Telemental Health Technology in Deaf and General Mental-Health Services: Access and Use

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American Annals of the Deaf, Volume 151, Number 3, Summer 2006, pp. 311-317 (Article)

Published by Gallaudet University Press
DOI: 10.1353/aad.2006.0033

TELEMENTAL HEALTH TECHNOLOGY IN DEAF AND GENERAL MENTAL-HEALTH SERVICES: ACCESS AND USE

LONG-DISTANCE TRAVEL to provide mental health services for deaf people has implications for efficiency, safety, and equality of service. However, uptake of Telemental Health (TMH) has been slow in both deaf and general mental health services. A quantitative study was used to investigate access to TMH and whether staff confidence, experience, or demographics affect TMH use. It was concluded that staff in neither deaf mental health services nor general mental health services had adequate knowledge of or access to TMH. Staff expressed concerns over TMH's appropriateness in their work. Previous use of videoconferencing was associated significantly with confidence, but previous use of videophones was not. Neither staff in deaf services nor deaf staff were more experienced with or more confident about videoconferencing, whereas, within deaf services, deaf staff were significantly more confident about videophone use. Training implications are discussed.

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Telemental health (TMH), or telepsychiatry, is the use of electronic information and communication technology to provide or support clinical mental-health care from a distance. TMH may include use of the telephone, faxing, e-mail, the Internet, still and live imaging, interactive two-way audio-video communication (videophoning), or television conferencing (i.e., videoconferencing), also called interactive television (Hilty, Luo, Morache, Marcelo, & Nesbitt, 2002). Videoconferencing is widely used in TMH with the general population, while videophones are more commonly used in providing such care to deaf people.

In a review of 163 published research papers related to videoconferencing, Hilty and colleagues (2002) concluded that TMH has the potential to bring "enormous opportunities for clinical care, education, research, and administration," and that telepsychiatry is "generally feasible, offers a number of models of care and consultation, in general satisfies patients and providers, and has positive and negative effects on interpersonal behavior" (p. 527).

TMH can improve access to and links between patients, professionals, and academics. The points of service include clinics, patients' homes, and prisons, though in theory they are limitless. However, there does need to be some consideration of issues related

to acceptability, reliability, and affordability. Cukor and colleagues (1998) highlight the need to explore the effects of TMH on communication and interpersonal behavior.

The use of new technology, including that needed for TMH, is dependent on a number of factors, including training and personal and professional experience with technology. In the present article, we limit discussion to the issues of access to and confidence in the use of TMH. In another article, we concentrate on the attitudes and beliefs of clinicians who use TMH in their work (Austen & McGrath, 2006).

There are three specialist services for deaf people with mental health problems in the United Kingdom. The closer a patient lives to one of these services, the more comprehensive that patient's treatment is likely to be, with those farthest away receiving either limited care or no care at all. Because many deaf people have additional disabilities (Crocker & Edwards, 2004), limited life experience, or limited funds, all of which make independent travel difficult, clinicians often find themselves traveling long distances to see their clients. This has implications for the cost (time spent traveling and time away from the base, traveling expenses) and effectiveness of service (visits may be infrequent; the clinician must manage without all of his or her books, equipment, and multidisciplinary colleagues), as well as clinicians' safety (clinicians must spend long hours on the road when they may be tired, go to isolated places, and work without immediate backup from colleagues).

The use of TMH in deaf services in South Carolina has been described by Craft (1996), and its use in York, England, by Davidson (2005). Application of TMH in general services is far more common. Examples include its use in a psychogeriatric service in Hong Kong (Kwong Tang, Chiu, Woo, Hjelm, & Hui, 2001) and in a behavioral health service in Michigan (Whitten & Rowe-Adjibogoun, 2002). Pollard (1999), in particular, promotes the benefits of TMH to deaf services.

Given the pressure on deaf mental-health services to provide expertise across vast geographical areas, the visual nature of sign language and the boost to communication that technology has afforded deaf people, we hypothesized that deaf individuals working in deaf mental-health services would be more experienced in and enthusiastic about TMH than their hearing counterparts, and likewise more experienced and enthusiastic than their presumably predominantly hearing counterparts in general mental-health services. We therefore decided to have a control group of service providers in general mental-health services.

Hypotheses

We developed three specific hypotheses:

H1. Mental health professionals do not have access to TMH.

