

# A Pilot Study of the Effects of S-LP Practicum Students on Service Delivery

## Une étude pilote sur les effets de la présence d'étudiants en orthophonie sur la prestation des services

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### ABSTRACT

The purpose of this pilot study was to lay the foundation for further investigation of speech-language pathology students' impact on service delivery in the institutions in which they do their clinical training. The participants were 11 speech-language pathologist (S-LP) supervisors and their 11 S-LP student interns in final, full-time practicum placements. Data related to patient care and non-patient care (research, institutional, and community service) activities were obtained from the Speech/Language Pathology and Audiology Workload Measurement System (WMS; 1988) computer database. Four 2 x 2 mixed analyses of variance (ANOVA) were used to determine the effects of student presence and two indices of supervisor experience on the amount of patient care and the amount of non-patient care activities. Results indicated that students were not a liability in terms of patient care and were an asset in terms of non-patient care. Results are discussed in terms of their limitations and their potential implications for service delivery and for future research.

### ABRÉGÉ

Le but de cette étude pilote était de jeter la base pour une enquête ultérieure sur l'incidence de la présence d'étudiants en orthophonie sur la prestation des services dans les établissements où ils effectuent leur formation clinique. Les participants comprenaient orthophonistes-superviseurs et leurs 11 internes étudiants effectuant leurs derniers stages pratiques à temps plein. Les données portant sur les soins aux patients et sur les autres activités (recherche, service en établissement et en communauté) ont été obtenues de la base de données Informatisée du *Speech/Language Pathology and Audiology Workload Measurement System (WMS; 1988)*. Quatre analyses mixtes de variance (ANOVA) ont été utilisées pour déterminer les effets de la présence des étudiants et deux indices d'expérience de supervision sur la somme des activités portant sur les soins aux patients et sur les autres aspects. Les résultats montrent que les étudiants n'avaient pas une incidence négative sur les soins aux patients et qu'ils avaient une incidence positive sur les autres activités. Les résultats sont examinés par rapport à leurs limites d'application et à leur signification vis-à-vis de la prestation des services et de recherches ultérieures.

### KEY WORDS

clinical education • supervision • productivity • cost-benefit • patient care

It is essential that clinical facilities provide practical experiences for speech-language pathology students. Classroom education, even when combined with an on-site clinic, is unable to provide the breadth and depth of training necessary to create competent new professionals. The demanding nature of the clinical education process has been made more challenging by recent health care funding cutbacks and restructured service delivery paradigms that have created a heavier workload for speech-language pathologists (S-LPs). It is increasingly important that professionals be accountable with regard to their ability to provide efficient, high quality patient care. If there is a perception in public sector health care facilities that students jeopardize patient care, then those facilities have every right to re-assess their commitment to student training. In privatized health care facilities, where costs

are often monitored even more closely, professionals' willingness to accept students may be further eroded. In general, regardless of setting, it seems safe to assume that when professionals believe students decrease their productivity level by being a drain on time and resources, those professionals are likely to decrease the number of practicum placements they offer each year. Each time this happens fewer practicum options exist for students. With fewer options available, universities are constrained in their ability to produce graduating therapists with the knowledge and confidence to go directly from the university to the work place. The issue of whether S-LP students are an asset or a liability for the institutions that participate in their clinical training is rigorously debated. Unfortunately, research necessary to resolve the asset/liability issue has been minimal in the allied health professions. Most related work has come primarily from the physical therapy

profession complemented by a few studies from the occupational therapy profession.

Paradoxically, at the same time the assets and liabilities of students are being debated, budget constraints are causing health care institutions to hire support workers (assistants) as opposed to rehabilitation medicine professionals. Assistants are hired with the belief that they enable more service provision at a lower cost (Hagler et al., 1993; Hagler, Warren, & Pain, 1995). It would seem S-LP students also might increase service provision, especially since they are specifically trained and educated for the speech-language pathology profession. It is noteworthy that S-LP students are not paid and, thus, should be more cost effective than support workers.

The responsibility lies with researchers to provide health care facilities with information that elucidates student impact on service provision. Information gained from this study may benefit clinical service facilities by helping administrators understand the impact of students on time and resources. Findings may also influence academic training programs as they plan for the clinical training process. Eventually, when all the variables are understood, training programs may be able to match student educational level to practicum disorder areas and supervisor level, ensuring that service delivery is complemented, not compromised. Professional associations may also utilize these findings when developing position and policy guidelines.

