Undergraduate Speech-Language Therapy Students' Perceived Competence to Treat Persons Who Stutter Following an Additional Training Component Using a Simulated Patient

by
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DECLARATION

I, the undersigned, hereby declare that the work contained in this assignment is my original work and that I have not previously submitted it, in its entirety or in part, at any university for a degree.

Signature: _____

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ABSTRACT

Purpose: Globally, too few speech-language therapists (SLTs) address fluency disorders. This may be related to their feeling of incompetence in managing persons who stutter (PWS). In the South African context, newly graduated SLTs often do not have access to support and guidance from experienced clinicians to develop their skills and competency in managing PWS. The aim of this study was to explore and describe undergraduate SLT students' perceptions of their own competence to manage PWS 1) directly after completion of their theoretical module and before clinical placement, and 2) after exposure to an additional training component where they observed the application of intervention procedures on a simulated patient. **Methods**: A descriptive survey design, using pre- and post-intervention questionnaires, was utilised to evaluate the androgogical approach's impact on students' perceived competence before and after they had received the additional training component. **Results**: Prior to the intervention, the majority of the SLT students did not perceive themselves to be competent to evaluate or treat PWS. Post intervention, statistically significant changes in the students' perceived competence were reported for the majority of aspects related to the evaluation and treatment of PWS. **Conclusion**: It was concluded that students highly value this type of innovative teaching methodology and it is a much-needed supplement to students' existing clinical placements.

Key words: stuttering; clinical learning opportunities; simulated patients

ABSTRAK

Doel: Te min spraak-taalterapeute (STT'e) wêreldwyd spreek vlotheidsversteurings aan. Dit mag aan hul gevoelens van onbevoegdheid in die hantering van persone wat hakkel toegeskryf word. Nuut-gegradueerde STT'e, in die Suid-Afrikaanse konteks, het dikwels nie toegang tot ondersteuning en leiding van ervare klinici om hul vaardighede en bevoegdheid in die hantering van persone wat hakkel, te ontwikkel nie. Die doel van hierdie studie was om voorgraadse STT-studente se persepsies van hul eie bevoegdheid om persone wat hakkel te hanteer, te ondersoek en beskryf 1) direk na die voltooiing van hul teoretiese module en voor kliniese plasing, en 2) na blootstelling aan 'n bykomende opleidingskomponent waar hulle waargeneem het hoe intervensie-prosedures op 'n gesimuleerde pasiënt toegepas word. **Metodes**: 'n Beskrywende opname-ontwerp, met pre- en post-intervensie-vraelyste is gebruik om die andragogiese benadering se impak op studente, voor en nadat hulle die bykomende opleidingsgeleentheid ontvang het, te evalueer. **Resultate**: Voor die intervensie het die meeste studente hulself nie as bevoegd geag om persone wat hakkel te evalueer of behandel nie. Na die intervensie is statisties beduidende veranderinge in die studente se self-ervare bevoegdheid vir die meeste aspekte verwant aan die evaluering en behandeling van mense wat hakkel, gerapporteer. **Opsomming**: Daar is tot die gevolgtrekking gekom dat die studente hierdie tipe innoverende opleidingsmetodologie hoog op prys stel en dat dit 'n nodige aanvulling tot studente se bestaande kliniese plasings is.

Sleutelwoorde: hakkel; kliniese leergeleenthede; gesimuleerde pasiënte

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1. BACKGROUND

Speech-language therapists (SLTs), similar to other professionals within the health sciences, work in increasingly diverse settings characterised by rapid change and complexity, financial restraints and demands for responsibility (Pascoe & Singh, 2008). As stipulated by the Health Professions Council of South Africa (HPCSA) (2009), new SLT graduates are expected to enter the work force competent to treat clients independently. This requires competence in the use of specific intervention procedures and techniques. Undergraduate programmes for SLTs in South Africa are therefore required to equip students with the necessary competencies, enabling them to manage clients effectively directly after graduation.