H2. Mental health professionals in deaf services will have used TMH more and be more confident about using TMH than mental health professionals in general services.

H3. Deaf people will have used TMH more than hearing people and be more confident using it.

Methodology

Questionnaires were devised to elicit information about participants' demographic characteristics, experience of TMH, and subjective level of confidence regarding TMH use. The questionnaires were sent to the three national centers for deaf people with general mental-health problems and the two forensic services for deaf people in the United Kingdom. Each service was asked to distribute equal numbers of questionnaires to its staff and to staff of an equivalent general service within the mental health trust. (In British health care, a *trust* is an organization that manages and finances a circumscribed number of health or mental health services.) The response rate was, unfortunately, impossible to calculate, as some services made the questionnaires available to all staff, whether in general or deaf services, via hospital intranet.

Initially 106 questionnaires were returned, only 8 of which were from deaf or deafened staff. This made some statistical comparisons with hearing staff unviable. There are proportionately fewer deaf staff than hearing staff in the three national centers and two forensic services for the deaf; furthermore, much has been written about the difficulties of involving deaf people in research (Pollard, 2002). Deaf staff may have been offered the questionnaire and then, for a number of reasons, chosen not to complete it. For instance, many deaf people have a lower reading age than is required by many written questionnaires. Also, a lack of experience resulting from paucities of opportunity and education may make deaf people reticent to get involved in others' research. Alternatively, it may have been that, for reasons of access, fewer questionnaires were handed out to deaf people by their team leaders. Assuming that the latter was more likely to be true, we re-sent the questionnaires specifically to the deaf staff in each of the services and centers. This time, we received responses from 30 deaf staff in a total sample of 134.

Participants

Of the 134 people who filled out and returned the questionnaire, 78 (58.2%)

worked in deaf mental-health services and 56 (41.8%) in general mental-health services. The two largest groups of respondents were nurses (n = 33, 24.6%) and psychologists (n = 30, 22.4%). Other respondents were nonclinical personnel (e.g., administrators and cleaners; n = 16, 11.9%), social workers (n = 12, 9.0%), psychiatrists (n = 11, 8.2%), occupational therapists (n = 9, 6.7%), other therapists (n = 9, 6.7%), communication specialists (n = 7, 5.2%), and managers (n = 5, 3.7%). Two respondents did not supply a job title. Ninety-nine participants reported the age group to which they belonged; most of those who gave their age said they were between 26 and 45 years old (see Table 1).

Table 1
Age Distribution of Participants

Age (years)	*n*	*%*
16–25	7	5.2
26–35	30	22.4
36–45	35	26.1
46–55	21	15.7
56–65	6	4.5
Not provided	35	26.1

N = 134.

In regard to audiologic status, most respondents described themselves as hearing (n = 93, 69.4%). Others classified themselves as deaf (n = 29, 21.6%), deafened (n = 2, 1.5%), or "other" (n = 6, 4.5%). (Although this was not specified, we surmised that the participants who ticked the "other" box either strongly identified themselves as something other than deaf or hearing, such as partially deaf or partially hearing, or experienced audiologic difficulties deriving from a nonaudiologic etiology, e.g., multiple sclerosis.) Four participants (3.0%) did not tell us their audiologic status. For the purposes of comparison, these groups were regrouped around identity. The result was two new categories, hearing (n = 98, 73.1%) and deaf/deafened (n = 31, 23.1%). Five participants (3.7%) were not placed in either category. In the rest of the present article, the two categories are referred to as "hearing" and "deaf." (Percentages do not total 100 in some cases because of rounding.)

Confidence Measures

Participants were asked to rate their subjective confidence in their use of videoconferencing and of videophones on a 10-point Likert scale, with 0 indicating the least confidence and 10 the greatest confidence. They were asked to report how confident they felt in both their professional and personal experience with the two technologies. Definition of "professional" and "personal" were not given; participants were considered able to understand and distinguish between the two concepts.

Results

Hypothesis 1: Mental Health Professionals Do Not Have Access to TMH

The first hypothesis concerns access to TMH facilities and considers videoconferencing and videophones separately. In this context, "access" was measured by (a) knowledge about the TMH facility (location and whether colleagues used it) and (b) physical access (proximity and whether one was allowed to use it).