#### Cost-Benefit Studies

Many of the previous studies that relate to the impact of practicum students on service delivery have been conducted in the United States with a focus on cost-benefit analyses that emphasize the monetary impact on facilities generating revenue from procedural charges (Chung, Spelbring, & Boissoneau, 1980; Gandy & Sanders, 1990; Halonen, Fitzgerald, & Simmon, 1976; Leiken, 1983; Leiken, Stern, & Baines, 1983; Lopopolo, 1984; MacKinnon & Page, 1986; Page & MacKinnon, 1987; Porter & Kincaid, 1977; Ramsden & Fischir, 1970). Historically in Canada, health care institutions have been funded primarily by the individual provinces with complicated preservice grants, rather than by revenue for services rendered. Therefore, cost-benefit studies have, until recently, been less common among Canadian health care facilities.

Cost-benefit studies have taken many forms. Some have examined the cost-benefit issue on a conceptual level; that is, the investigators (Ramsden & Fischir, 1970; Page & MacKinnon, 1987; Gandy & Sanders, 1990) did not attempt to calculate overall financial gain or loss. Instead, they discussed the factors that must be addressed to fully understand the cost-benefit issue. For example, factors such

as institutional fee structures, models for estimating clinical instruction time, and assessment of indirect as well as direct costs and benefits were considered. Two studies (MacKinnon & Page, 1986; Chung et al., 1980) approached the cost-benefit issue in terms of policy. MacKinnon and Page (1986) attempted to establish organizational and monetary policies for program management. Chung et al. (1980) did likewise, concluding that clinical agencies should not expect reimbursement for accepting students nor should universities feel obligated to provide compensation to clinical facilities for taking their students.

Hammersberg (1982) used survey instruments completed by supervisors and staff members of six allied health programs. The surveys required the participants to estimate the amount of time given to the education of students, the cost of supplies, and the contribution of students to the performance of the daily workload. The survey responses were averaged, and the results indicated that the costs of having students outweighed the contribution the students provided.

Findings from studies pertaining to clinical education for physical therapy students have suggested that financial benefits, rather than financial liabilities, accrue for institutions (Leiken, 1983; Lopopolo, 1984; Porter & Kincaid, 1977). Financial benefits also were reported for physical therapy, occupational therapy and radiological technology students by Leiken et al. (1983).

In summary, findings from cost-benefit studies have been conducted in various disciplines and have resulted in contradictory conclusions regarding the impact of students on operational costs. It is possible that these inconsistent findings may relate to differences in the educational and/or institutional practices across disciplines.

#### Productivity Studies

*Benefits for clinicians and employers.* Studies that reduce cost-benefit to a dollar value do not consider the many positive qualitative effects students offer their training facilities. Students are often reported to be challenging and stimulating to their supervisors and other members of their departments. They bring youthful enthusiasm and new ideas with them to their practicum sites, and their presence is often an opportunity for practicum institutions to screen potential future employees (Cebulski & Sojkowski, 1988; Halonen et al. 1976; Leiken, 1983).

*Impact on service delivery.* Perhaps one of the most meaningful indices of student impact on clinical service facilities is the amount of patient/client services. Unfortunately, this measure is not often used. The amount of patient/client service in physical therapy was investigated in acute care hospital environments by Bristow and Hagler (1994, 1997), Cebulski and Sojkowski (1988), Ladyshevsky

