved difficult for ethical guidelines to keep abreast of advances. More than half of the items on this survey received equivocal ethics ratings. Psychologists are uncertain about the ethical use of many technologies. These uncertainties need to be addressed at an organizational level in at least two ways: providing guidance for the immediate ethical challenges created by recent technological advances and establishing an ongoing structure for considering the professional implications of accelerating technological changes. An ad hoc task force of the APA Ethics Committee might help address the first need by providing guidance on the technological advances of recent years. This guidance could then be formalized in the next iteration of the APA ethical guidelines. Once the task force has completed its work, however, a new gap between ever-changing technology and ethical guidelines will begin to accumulate. Given the accelerating rate of technological advance, this next gap may quickly become more problematic than the one we currently face. Thus, the challenge of anticipating new technologies and providing ethical guidance in a timely manner may ultimately require structural change such as establishing a standing subcommittee of the APA Ethics Committee.

Although the most recent version of the Ethical Principles of Psychologists and Code of Conduct (APA, 1992) includes some guidance regarding technology, including maintenance of records (Standard 5.04), storage of confidential information in an electronic database (Standard 5.07), and informed consent in research filming or recording (Standard 6.13), many areas remain uncovered.

Client confidentiality. Challenges to client confidentiality are likely to escalate, especially as computing resources become globally networked. As global networks create new possibilities for outcome research and centralized record keeping for reimbursement purposes, they also create potential ethical problems for maintaining client confidentiality. A 1997 *Newsweek* headline, "Naked Before the World," was followed with the subtitle query, "Will your medical secrets be safe in a new national databank?" (Spragins & Hager, 1997).

To illustrate this concern, consider the possibility of dynamic norming for personality tests. A testing client could complete a standardized personality test on-line, the results could be sent immediately to a central computer where norms are kept and continually updated, and then a report could be immediately produced. This report could be based on the overall normative sample or on appropriate subgroup norms. This scenario is quite similar to products already being marketed by major test publishers. The possibilities are intriguing and promising, and yet there are issues of informed consent, privacy, and confidentiality that must be worked out.

Technology failures. Computer disks are highly reliable devices that have a limited life expectancy. Every computer disk will eventually fail, and often the data contained on the disk will be lost. This poses some difficult ethical dilemmas. For example, if a

disk storing confidential client information fails, should the psychologist send it to a service specializing in restoring data from disks that "crash"? Should it be sent for repair? Even if the disk can be repaired, might this introduce a threat to client confidentiality? What ethical responsibilities do psychologists have to regularly backup information stored on computer disk?

Although the current APA Ethical Principles and Code of Conduct (APA, 1992) clearly states that psychologists are responsible for protecting their records and data, it is difficult to know the extent of the responsibility when faced with uncontrollable events. If a psychologist loses a telephone message or computer record because of technological failures beyond his or her control, does this reflect unethical behavior on the part of the psychologist? In a similar vein, if client confidentiality is violated by a computer hacker, is this an ethical violation on the part of the psychologist? As globally networked technology becomes a more central part of helping professions and reimbursement systems, these uncontrollable events are likely to become more prevalent and more highly publicized.

Providing services from a distance. The Ethics Committee of the APA has been proactive regarding services provided from a distance, issuing 1995 and 1997 statements on "Services by Telephone, Teleconferencing, and Internet." The most recent statement is brief and nonprescriptive, but it does promise consideration of these matters in future revisions of the ethics code. Also, it references specific standards in the APA Ethical Principles and Code of Conduct (APA, 1992) that psychologists should carefully consider when providing services from a distance.

Training issues. More than half of the participants in the Rosen and Weil (1996) study considered themselves to be mildly to highly "technophobic," which helps explain why psychologists are not using many current technologies in their professional work. This suggests a need for graduate training and continuing education in appropriate technological applications for professional practice. Many of these educational experiences should be designed for an introductory audience in order to make current technologies accessible to all psychologists. Much as the profession of psychology has developed systematic plans for training in prescription privileges, the relevance of professional psychology in the future may require similar efforts for training and retraining psychologists to use technology prudently and effectively.

Collaborative research. With the increasing emphasis on collaboration with various professions, including primary care medicine, lawyers and judges, and clergy, it would also be wise to collaborate with technology experts, including software and electrical engineers, in establishing potential interventions and assessment tools for the future practice of psychology. At first, university researchers who have access to funding may do this. Just as older forms of technology have become commonplace in certain psychology practices (e.g., biofeedback for the medical psychologist), these emerging technologies will eventually become cost-effective and practical in professional practice settings.

Recommendations and Implications for Professional Psychologists

Client confidentiality. Psychologists who implement emerging technologies in their work must be careful to consider the ethical implications of their choices. Most often, these implications con-

cern client confidentiality. Because confidentiality laws vary from state to state, it is difficult to specify clear standards for limits of confidentiality. Pope and Vasquez (1998) provided helpful advice in the absence of prescriptive standards: "The Golden Rule can be a useful guide. What steps would we want a therapist to take if it were our chart, containing our deepest secrets, our personal history, our conflicts, our diagnosis, and our prognosis?" (p. 233). They go on to say that answering machines "create special pitfalls" (p. 234). For example, a patient may leave a message for a psychologist, assuming the psychologist is the only one listening, especially if the greeting message is recorded by the psychologist. If a staff member or another professional in the office then listens to the recorded message, the patient may have disclosed information that was not intended for others in the office. Computerized voice mail systems may help with this problem, as most voice mail systems have individual voice mail "boxes," which can be selected by the calling party. The boxes are usually password protected, thereby reducing the inadvertent violations of patient privacy that occur with low-cost answering machines.