Staff from both deaf and general services were asked about videoconferencing access. A large majority of respondents, 109 (81.3%), indicated that they knew what videoconferencing was. Twenty-three (17.2%) said they did not; 2 responses (1.5%) were missing. Only 16 respondents (11.9%) had used videoconferencing before; 117 (87.3%) had not, and 1 response (0.7%) was missing. Only 32 individuals (23.9%) thought that others in their field used videoconferencing, whereas 90 (67.2%) thought they did not. One respondent (0.7%) did not know, and 11 responses (8.2%) were missing. Thirty-two respondents (23.9%) knew the location of the nearest videoconferencing facility, but the great majority, 101 (75.4%), did not; 1 response (0.7%) was missing. Distances (expressed in minutes) from participants' usual workplace to the nearest videoconferencing facility, for those who knew its location, are displayed in Table 2. Half of these 32 respondents were more than 10 minutes from the nearest videoconferencing facility.

Table 2
Distance to Nearest Videoconferencing Facility

Distance (expressed in minutes)	*n*	*%*
< 5	6	18.8
6–10	6	18.8
11–15	5	15.6
16–20	6	18.8
26–30	3	9.4
> 30	2	6.3
Not provided	4	12.5

N = 32 (number of respondents who said they know the location of the nearest videoconferencing facility).

Among those participants who knew the location of the nearest videoconferencing facility, 50% (n = 16) said they were allowed to use it, 9% (n = 3) said they were not allowed to use it, and 38% (n = 12) did not know if they were allowed to use it. Information was missing for one individual (3%).

Participants working in deaf services (n = 78) were asked to respond to the same questions again regarding their videophone experience. Forty-one respondents (52.6%) indicated that they knew what a videophone was. Six (7.7%) said they did not know, and 31 responses (39.7%) were missing. Seventeen individuals (21.8%) had used a videophone before and 32 (41.0%) had

not; 29 responses (37.2%) were missing. Twenty-two respondents (28.2%) thought that others in their field used a videophone and 21 (26.9%) thought they did not; 35 responses were missing (44.9%). Twenty-seven respondents (34.6%) knew the location of the nearest videophone facility and 20 (25.6%) did not; 31 responses (39.7%) were missing. Distances (in minutes) from participants' usual workplace to the nearest videophone, for those that knew its location, are shown in Table 3. Nearly three quarters of these 27 respondents indicated that they were 5 minutes or less from a videophone facility.

Table 3
Distance to Nearest Videophone Facility

Distance (expressed in minutes)	*n*	%
< 5	20	74.1
6–10	1	3.7
11–15	1	3.7
16–20	0	0
26–30	1	3.7
> 30	0	0
Not provided	4	14.8

N = 27 (number of respondents who said they know the location of the nearest videophone facility).

Among the 27 participants who knew the location of the nearest videophone facility, 85.2% (n = 23) said they were allowed to use it, none said they were not allowed to use it, and 11.1% (n = 3) did not know if they were allowed to use it. Information was missing for 1 individual (3.7%).

Hypothesis 2: Mental Health Professionals in Deaf Services Will Have Used TMH More and Be More Confident About Using TMH Than Mental Health Professionals in General Services

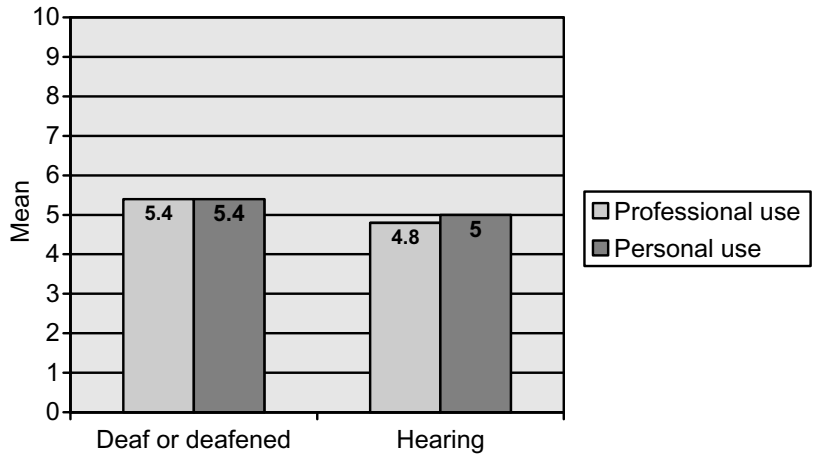
Overall, mean confidence about using videoconferencing professionally was 4.88 (SD = 2.54, n = 123) on a 1–10 Likert scale; mean confidence about personal use was 5.14 (SD = 2.56, n = 116). Mean confidence about using a videophone professionally was 4.89 (SD = 2.67, n = 47); mean confidence about personal use was 4.73 (SD = 2.63, n = 43). Pearson's product-moment correlation and Student's t test were used in comparisons of confidence ratings for videoconferencing and videophone use. It was found that there was no significant difference in the overall confidence rating for each technology between professional use, $t(41) = -0.471$, $p = .640$, and personal use, $t(38) = -1.289$, $p = .205$, and that the ratings correlated significantly for both professional use, $r = .677$, $p < .01$, and personal use, $r = .754$, $p < .01$.