(1995), and Ladyshevsky, Bird, and Finney (1994). Cebulski and Sojkowski (1988) found that 72% of the clinical instructor-student pairs in the study were more productive than the same clinical instructors without students. Bristow and Hagler (1994) examined the productivity of physical therapy students during clinical placements and assessed the impact of supervision on professional staff time. Their results indicated that staff members' patient-related, service decreased during periods of supervision but the direct patient care provided by students was greater than the therapists' supervision time. Bristow and Hagler (1997) extended their 1994 study by comparing the amount of service provided by individual staff with no student assignments to the amount of service provided by the same staff in combination with their students. That investigation supported their earlier findings by indicating clinical placements had positive effects on service delivery. Results indicated that the number of patients seen per day significantly increased with students present. Ladyshevsky et al. (1994) examined the impact of physical therapy student placements on outpatient service productivity. They concluded that factors of staffing level, length of waiting list per full time equivalent staff, caseload mix and meeting time, not student factors, had the greatest influence on outpatient service productivity. Ladyshevsky (1995) studied productivity using a collaborative clinical education model in the acute inpatient clinical setting. The findings demonstrated that students increased productivity levels while using the 2:1 supervision model (Ladyshevsky, 1993). Those results were important, because they suggested that students were not a liability when using the collaborative model of supervision. It was judged to be an especially effective educational paradigm, because students were found to be an asset and the hospital was able to provide placements to twice as many students while using the model. The studies by Bristow and Hagler (1994, 1997), Ladyshevsky (1995), and Ladyshevsky et al. (1994) were conducted in Canada and used the Physiotherapy Workload Measurement System (PWMS; Physiotherapy Workload Measurement System, 1988), a statistical database system which produces workload indicators for each staff member and student and was used routinely in larger health care facilities throughout Canada.

*Other variables.* The main concern of productivity research has been to investigate how students affect patient care. However, some productivity studies have considered other variables. Bristow and Hagler (1994, 1997), for example, looked at service areas to see if productivity differed among the different PT service areas in an acute care hospital when students were present. No service areas demonstrated a reduction in amount of service as a function

of having students on site, and the net effect across service areas was a significant increase in client attendances per day when students were present. Cebulski and Sojkowski (1988) indicated that length of internship may affect productivity. They also attempted to explain lower productivity levels from certain supervisor-student pairs by relating it to student/supervisor weaknesses such as short internships, student performance problems, and supervisors' nonwork-related personal difficulties. Their study described the supervisor participants as being chosen from various levels of personnel and did not describe the student educational level. Other studies (Bristow & Hagler, 1994, 1997; Ladyshevsky, Bird, & Finney, 1994; Ladyshevsky, 1995) have attempted to control for students' educational level and practicum experience by matching student participants to achieve sameness across comparison groups in terms of these variables.

Researchers should not only consider the student but should also consider the supervisor. The role of the supervisor is critical. The supervisor is an integral part of the supervisor/student pair. Perhaps productivity is affected as much by supervisor level as by student level, or perhaps they could be interacting with one another to affect the amount of patient care being provided. Ladyshevsky et al. (1994) discovered that other preexisting factors in the physical therapy department, not students, were affecting productivity.

In summary, related research in other professions seems to suggest that students are not a liability to productivity. Now there is a need for further research in all the health sciences disciplines to discover what qualities or mix of qualities of students, supervisors, and internship environments may affect productivity. Supervisor work experience, supervisor supervision experience, and student experience are potentially high-impact variables that deserve attention as independent variables affecting patient care in speech-language pathology.

To date there has been no research in speech-language pathology to assess the impact of students on institutions' productivity levels during the students' practicum experiences. The general findings of the research from other professions, as described above, are that facilities benefit from having students (Bristow & Hagler, 1994, 1997; Cebulski & Sojkowski, 1988; Ladyshevsky, 1995; Leiken, 1983; Leiken et al., 1983; Lopopolo, 1984; Porter & Kincaid, 1977). Therefore, the purposes of this exploratory study were to: (a) provide preliminary information regarding the effects of S-LP students on the amounts of patient care and nonpatient care activities, and (b) point the way for future research that might use more participants having a broad range of experience levels and working in a variety of service delivery settings. This study, the first of its kind

in communication disorders, used the most convenient available setting, a rehabilitation hospital in which several S-LP professionals routinely supervised students. To address the primary purpose, it was hypothesized, based on the collective body of evidence from other professions, that S-LP students would increase institutional productivity. In keeping with the secondary purpose of this study, it was hypothesized that supervisor work experience and supervision experience would affect patient care. The use of three independent variables and two dependent variables resulted in a design that enabled the investigators to address four basic questions:

1. Will supervisor work experience and student presence have independent or interactive effects on amount of patient care?
2. Will supervisor work experience and student presence have independent or interactive effects on amount of nonpatient care?
3. Will supervisor supervision experience and student presence have independent or interactive effects on amount of patient care?
4. Will supervisor supervision experience and student presence have independent or interactive effects on amount of nonpatient care?