There has been an increase in demand for the services of SLTs during the past few years (American Speech-Language-Hearing Association (ASHA), n.d.; Popich, 2003) and a significant percentage of the South African population requires speech- and/or language-related services (Gerber, 2009). The precise number or even a reliable estimate is unknown, as epidemiological data regarding the incidence and prevalence of communication disorders in many South African communities is unavailable. International literature reports that approximately 10% of any population is expected to suffer from communication disorders and will benefit from speech-language therapy (Gerber, 2009). In 2009, the mid-year estimate of the total South African population was 49,32 million people (Statistics South Africa, 2009). It can thus be inferred that at least 4,9 million people in South Africa are in need of SLT services. Furthermore, our national prevalence rates are most likely higher than those reported in developed countries. In South Africa there are only 1 542 registered SLTs (HPCSA, 2008) serving a population of 49,32 million people. Most SLTs work in cities and bigger towns and the rural areas are mostly underserviced. There is therefore not only a shortage of SLTs in the country, but also a suboptimal distribution of those.

Student training in fluency disorders
Academic and clinical training of SLT students, specifically in the area of fluency disorders (stuttering, cluttering and related disorders), has been a concern for many years. This is because therapists who have to work with fluency disorders often tend to feel that their training was limited (Brisk, Healey & Hux, 1997; Sommers & Caruso, 1995). Stuttering is defined as speech that is "… characterised by an abnormally high frequency or duration of stoppages in the forward flow of speech. These stoppages, termed core behaviour, usually take the form of a) repetitions of sounds, syllables, or one-syllable words, b) prolongations of sounds, or c) blocks of airflow or voicing in speech" (Guitar, 2006, p. 13). In fluency disorders, the word "disorder" implies that stuttering symptoms comprise many forms. Stuttering has more than one aetiology and it manifests differently in varying age groups and populations, making it a complex disorder (Ratner & Healey, 1999). Clinical management of this complex disorder requires a sound theoretical knowledge of the motor-speech and linguistic processes, the interaction thereof, as well as the psychosocial aspects underlying and maintaining the disorder (Guitar, 2006; Ratner & Healey, 1999). Accurate, up-to-date incidence and prevalence

rates for stuttering are difficult to obtain. Reported data suggests that the prevalence of stuttering is 6,4% (Guitar, 2006). Therefore, approximately 3,14 million South Africans could have a stuttering disorder and benefit from SLT services.

Because of the disorder's variability and idiosyncrasy, individualised treatment is necessary in order for intervention to be successful (Guitar, 2006), particularly in South Africa's multicultural and multilingual context. Since there is a need for diversity in evaluation and therapy in order to understand the presenting fluency problem and address each client individually and holistically based on their needs, the treatment of persons who stutter (PWS) demands a competent therapist. SLTs therefore need a thorough understanding of evaluation instruments such as the Stuttering Severity Index 3 (SSI-3) (Guitar & McCauley, 2010) to accurately identify core and secondary behaviours. To address each client individually and holistically, the treatment of PWS requires application of specific stuttering therapy procedures and techniques to eliminate the core behaviours of the disorder. Specific stuttering therapy techniques include cancellations, pull-outs, flexible speech rate, easy onsets, light contacts, proprioception and voluntary stuttering (Guitar, 2006).

The training in the management of fluency disorders of the students who participated in this study consisted of one 12-credit module at third-year level. The stated aim of the module was to provide the SLT students with theoretical background on the different aspects of fluency disorders, including its biopsychosocial underpinnings and intervention procedures (including evaluation and treatment of various age groups and diagnosis). The learning opportunities and teaching methods for this module comprised formal lectures, self-study from various resources such as web pages and journals, demonstrations by the lecturer and video-material to demonstrate specific procedures and techniques. The module was taught by a full-time senior lecturer with a special interest in fluency disorders and 30 years of clinical experience in the field.