Because staff working in general mental-health services were not asked about videophones, only the figures for videoconferencing are used in comparisons between staff working in deaf mental-health services and those working in general mental-health services. Of the 16 participants who had previously used videoconferencing, 10 were from deaf services. A chi-square test showed no difference between the proportion of individuals who had used videoconferencing in deaf services and the proportion who had used videoconferencing in general services, $\chi^2(4, N = 133) = 0.158$, $p = .691$. Also, t tests did not indicate any differences in mean confidence between deaf services staff and general services staff in regard to either professional use of videoconferencing, $t(121) = -0.455$, $p = .650$, or personal use, $t(114) = 0.368$, $p = .713$).

Hypothesis 3: Deaf People Will Have Used TMH More Than Hearing People and Be More Confident Using It

Of the 16 participants who had previously used videoconferencing, 4 were deaf. Chi-square analysis showed no significant difference in numbers of deaf or hearing respondents who had used videoconferencing, $\chi^2(4, N = 128) = 0.025$, $p = .875$. A similar result was obtained for videophone use, $\chi^2(4, N = 49) = 0.970$, $p = .325$. Comparisons were made regarding confidence in videoconferencing and videophone use both professionally and personally, according to whether or not respondents were deaf or hearing. No significant differences were found when we compared deaf and hearing individuals' confidence ratings regarding videoconferencing use, either profes-

Figure 1
Mean Confidence Ratings for Videoconferencing, by Audiologic Status



Note. Participants self-evaluated using a 1–10 Likert scale.

sionally, $t(117) = 1.247$, $p = .220$, or personally, $t(109) = 0.566$, $p = .574$. However, t tests did indicate that, for videophone use, deaf participants were more confident than hearing participants both professionally, $t(45) = 5.954$, $p = .000$, and personally, $t(41) = 3.752$, $p = .001$. Descriptive data are shown in Figures 1 and 2.

Additional Analysis

We did t tests to determine if there were differences in confidence ratings according to whether or not participants had used videoconferencing or a videophone. It was found that those who had used videoconferencing professionally were more confident than those who had not, $t(121) = -4.125$, $p = .000$. In the personal realm, results approach significance when confidence ratings for those who had used videoconferencing previously are compared with the ratings of those who had not, $t(114) = -1.805$, $p = .075$. Mean group scores are provided in Figure 3.

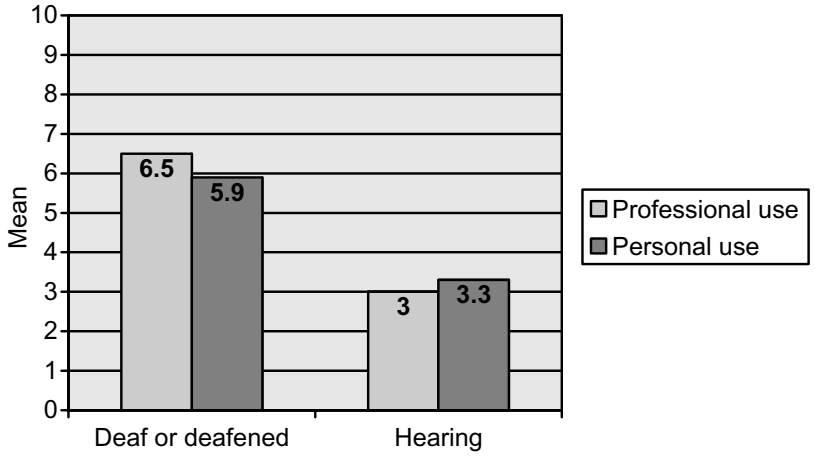
No significant differences were found when we looked at confidence about using a videophone professionally, $t(39) = -1.159$, $p = .254$, or personally, $t(35) = -0.810$, $p = .423$. Mean group scores are provided in Figure 4.