## Methodology

### Participants

Participants for this study were 11 pairs of S-LP clinical educators and their students who were in their final, full-time placement in a series of practicum experiences for the University of Alberta's MSLP or BSc programs in speech-language pathology between 1990 and 1994.

**Supervisors.** Supervisor participants were qualified S-LPs working at a large rehabilitation hospital who had one student for at least one month consisting of a minimum of fifteen working days. The same supervisors, on a separate occasion, worked at least one month consisting of a minimum of fifteen working days none of which involved a student assignment. These supervisors were assigned to either a high or low work experience group and to a high or low supervision experience group according to the protocol appearing in Appendix A. The mean number of years of work experience were 14.08 and 3.23 for supervisors in the high and low groups, respectively. The mean number of years of supervision experience were 12.50 and 4.71 for supervisors in the high and low groups, respectively.

**Students.** Student participants were those in final, full-time practicum assignments at a large rehabilitation hospital. The students were supervised for a minimum of 15

days out of 20 working days for one to three months.

### Equipment and Materials

The database system used in this study was the Speech/Language Pathology and Audiology Workload Measurement System (WMS; 1988). This system was used to record patient care and nonpatient care activities in daily hourly totals.

### Procedures

**Data collection.** Through the communication disorders department, the investigators confirmed that the hospital offered placements for MSLP students and BSc students for internships between 1990 and 1994 and had reported their service statistics on a month-end basis with the WMS (Speech/Language Pathology and Audiology Workload Measurement System, 1988). The investigators worked with the hospital S-LP who was responsible for the Audiology and Communication Disorders Departmental statistics and also with the Information Systems staff to acquire the data. The supervisors whose data were used in this study had previously entered their own data on the computer as part of their month-end job responsibilities. Prior to January, 1995, practices at this particular facility emphasized the "patient care" category for statistical data keeping. Use of the "nonpatient care" category was encouraged, but it was not mandatory to specify subcategories of nonpatient care. The number of months for which data were obtained for each level of Student Presence (With a Student and Without a Student) ranged from one to three months. Retrospective monthly data output sheets were generated by the computer system and the relevant information was transferred to the researcher's data summary sheets for analysis. The data indicators used in this study were the hours/day for patient care activities, the hours/day for nonpatient care activities and the days worked per month. Average hours/day of patient care were calculated by dividing total number of patient care hours by total number of days worked to determine the dependent variable, Patient Care. Average hours/day of nonpatient care were calculated for each supervisor-student pair by dividing total number of nonpatient care hours by total number of days worked to determine the dependent variable, Nonpatient Care. Average hours/day for patient care and nonpatient care were calculated for each supervisor with and without a student. It should be noted that average hours/day of patient care and nonpatient care *with a student* were derived from the *combined* hours of care provided by each supervisor/student pair. The 11 participant pairs average daily totals were then averaged together to provide four final average totals for patient care and nonpatient care with and without students present. Please refer to the Appendix for further definition of the depend-

ent variables.

The sampling period varied depending on the student and supervisor involved. Data were obtained for as many months of the internship as met the 15 days criterion for Student Presence as described in the Appendix. The investigator worked with the S-LP in charge of departmental statistics to determine which data could be obtained to best represent service provided by supervisors when students were not present. The S-LP and investigator chose months that met three criteria. First, each month met the same 15-day criterion used for Student Presence; second, each month was equal in caseload to the months with students and third, the supervisors were working in the same programs as when the students were present. The comparison months usually were the months prior to student arrival unless there were unusual circumstances that occurred in the supervisors' schedules.

The two independent variables of Work Experience and Supervision Experience applied only to the supervisor participants. Work Experience was determined by the number of years of full-time equivalent (FTE) work experience the supervisor had as a S-LP at the hospital prior to supervising the student participating in this study. Supervision Experience was determined by the number of students supervised at the hospital prior to having the student with whom they participated in this study. Please see the Appendix for further definition of the independent variables.

**Design.** Use of the above archived information resulted in a retrospective, mixed, causal-comparative design using three independent variables and two dependent variables.