As part of their clinical training programme, these third-year SLT students at Stellenbosch University work under supervision in mainstream primary schools, schools for learners with special educational needs and tertiary level hospital outpatient clinics, where they treat clients and patients for various speech-language disorders. These training sites often do not provide all the students with sufficient opportunities to gain clinical experience in the evaluation and treatment of PWS. Furthermore, they are not always supervised by clinical educators with experience in the management of fluency disorders.

In their fourth year, students spend one morning per week, for nine weeks, at a hospital outpatient clinic where they gain experience in the evaluation of PWS. This clinic is supervised by clinical educators experienced in the management of PWS. It has, however, been acknowledged by the training department that not all SLT students get sufficient experience in treating PWS during their clinical training. Limitations of the outpatient clinic as a training site, such as the availability of

supervisors experienced in treatment of PWS and poor patient attendance, contribute to the lack of clinical learning opportunities. McAllister (2005), reporting on issues and innovations in clinical education, states that it is difficult for training programmes to ensure adequate face-to-face clinical experience for students with both children and adults in clinical case loads such as fluency disorders.

At the beginning of their clinical rotations, the students often find it hard to bridge the gap between theory and practice due to their inexperience and lack of preparedness to cope with the demands of interacting with patients. This can interfere with their ability to maximise learning from the clinical placement (Haskvitz & Koop, 2004; Hill, Davidson & Theodorus, 2009; Weller, 2004).

Kelly, Martin, Baker, Rivera, Bishop, Krizizke et al. (1997) report a link between SLTs' pre-service training, clinical experience, and their willingness to treat PWS. SLTs who report feeling incompetent when treating PWS, often avoid treatment of this population (Sommers & Caruso, 1995). According to Zsilavecz (2010), statistics show that too few SLTs in South Africa address fluency disorders. This may reflect their feeling of incompetence in treating PWS (Curlee, 1985; Kelly et al., 1997; Sommers & Caruso, 1995; Yaruss, 1999) and result in depriving PWS of potentially effective treatment.

In countries such as the United Kingdom and the United States of America, formal mentoring and supervision arrangements are in place to ensure that newly qualified SLTs continue to develop their skills under supervision (McAllister, 2005; Pascoe & Singh, 2008). In South Africa, such mentoring and supervision are seldom available; new graduates commence their compulsory community service year (first year after graduation) mainly in rural communities which are often under-resourced and where they may be the only SLT. During their community service year, they have limited opportunities for support and guidance from experienced clinicians to continue to develop their skills and competence in managing PWS. In South Africa, the lack of support and mentoring opportunities for newly qualified SLTs demands that undergraduate training programmes ensure that students are equipped with the necessary skills and experience before they enter the workplace.

Student teaching and learning
There is an increasing awareness that traditional educational practices (e.g. formal lectures) are no longer enough to meet the needs of diverse student populations (Horton, Byng, Bunning & Pring, 2004; Pascoe & Singh, 2008). Training programmes are required to find innovative ways to facilitate the development of the competencies needed by entry level professionals. One such method to improve training in intervention for fluency disorders is practical sessions in combination with academic coursework (Yaruss & Quesal, 2002). Using simulated patients (SPs) (Dent, 2001; Vardi, 2008) during these practical sessions enables the educator to structure learning opportunities and provide standardised and replicable experiences and learner-centred educational environments. SPs are defined as people who have "been trained to portray accurately the history and physical symptoms of an actual patient" (Chur-Hansen & Burg, 2006, p. 220). "Simulation" in this context

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refers to the "process in a protected environment so that the process mirrors the real procedure in the clinical situation" (Brigden & Dangerfield, 2008, p. 167). SPs have successfully been used in the training of doctors, dentists and nurses for some time and there is an array of literature reporting on this. Except for one study done in the United Kingdom (Syder, 1996), no evidence could be found where SPs have been used in the training of SLTs.