Discussion

The results of the present study can be summarized in seven statements:

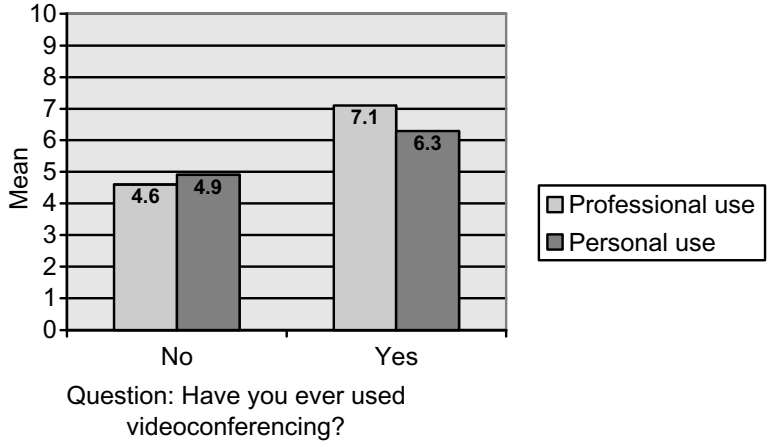
- Neither mental health staff in deaf services nor those in general services appeared to have adequate access to TMH.
- Staff in deaf services were not more experienced or confident in using videoconferencing than staff in general services.
- Deaf staff were not more experienced or confident in using

Figure 2
Mean Confidence Ratings for Videophone Use, by Audiologic Status



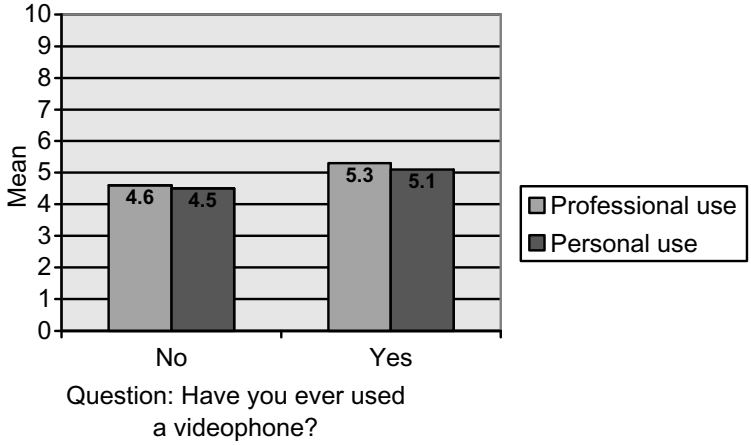
Note. Participants self-evaluated using a 1–10 Likert scale.

Figure 3
Mean Confidence Ratings for Videoconferencing, Based on History of Use



Note. Participants self-evaluated using a 1–10 Likert scale.

Figure 4
Mean Confidence Ratings for Videophone Use, Based on History of Use



Note. Participants self-evaluated using a 1–10 Likert scale.

videoconferencing than hearing staff.
- Deaf staff were not more experienced in videophone use than hearing staff.
- Deaf staff were more confident than hearing staff with videophones both professionally and personally.
- Staff who had used videoconferencing before were more confident, but staff with prior videophone experience were not significantly more confident.
- Staff who were confident with one type of TMH tended to be confident with the other type of TMH. The same held true for lack of confidence.

Contrary to what was expected, individuals working in deaf services did not have better access to TMH than those working in general services. Deaf services tend to cover greater geographical areas, and service providers work with clients who value a visual medium of communication. Thus, it seemed appropriate to assume that these service providers would have better access to, be more experienced with, and be more confident with TMH than general service providers, but this was not the case. The numbers of participants who had not used either videoconferencing or videophones were large, and perhaps there were more similarities than differences between staff in deaf services and staff in general services. Access to videoconferencing was certainly similarly poor for both type of services. The human factors (beliefs, anxieties, attitudes) affecting TMH use also warrant exploration.