**Variables.** There were three independent variables, Student Presence, Work Experience and Supervision Experience. Student Presence had two levels: (a) With a Student, and (b) Without a Student. Work Experience had two levels: (a) High, and (b) Low. Supervision Experience had two levels: (a) High, and (b) Low (Appendix). Dependent variables were Patient Care and Non-Patient Care.

**Data analysis.** Data analyses were carried out using StatView SE+Graphics (Feldman, Hofmann, Gagnon, & Simpson, 1988) to determine the impact of student presence, supervisor work experience, and supervisor supervision experience on the amounts of patient care and nonpatient care. Questions one through four were answered using four 2x2 mixed analyses of variance (ANOVA) with Patient Care and Nonpatient Care as dependent variables and using either Work Experience or Supervision Experience as a between-groups, independent variable having two levels

and Student Presence as a within-groups, independent variable having two levels.

**Validity.** The validity of these data were assumed on the basis of this study being retrospective and using existing institutional databases. It was believed that crucial funding allocations and service delivery decisions were routinely based on information from these databases and that the data represented actual service with approximate but reasonable accuracy. The WMS has been used across Canada in hospitals since 1988 to produce workload indicators for each staff member. Data for these participants should be reasonably valid in that the data were taken in one hospital from one department between 1990 and 1994. All participants were trained to record statistics in the same manner and all month end statistics were reviewed by the S-LP responsible for the departmental statistics. Also, prior to 1995, students were not entering their own statistics. Statistics were being entered by the supervising professionals and were, thus, less likely to reflect the extreme variability associated with multiple users. As well, all the data were retrospective. Thus, participants were not aware data were being collected for the purposes of this study and, therefore, were unable to have predisposed the outcome based on their own preconceived ideas about the impact of student clinicians.

**Reliability.** All initial calculations of variables were rechecked for mathematical accuracy by an impartial volunteer. Reliable entry of variable calculations for statistical analysis was assured through a volunteer's simultaneous visual monitoring of the investigator's data entry. One hundred percent accuracy of data transfer was obtained.

## Results

**Descriptive statistics.** Descriptive data for Patient Care and Nonpatient Care under the two conditions appear in Table 1.

Table 1. Descriptive Statistics for Number of Hours of Patient Care and Nonpatient Care.

		Mean	Range	Standard Deviation
Patient Care	With a Student	4.810	2.920-8.850	1.743
	Without a Student	4.445	3.240-5.790	0.888
Nonpatient Care	With a Student	1.135	0.390-2.990	0.737
	Without a Student	0.627	0.060-1.720	0.635

**Comparative Statistics.** Four two-way, mixed analyses of variance (ANOVA) were used to answer the research questions.

The two factor analysis of variance (ANOVA) comparing Work Experience and Student Presence for their effects on Patient Care revealed no main effect for Work

Work Experience and Student Presence was found (Table 3).

**Table 2. Mean Number of Hours of Patient Care With and Without a Student as a Function of Supervisor Work Experience.**

		Patient Care With a Student	Patient Care Without a Student	Totals
Work Experience	Low n=7	5.213	4.761	4.987
	High n=4	4.105	3.890	3.997
	Totals n=11	4.810	4.445	4.627

The two factor analysis of variance (ANOVA) comparing Supervision Experience and Student Presence for their effects on the amount of Patient Care revealed no main effect for Supervision Experience,  $F(1,9) = 4.83, p = .06$ , and no main effect for Student Presence,  $F(1,9) = 1.06, p = .33$ . No interaction between Supervision Experience and Student Presence was found  $F(1,9) = 2.29, p = .17$  (Table 4).

Experience,  $F(1,9) = 1.76, p = .22$ , and no main effect for Student Presence,  $F(1,9) = .85, p = .38$ . The mean amount of Patient Care with Student was 4.81 hours per day, and the mean amount of Patient Care without Student was 4.45 hours per day. A significant interaction between Work Experience and Student Presence did not occur  $F(1,9) = .08, p = .78$  (Table 2).