In view of the above, the following research questions arose:

1) Do SLT students, directly after completion of their theoretical module and prior to clinical work in fluency disorders, feel competent to treat PWS?
2) Do SLT students feel competent to use specific evaluation procedures and stuttering therapy techniques taught in the theoretical module?
3) Does the introduction of an additional training component, using SPs, result in improved perceived competence by students to manage PWS?

The broad aim of the study was to explore and describe Stellenbosch University's third-year SLT students' own perceptions of their competence to manage PWS. Two sub-aims delineated the means by which the broad aim of the study was realised. The sub-aims were to explore and describe the third-year SLT students' perceived competence to manage PWS 1) after completion of their theoretical module and before clinical placement, and 2) after the introduction of an additional training component where the students observed the clinical evaluation of a PWS and how specific stuttering therapy techniques were applied in intervention with an SP.

2. METHODS

2.1 <u>Design and sample</u>

The study employed a descriptive survey design, using pre- and post-intervention measurements by means of a questionnaire, to explore the third-year SLT students' perceived competence in the evaluation and treatment of PWS.

A non-probability sampling method of purposive sampling (Creswell, 2009; Maree & Pietersen, 2007; Mouton, 2001) was used to select the participants for this study. All the students (n = 24) in the third-year class of the Baccalaureus in Speech-Language and Hearing Therapy programme at Stellenbosch University were included in the initial sample of the study. The participants were all female and between the ages of 21 to 23. A specific selection criterion stated that participants must have successfully completed the SPH 332 (Fluency Disorders) module in 2010. This selection criterion controlled for confounding variables (Creswell, 2009) by ensuring that all the participants received the same theoretical input by the same lecturer and have had the same general exposure to fluency disorders.

2.2 Selection and training of the simulated patient

Simulation of stuttering requires in-depth knowledge of core and secondary stuttering behaviour. It was deemed unrealistic to train an actor or lay person to portray a PWS convincingly. A qualified SLT with experience in the evaluation and treatment of PWS was invited to participate as an SP in order to demonstrate evaluation and treatment of a PWS in a convincing way.

The training of the SLT to act as SP consisted of the following steps (Rethans, Drop, Sturmans & Van der Vleuten, 1991; Vardi, 2008):

1. Orientation and information regarding the aims of the study and the SP component thereof;
2. Providing the SP with background information (e.g. name, social background, intervention history, etc.) to enable her to portray a specific patient;
3. Selection of the SP's differential diagnosis (i.e. type and severity of stuttering) to enable her to portray a specific patient;
4. Consultation with the lecturer on the learning outcomes of the SP component and how to reach these outcomes in the limited time span;
5. Discussions between the lecturer and the SP regarding the format of the simulated sessions, course of the four sessions, and the compilation of scripts for each session to ensure that the outcomes for each session were reached;
6. Discussions between the lecturer and the SP regarding the portraying of the core and secondary stuttering symptoms and the simulated responses to the therapy techniques.

2.3 Process

The study protocol was approved by the Human Research Ethics Committee of the Faculty of Health Sciences, Stellenbosch University (see Appendix A). Following their successful completion of the theoretical module SPH 332 (Fluency Disorders), informed consent was obtained from all the students in the third-year SLT class. The subsequent research process, comprising three phases, is depicted in Figure 1 and followed by a description thereof.
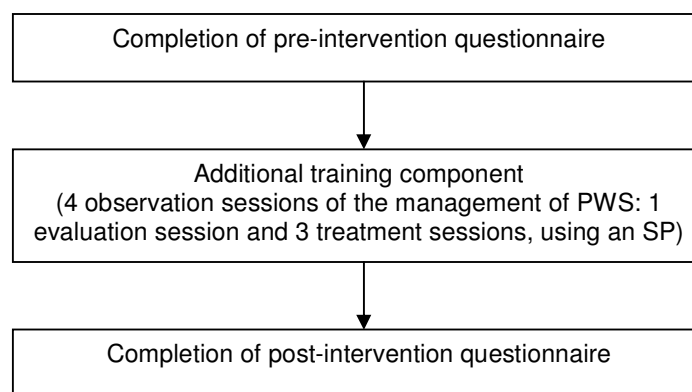

Figure 1: Schematic representation of the three phases of the research process

Phase 1: Pre-intervention data collection

First, an anonymous pre-intervention questionnaire (see Appendix B) was completed by all the participants.