Videophones were more accessible than videoconferencing, but the availability of videophones was assumed to be restricted to deaf services. In retrospect, it would have been preferable to measure rather than assume this, and future studies should include information from all participants for both videoconferencing and videophone use. It was interesting to note that despite the availability of anecdotal information that all of the deaf services in the United Kingdom have videophones that are accessible to all staff regardless of audiologic status, the proportion of participants who were aware that they had such access was very small. Videophone facilities tend to be much closer geographically than videoconferencing; that is, about 74% of deaf services staff were found to be less than 5 minutes away from the nearest videophone. However, within deaf services, about 65% of staff who gave a response reported never having used a videophone.

It is interesting, but perhaps not surprising, that confidence in using videoconferencing was significantly linked to previous use. Adaptation to new technology occurs by using it regularly until it no longer feels new. All technological advances require an adjustment period. For example, when the first trains were introduced, it was widely believed that they would cause riders' lungs to explode; when airplanes began to be used, there was widespread fear that they would drop from the sky without warning. More recently, it was some time before most people became comfortable leaving messages on telephone answering machines. In the present study, this need for regular exposure in order to reduce anxiety was perhaps less likely to be met, given the distances many of the participants had to travel in order to use videoconferencing: Fifty percent indicated that they were more than 10 minutes from the nearest videoconferencing facility.

Given that those who had not previously used videoconferencing had less confidence than those who had used videoconferencing, there is a real need for staff to be exposed to and become experienced with videoconferencing. For this reason, time and resources will need to be invested in further training and discussion before clinicians will be prepared to use videoconferencing as a regular part of their direct client or nonclient work. Training in the use of one type of TMH would be likely to produce benefits across the board with other types of TMH, as we have seen that confidence levels with the two types of TMH in the present study correlate significantly. Thus, investment in training in the use of one type of TMH may be sufficient to give staff confidence in using other types.

Interestingly, previous videophone use did not ensure higher confidence. This outcome may vary with frequency or duration of use rather than on the basis of whether one has used a videophone. It is known from cognitive behavioral therapy that prolonged exposure to a source of anxiety is required before one experiences the positively effects of desensitization. Anecdotally, it seems that videoconferencing is used for longer pieces of work than videophones. Thus, where a single instance of videophone use might not be of sufficient duration to affect confidence levels, a single (possibly longer) use of videoconferencing would be. It may be worthwhile to explore whether there are differences in lengths of time taken to adjust to new technologies in the future.

Overall, deaf staff were no more confident than hearing staff in using videoconferencing. However within deaf services, deaf staff were significantly more confident than hearing staff about using videophones, both professionally and personally. It seems that within the services surveyed, videoconferencing is considered a novel medium for communication and is somewhat out of reach of all staff,

whether deaf or hearing. The videophone, on the other hand has been a common part of deaf society for many years. As to why deaf staff are significantly more confident in using it than hearing staff is perhaps a factor of the videophone being a workplace necessity rather than one of many communication media options. If all voice telephones were replaced with videophones, it is likely that hearing staff would soon develop more confidence in using videophones.

Conclusion

Subjective predictions of the benefits of using TMH in general and specialist deaf mental-health services are easy to generate. Yet despite talk of TMH saving time and money and improving the lot of both client and staff, it seems from the results of the present study that it not being used as often or by as many people as anticipated. By investigating TMH use and staff confidence about using TMH, the present study has revealed possible obstacles to uptake of TMH services.

While some clinicians are encouraged by their managers to use TMH in order to save money and traveling time, resources may be needed to provide easy access to the equipment, training, time for staff to desensitize themselves to the new technology, and technical backup to facilitate the desensitization process. Because successful single trials or short pilot projects may not sufficiently project the costs of longer-term use of TMH, further exploration of the financial costs of long-term TMH use is needed. In the light of anxiety levels associated with the use of TMH, it is important that staff have the opportunity to practice using the equipment. It is likely that a further exploration of attitudes and beliefs about TMH that affect its uptake would be helpful.

Finally, it is clear that the stereotypes that generated the hypotheses need to be tempered. While deaf people were more confident using videophones than hearing individuals, they were not found to be more experienced or confident in using TMH across the board. While technological innovations have improved the communication possibilities of many deaf people, this does not mean that deaf people are exempt from the difficulties associated with gaps in experience, or anxieties about novel material.

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