Because fax transmissions pose potential threats to client confidentiality, psychologists should be careful to observe ethical standards regarding informed consent and take whatever steps are necessary to assure confidentiality at the receiving end of the fax transmission. Some jurisdictions have statutes limiting confidential fax transmission with which psychologists should become familiar.

When confidential material is stored on a computer accessible to others, access should be limited. The current APA Ethical Principles and Code of Conduct (APA, 1992) specifies that any client information stored in databases accessible to unauthorized viewers must be coded in a way that no personally identifying information is revealed. Some psychologists may avoid this problem by using passwords and other safeguards to restrict access to client information. However, it should be noted that many forms of electronic security are penetrable.

Technology failures. Just as psychologists are to anticipate their eventual death and plan to deal with confidential materials accordingly, so should they anticipate the eventual "death" of computer hardware. Although appropriate protection devices (e.g., surge protectors) can reduce the risk of losing data through technology failure, all hardware eventually fails. Appropriate disposal of failed hardware should be anticipated, and a regular backup program implemented. Backup media should be protected with the same diligence as other confidential records.

Providing services from a distance. Using telephones to deliver clinical services is a relatively recent phenomenon and is gaining the attention of psychologists and professional organizations such as the APA (APA Ethics Committee, 1997). Despite such concern, several intriguing and promising applications for telephone therapy have been reported (Haas et al., 1996). It is important that psychologists offering services by telephone observe all relevant ethical standards that pertain to providing psychological services and consider the potential liabilities of telephone therapy.

Teleconferencing is on the rise among the health care professions, including mental health care (C. J. Ball, Scott, McLaren, & Watson, 1993; Tröster, Paolo, Glatt, Hubble, & Koller, 1995). The APA Ethics Committee (1995) noted that teleconferencing adds visual information to electronic interventions and is therefore an

improvement on telephone or Internet interventions. However, the Committee cautioned that such services are not yet established as standard means of intervention and are therefore subject to the cautions outlined under Boundaries of Competence (Standard 1.04c) in the APA Ethical Principles and Code of Conduct (APA, 1992).

Computer applications. Computer applications in psychotherapy have been steadily developing over the past 3 decades and are now used in some therapeutic contexts. The least controversial of these applications involve adjunctive educational programs (Bloom, 1992). For example, while waiting for an appointment with a psychologist a patient may find it helpful to participate in an educational computer simulation designed to enhance self-esteem, facilitate responsible sexual choices, or reduce alcohol consumption. Others have found adjunctive uses for computers during therapy sessions. For example, Kokish (1994) reported using a microcomputer as part of play therapy with children, and neuropsychologists have used computer rehabilitation programs to help restore executive functioning (Gianutsos, 1992).

More controversial are the applications designed to replace or replicate part of the therapeutic intervention (e.g., Kenardy & Adams, 1993). One's opinion of computer therapy tools will be partially determined by theoretical orientation. Those who see the human relationship as an essential part of the psychotherapeutic process are not likely to see great value in psychotherapy software. Those who see the delivery of structured techniques as the active ingredient in psychotherapy are likely to be more encouraged by these recent software developments.

One intriguing possibility for using computers in therapy is found in virtual reality applications. Virtual reality combines computer hardware and software to simulate real-life experiences by presenting computer-generated graphics and sounds that are responsive to the movements and responses of the individual using the software. Two reports of using virtual reality to treat acrophobia have recently been published (Rothbaum et al., 1995a, 1995b). By simulating graded exposure to heights, the researchers successfully provided many of the same benefits associated with in vivo graded exposure while also giving the therapist greater control over the stimulus conditions. This appears to be a promising technology for psychology, with the only known liability being the uncertainty of generalizability to real-life situations. Other applications of virtual reality in the practice of psychology may be forthcoming, including the introduction of "virtual people" to help clients learn appropriate social skills (Glantz, Durlach, Barnett, & Aviles, 1996).

Some preliminary evidence from medical practice suggests that it may be important to avoid using computers for record keeping during the consultation itself. Physicians in the United Kingdom showed a diminished capacity to relate with patients when using a computer rather than pen and paper to issue prescriptions (Greatbatch, Heath, Campion, & Luff, 1995). Although this finding cannot be directly translated to psychological interventions, it is possible that using a laptop or notebook computer to take notes during a therapy session has an inhibiting effect on the human interactions that play an essential role in services provided by professional psychologists.

Computer software has become widely accepted as a way to administer, score, and interpret psychological tests. This is somewhat unexpected given the lively debates appearing in the litera-

ture over the past 2 decades (Matarazzo, 1986) and the fact that the APA temporarily published cautionary *Guidelines for Computer-Based Tests and Interpretations* (APA, 1986). These debates of the late 1980s and early 1990s have given way to widespread use and approval of computerized assessment tools. In a recent survey of members of the Society for Personality Assessment and members of the Clinical Psychology Division of the APA, almost two thirds of the respondents indicated that they use computers to assist with psychological testing (J. D. Ball, Archer, & Imhof, 1994). Another recent survey suggests psychologists generally use computer-based test interpretation software in a responsible and ethical manner (McMinn, Ellens, & Soref, in press).

A Concluding Observation

Nearly a decade ago, Farrell (1989) concluded that "computers appear to be having a minimal impact on practice" (p. 176). Despite monumental technological innovations in the past decade, it appears reasonable to expand Farrell's conclusion and assert that technology in general appears to have a minimal impact on practice. Wave 1 technologies, those well-established technologies pertaining to the support functions of a psychologist's office (e.g., photocopying, fax, computerized billing, and record storage), continue to be a part of many psychologists' work, but those technologies that affect clinical services more directly are rarely used. Nevertheless, the horizon of professional psychology is replete with new possibilities for technology to enhance practice. The possibilities must be carefully anticipated because they will bring both potential to help and risk of harm.

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