Phase 2: Additional training component using an SP

The week after the students successfully completed the theoretical module, they received an additional training component (one hour per day for four consecutive days) on the evaluation and treatment of PWS. This additional training component comprised four observation sessions during which the lecturer demonstrated 1) the evaluation of a PWS to identify core and secondary behaviours in order to make a differential diagnosis (1 session), and 2) the use and application of specific stuttering therapy techniques (3 sessions), using the SP. During these sessions, the students observed the lecturer either evaluating or treating the SP, who portrayed an intermediate adult stutterer, from behind a one-way mirror. During the observation of the evaluation of the PWS, the students had to analyse the SP's stuttering behaviour and complete the SSI-3 as part of the learning experience. It was decided to spend only one session on evaluation, since the SSI-3 was comprehensively discussed in the theoretical class, and the students had the opportunity to practice using the SSI-3 in class. Prior to each therapy session, the lecturer briefed the students regarding her goals for the therapy session. Subsequent to each therapy session, the lecturer gave a succinct summary of the therapy session's goals and outcomes and time was allowed for questions related to that session.

Phase 3: Post-intervention data collection

At the end of the last observation session, the same anonymous questionnaire was completed by the students. The same questionnaire was used to obtain both pre-intervention and post-intervention data, to enable comparison of the results.

2.4 Data collection

During the data collection process, a concurrent embedded mixed-methods approach (Creswell, 2009; Ivankova, Creswell & Clark, 2007) was adopted. This approach can be identified by one data collection phase during which both quantitative and qualitative data are collected simultaneously, as illustrated in Figure 2 and described subsequently.
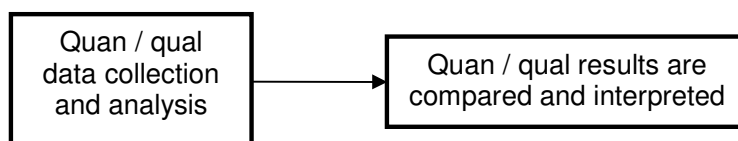

Figure 2: Concurrent embedded design

(adapted from Creswell, 2009; Ivankova, Creswell & Clark, 2007)

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The concurrent embedded mixed methods approach allowed the researcher to collect both numeric and text data concurrently in order to provide a more comprehensive analysis of the research problem (Ivankova, Creswell & Clark, 2007; Creswell, 2009). In this study, the primarily quantitative design (closed-ended questions) embedded some qualitative data (open-ended questions), which sought the participants' views on certain aspects related to their perceived competence to manage PWS.

To enhance *validity*, a customised questionnaire that was based on existing questionnaires in the literature (Brisk et al., 1997; Kelly et al., 1997; Yaruss & Quesal, 2002) was developed specifically for the purpose of this study. Feedback on the questionnaires was anonymous to ensure that true responses were obtained from the respondents. To address *reliability*, the same questionnaire was used to collect feedback from all the respondents.

The questionnaire was piloted on the final-year SLT students for feedback regarding completeness, ambiguity, redundancy and relevance of the questions (Mouton, 2001; Creswell, 2009). This feedback was used to design the final survey instrument and make the necessary adjustments. Two questions were changed to prevent ambiguity and enhance relevance of the questions respectively.