**Table 4. Mean Number of Hours of Patient Care With and Without a Student as a Function of Supervision Experience.**

		Patient Care With a Student	Patient Care Without a Student	Totals
Supervision Experience	Low n=5	5.866	4.912	5.389
	High n=6	3.930	4.055	3.992
	Totals n=11	4.810	4.445	4.627

The two factor analysis of variance (ANOVA) comparing Work Experience and Student Presence for their effects on the amount of Nonpatient Care revealed no main effect for Work Experience,  $F(1,9) = .70, p = .42$ , and a

The two factor analysis of variance (ANOVA) comparing Supervision Experience and Student Presence for their effects on Nonpatient care revealed a significant main effect for Supervision Experience,  $F(1,9) = 9.99, p = .01$ , and a significant main effect for Student Presence,  $F(1,9) = 7.20, p = .03$ . No interaction between Supervision Experience and Student Presence was found  $F(1,9) = .02, p = .90$  (Table 5).

**Table 3. Mean Number of Hours of Nonpatient Care With and Without a Student as a Function of Supervisor Work Experience.**

		Nonpatient Care With a Student	Nonpatient Care Without a Student	Totals
Work Experience	Low n=7	1.150	0.371	0.761
	High n=4	1.210	1.075	1.091
	Totals n=11	1.135	0.627	0.881

significant main effect for Student Presence,  $F(1,9) = 11.97, p = .01$ . The mean amount of Nonpatient Care with students was 1.135 hours per day, and the mean amount of Nonpatient Care without students was .627 hours per day. A significant interaction  $F(1,9) = 5.99, p = .04$  between

amount of patient care and that students neither increased nor decreased the amount of patient care at the rehabilitation hospital.

Results for question #2, which asked whether work experience and student presence had an effect on the amount

**Discussion**

Results for question #1, which asked whether work experience and student presence had an effect on the amount of patient care, indicated that the number of years a supervisor had worked at the hospital did not affect the

**Table 5. Mean Number of Hours of Non-Patient Care With and Without a Student as a Function of Supervision Experience.**

		Nonpatient Care With a Student	Nonpatient Care Without a Student	Totals
Supervision Experience	Low n=5	0.678	0.144	0.411
	High n=6	1.515	1.030	1.272
	Totals n=11	1.135	0.627	0.881

of nonpatient care, indicated that the number of years a supervisor had worked at the hospital did not affect the amount of nonpatient care but that the amount of nonpatient care increased significantly when students were present. This change seemed to be caused entirely by an observable increase in the amount of time spent in nonpatient care by low work experienced supervisors and/or their students. That is, nonpatient care increased for low work experienced supervisors when they had students present compared to when no students were present, but nonpatient care was not affected as a function of student presence for high work experienced supervisors. One basic question arises. Why do students affect low and high work experience S-LPs differently? Table 3 suggests that high work experience supervisors provided relatively high levels of nonpatient care both with and without a student. Low work experience supervisors provided lower levels of nonpatient care without a student but come up to the level of their more experienced colleagues when a student is present. Perhaps more special projects or research were taken on by low work experience S-LPs when they had a student, because they had more time to engage in these activities. Such activities might have occurred when the student was performing direct treatment (especially toward the end of an internship), when the supervisor did not feel a need to observe frequently and consistently. It would be interesting to investigate where nonpatient care time is spent by clinicians at all levels of work experience.

One might question whether significantly increased amounts of nonpatient care are an adequate foundation on which to build the assertion that students were an asset. Unless all nonpatient care time went toward clinical supervision and none went toward non-supervisory nonpatient care (e.g., support services, service to the hospital and community, or research), which is a possibility, students' presence resulted in a net gain in productivity. Only a more detailed accounting of clinicians' worked time would make it possible to distinguish exactly how the additional nonpatient care time was spent.

The most important finding from answering questions

one and two was that even supervisors with low work experience could supervise students without lowering the institution's productivity level for patient care and nonpatient care. Thus, based on findings from this study, students at this institution can be matched with either high or low work experienced supervisors and not be a liability to productivity.

Results for question #3, which asked what the effects of supervision

experience and student presence were on the amount of patient care, failed to reveal any significant effects for these independent variables. The average amount of patient care for supervisors who had low supervision experience did not differ from the average amount of patient care for supervisors who had high supervision experience, and the amount of patient care did not change as a function of student presence. Supervision experience and student presence did not interact to affect the amount of patient care.