The final version of the survey consisted of three "yes/no" questions which were followed by open-ended questions for elaboration on the chosen answer; nine 5-point scale questions ranging from "least competent" (1) to "most competent" (5); twelve Likert-scale questions ranging from "strongly agree" to "strongly disagree", and a final open-ended question for any additional comments. The questionnaire was organised into four general areas:

- The first area included specific questions regarding participants' perceived competence to manage PWS in general;
- The second area pertained to respondents' perceived competence regarding the stuttering intervention for specific age groups of PWS and types of stuttering;
- The third area focused on participants' perceived competence regarding specific technical skills (i.e. using specific stuttering evaluation procedures and stuttering therapy techniques); and
- The final section addressed participants' needs in terms of what will make them feel more competent to manage PWS.

2.5 Data analysis

The data in this study consists of responses obtained from the completed pre- and post-intervention questionnaires. The sample size varied for one question, because one participant chose not to answer that specific question. No questions were eliminated from the final analysis.

The quantitative and qualitative data were first analysed separately. Descriptive and inferential statistics were utilised for analysis and interpretation of the quantitative questions (including "yes/no" questions, 5-point scale and Likert-scale questions). The McNemar test was used to analyse and test the statistical difference on the "yes/no" questions. Means and standard deviations were computed for responses to each of the 5-point scale and Likert-scale questions, and p-values were calculated for these responses using repeated measures ANOVA (analyses of variance). A 5% significance level ($p<0.05$) was used as guideline for determining significant differences.

Thematic text analysis was used to analyse and interpret the responses to the qualitative questions. In order to prevent interpretive bias, the text was analysed on two separate occasions. Subsequent to thematic analysis of the qualitative data, this data was quantified (Creswell, 2009). The latter involved creating codes and themes qualitatively, then counting their frequency of occurrence in the text. This quantification of the qualitative data enabled the researcher to compare the quantitative and qualitative data and interpret the results obtained (Ivankova, Creswell & Clark, 2007).

3. RESULTS

All the third-year SLT students successfully completed the SPH 332 module (Fluency Disorders) during the first term of 2010 and participated in the study. The sample size was 24 (n = 24).

3.1 Participants' perceived competence to manage PWS in general

The first area on the questionnaire included specific questions regarding participants' perceived competence to evaluate and treat PWS in general. Figure 3 summarises the participants' responses regarding their general competence both before and after the additional training component.
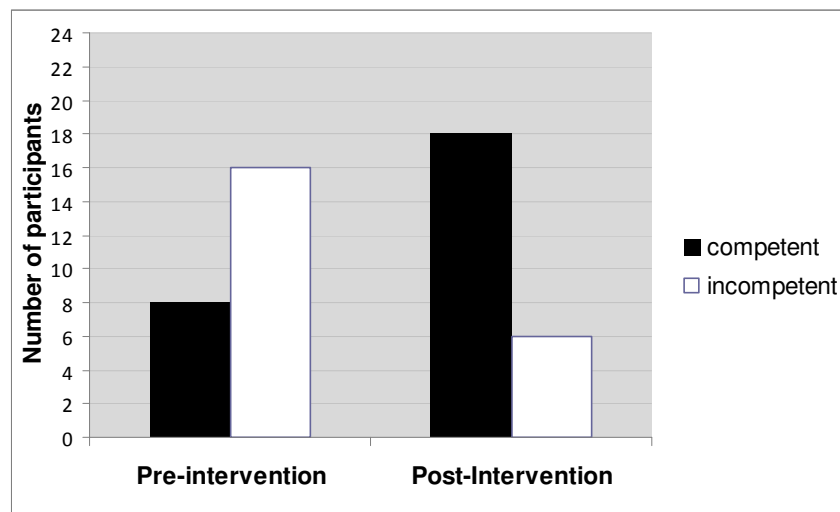

Figure 3: **Participants' (n = 24) perceived competence to evaluate and treat PWS in general**

After successful completion of the theoretical module, only eight (33%) participants perceived themselves as competent to evaluate and treat PWS. In the open-ended section of the question, seven participants (29%) indicated that they first needed to revisit the theory before they would feel competent to treat a PWS, while eight (33%) participants reported that they needed more practical examples and would like to observe therapy sessions before they would feel more competent. Four participants (17%) indicated that they would only feel more confident once they had gained clinical experience, while the same number of participants reported feeling doubtful and scared to treat PWS, since they had never seen or had any contact with PWS.

After observing stuttering therapy with a PWS, using an SP, eighteen (75%) of the same participants perceived themselves as competent to evaluate and treat PWS. One participant (4%) felt that the observation of the stuttering intervention enabled her to consolidate the theory and develop a deeper understanding of the theory related to fluency disorders. It was interesting to note that only one participant's (4%) perceived competence was negatively influenced by the observation sessions; on the pre-intervention questionnaire she reported, "At the moment I still feel doubtful, but I do feel that there was enough information given to us so that we can, with time, give the correct evaluation and treatment to someone." On the post-intervention questionnaire she described conflicting confidence, reporting that she felt "completely incompetent after the observations". Using the McNemar Chi-square test for the related pre- and post-intervention measures related to the participants' perceived competence to manage PWS in general indicated that the percentage differences from these two administrations of the questionnaire was statistically significant (df=1; p=.009).

A 5-point scale (ranging from 1 = least competent to 5 = most competent) was used to determine how competent to treat PWS the students perceived themselves to be. Table 1 shows the mean and the standard deviation (SD) for how competent to treat PWS the participants rated themselves to be.

Table 1: Participants' ratings on how competent they perceive themselves to treat PWS

	n	Mean	SD
Pre-intervention	24	2.75	0.53
Post-intervention	24	3.21	0.59

The use of ANOVA for these related measures indicated that the scores from the two administrations of the questionnaire were significantly different (F(1,23)=8.3075, p=.008) as depicted in Figure 4.

Current effect: F(1, 23)=8.3075, p=.00841
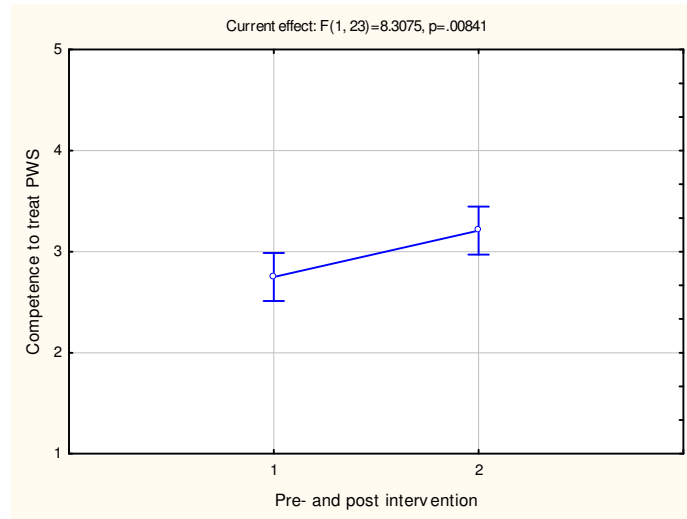
Figure 4: **Participants' pre- and post-intervention ratings on how competent they perceive themselves to treat PWS**

The next question explored which aspects of stuttering the participants did not feel competent about. Table 2 summarises the percentage of participants who reported feeling incompetent in certain aspects related to stuttering management.