Results for question #4, which asked what the effects of supervision experience and student presence were on the amount of nonpatient care, indicated that nonpatient care was higher for high experienced supervisors than for low experienced supervisors and that more nonpatient care service was provided when a student was present than without a student. Supervision experience and student presence did not interact to affect the amount of nonpatient care. It is possible the professionals who had more supervision experience had different work goals for themselves besides providing direct treatment. Another possibility is that the experienced supervisors may have had more diverse work assignments that fell under the definition of nonpatient care (e.g., participating in program research or program support services). Findings for nonpatient care could have been explained in more detail, if nonpatient care data had been coded under more distinct headings.

These findings are important for the speech-language pathology profession for two reasons. One, they are the only hard data in the field of communication disorders, and two, they corroborate the findings from other professions which indicate that students, during their clinical training, do not have negative effects on the amount of patient service (Bristow & Hagler, 1994, 1997; Cebulski & Sojkowski, 1988; Ladyshewsky, 1995; Leiken, 1983; Leiken et al., 1983; Lopopolo, 1984; Porter & Kincaid, 1977).

### *Limitations*

Findings from this study should be interpreted with extreme caution. Taken at face value, they lead us to conclude that students maintained the amount of patient care

and increased the amount of nonpatient care at this particular rehabilitation hospital. Patient care was not affected by having students present, and this did not change as a function of supervisors' level of work experience or supervision experience. Nonpatient care increased when students were present, and nonpatient care was higher for high supervision experienced supervisors than for low supervision experienced supervisors. It is important to note that this difference in nonpatient care was evident with or without students. That is, it was not a function of having students on site.

It is noteworthy that the statistical analyses used to answer the four research questions were not independent of one another. In such circumstances, there is always an increased possibility that any observed differences are attributable to chance. A corrected alpha level of .0125 (.05/4 analyses) would have resulted in reporting no significant interaction between work experience and student presence on nonpatient care and no significant main effect of student presence on nonpatient care (in one analysis but not in the other). To have taken such a conservative approach in an exploratory study might have led to conclusions of *no effect* in instances where some potentially interesting cause/effect relationships were actually present and therefore a worthwhile focus for future investigations. It is also noteworthy that the variables of work experience and supervision experience that were treated as independent in this investigation were, in fact, likely related to one another insofar as supervisors who were high on one would tend to be high on the other. However, by separating them, it was possible to look for a differential impact which, as it turned out, they seemed to have. Work experience had no effect on either patient care or nonpatient care, while supervision experience had an effect on nonpatient care but not on patient care. These findings suggest that this institution need not be concerned with pairing students with supervisors who have supervision experience in order to maintain patient care, however the observed increase in nonpatient care by experienced supervisors raises questions about where supervisors' nonpatient care time is going.

Another limitation of this study was that work experience and supervision experience could only be based on the number of years worked and the number of students a supervisor had supervised since their start date at this rehabilitation hospital. As this was a retrospective study, many of the supervisors were no longer working at the institution. Thus, it was impossible to acquire their previous employment and supervision history.

A number of limitations were inherent in use of the WMS. One problem with the WMS data used in this particular study was that they were four to eight years old.

The 1998 healthcare system is significantly changed. With governments' increasing demands for more careful accountability and increasing focus on costs of health services, it is reasonable to believe that similar data collected today might reflect in greater detail and in cost-related terms how clinical professionals spend their time both with and without students. Similarly, changing models of service delivery such as patient-focused, transdisciplinary programs, shared supervision by multiple supervisors, rotating service to special programs, and redefined service mandates may limit the applicability of these findings, even to the same rehabilitation hospital today. Generalization to service facilities other than rehabilitation hospitals would be questionable, even in the absence of a radically changing healthcare system. A third problem with the WMS data was that they did not capture everything the students and their supervisors were doing in terms of service. The WMS was designed to capture work hours only. It is likely that supervisors put in extra hours that did not appear as patient or nonpatient service. If one examines the average number of hours of patient care plus nonpatient care per day for clinical professionals without a student and divides that number by the number of hours worked per day (assuming a 7.5-hour workday for each staff member) it is apparent that these WMS data represent only about 68% of the professionals' worked time. Nonpatient care was the most inconsistently tracked code, probably because tracking under more specific headings was not mandatory prior to January 1995. Originally, the investigators set out to analyze how much nonpatient care was given to clinical instruction/teaching, but this could not be done because nonpatient care was not recorded consistently under the more specific code of clinical instruction/teaching. The WMS has been modified in the intervening years to better address the need to track these variables. If a similar study could be repeated prospectively, nonpatient care could be analyzed in more specific terms of how supervisors' time is spent. A prospective study would have two advantages. It would enable the investigators to see if productivity would change by comparing results of this study with results of previous retrospective productivity studies carried out in physical therapy (Bristow & Hagler, 1994, 1997; Cebulski & Sojkowski, 1988; Ladyshevsky, Bird, Finney, 1994; Ladyshevsky, 1995). As well, it would allow the creation of subcodes specifically for students and supervisors that would enable the investigator to discover where nonpatient care time was being utilized. A final limitation with the WMS, and one that likely always will exist, is that it measures quantity, not quality of patient care.

#### *Future Research*

Future research may need to test for an interaction between work experience and supervision experience to as-

certain whether they combine with student presence to affect service delivery. A test for this possible interaction was attempted for this study. However, a three-way ANOVA reduced the number per cell so low that the appropriate statistical procedure could not be applied. A three-way ANOVA of this type could be used in a future study involving more participants.

Another important variable to be considered for future research is student experience. These student participants were in their final, full-time clinical placement. It would be useful to observe the level of productivity across different levels of student experience to see if differences are observable. If it could be determined that junior level students decrease productivity, then institutions and universities would need to cooperate in developing supervision models and practicum experiences to accommodate beginning students without compromising service delivery.

If more research of this type can be done in other work settings such as schools, special schools, acute care hospitals, health clinics, and private practices, either with more recently collected WMS data or with prospective data collection and, if possible, include some measure of quality of patient care, a more thorough understanding of exactly how practicum students affect patient care can be provided. The cumulative knowledge from additional work of this type would help guide clinical institutions and academic training programs, as they negotiate and plan for the clinical education process.

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## APPENDIX Variables

### 1.0 INDEPENDENT VARIABLES

#### 1.1 Student Presence (two levels)

1.1.1 "With a Student": A month during which a supervisor had a student for at least 15 days out of 20 working days in that month.

1.1.2 "Without a Student": A month during which a supervisor had a student for zero days out of 20 working days in that month.

#### 1.2 Supervisor Work Experience (two levels)

1.2.1 High: A supervisor who had worked a full-time equivalent (FTE) as a S-LP for eight or more years at the hospital.

1.2.2 Low: A supervisor who had worked a full-time equivalent (FTE) as a S-LP for seven or less than seven years at the hospital.

#### 1.3 Supervisor Supervision Experience (two levels)

1.3.1 High: A supervisor who had supervised six or more students at the hospital prior to supervising the student in this study.

1.3.2 Low: A supervisor who had supervised five or less students at the hospital prior to supervising the student in this study.

### 2.0 DEPENDENT VARIABLES (Adapted From Speech/Language Pathology and Audiology Workload Measurement System, 1988)

There were two dependent variables: Patient Care and Nonpatient Care.

#### 2.1 Patient Care: Average hours/day

2.1.1 Patient Care: All services and/or activities provided to or on behalf of a registered patient.

Patient Care example activities:

- preparation or planning time
- file review
- assessment
- treatment
- meetings and/or conferences
- counseling
- documentation
- report writing
- selection and evaluation of devices/resources/materials
- education of patient/family/guardians

#### 2.1.2 Derivation of Patient Care

Patient Care was recorded in hours/day of patient care.

- Calculation: Patient Care divided by total number of days worked.
- Patient Care was collected at two different points in time: (a) when a supervisor did not have a student and, (b) when a supervisor did have a student.

#### 2.2 Nonpatient Care: Average hours/day

2.2.1 Nonpatient Care: Activities required for the operation and/or maintenance of the speech/language pathology department and for the benefit of the department staff.

Nonpatient Care example activities:

- clinical supervision
- support services
- service to hospital and community
- research

#### 2.2.2 Derivation of Nonpatient Care

- Nonpatient Care was recorded in hours/day of nonpatient care.
- Calculation: Nonpatient Care divided by total number of days worked.
- Nonpatient Care was collected at two different points in time: (a) when a supervisor did not have a student and, (b) when a supervisor did have a student.