Table 2: Summary of aspects of stuttering that the participants did <u>not</u> feel competent in before and after the observation sessions

			Evaluation methods	Treatment methods	Not applicable
Percentages	Pre-intervention	n = 24	38%	54%	8%
	Post-intervention	n = 24	50%	25%	25%
Chi-square			.27	3.27	.17
df			1	1	1
p-value			.61	.07	.68

Prior to the observation sessions, the participants felt least competent in the area of treatment methods for PWS, followed by evaluation methods. Following the observation sessions, although not statistically significant (df=1; p=.07), the only positive difference in the participants' perceived competence was related to their use of treatment methods. In the open-ended questions related to this question, counselling and management of the young PWS and their parents were reported by two participants (8%) as other aspects of stuttering intervention that they still feel incompetent in.

3.2 <u>Participants' perceived competence to manage varying age groups and types of stuttering</u>
The second area of the questionnaire pertained to participants' perceived competence regarding the stuttering intervention for specific age groups of PWS and types of stuttering.

Table 3 reports the mean and standard deviation (SD) related to the participants' perceived competence, on a 5 point-scale ranging from least competent (1) to most competent (5), to manage the varying age groups of PWS.

Table 3: Participants' perceived competence to manage varying age groups of PWS

Age group	n	Time	Mean	SD	p-value
Pre-school	24	Pre-intervention	3.29	0.86	.85
	24	Post-intervention	3.25	0.90	
School-age	24	Pre-intervention	3.13	0.68	.03
	24	Post-intervention	3.46	0.59	
Adolescents	24	Pre-intervention	2.71	0.62	.02
	24	Post-intervention	3.33	0.70	
Adults	24	Pre-intervention	2.25	0.90	.00
	24	Post-intervention	3.33	0.96	

According to the data in Table 3, participants' perceived competence to manage pre-school and school-age PWS was better than for managing adolescents and adults. These scores were not significantly different before and after the additional training component. Although initially feeling less competent to treat adolescents and adults, the participants did however show statistically significant improvement in their perceived competence to treat adolescents $(F(1,23)=12.23, p=.02)$ and adults $(F(1,23)=36.33, p=.00)$ after exposure to the additional training component.

Table 4 shows the mean and standard deviation (SD) related to the participants' perceived competence, on a 5 point-scale ranging from least competent (1) to most competent (5), to manage different types of PWS.

Table 4: Participants' perceived competence to manage different types of stuttering

Diagnosis	n	Time	Mean	SD	p-value
Borderline	24	Pre-intervention	3.46	0.72	.60
	24	Post-intervention	3.38	0.77	
Beginning	24	Pre-intervention	3.08	0.83	.23
	24	Post-intervention	3.29	0.69	
Intermediate	24	Pre-intervention	2.54	0.66	.00
	24	Post-intervention	3.21	0.83	
Advanced	24	Pre-intervention	2.00	0.72	.00
	24	Post-intervention	2.96	0.95	

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The results in Table 4 show that the participants agreed that they felt more competent to manage borderline and beginning stutterers after their theoretical module, and no significant differences were reflected in their perceived competence post-intervention. Further analysis revealed that the participants initially felt less competent to treat intermediate and advanced PWS, but there was significant improvement in their perceived competence to treat intermediate ($F(1,23)=11.500$, $p=.00$) and advanced stutterers ($F(1,23)=24.189$, $p=.00$) after the observation sessions. This correlates with their positive perceived competence post intervention to treat adolescents and adults respectively.

3.3 Participants' perceived competence to use specific technical skills during evaluation and treatment of PWS

The third area of the questionnaire focused on participants' perceived competence to use specific technical skills (i.e. using specific stuttering evaluation procedures and stuttering therapy techniques) during the intervention of PWS. A 4-point Likert-scale (ranging from 1 = strongly agree to 4 = strongly disagree) was used.

The data showed that sixteen participants (65%) did not feel competent to use specific technical skills prior to the additional training component. After observing the therapy sessions with the SP, seventeen participants (71%) reported feeling competent to use these technical skills. Using the McNemar Chi-square test for the related pre- and post-intervention measures revealed significant differences (df=1, p=.043) in the participants' perceived competence to use the specific technical skills in the management of PWS, as shown in Figure 5 (p..
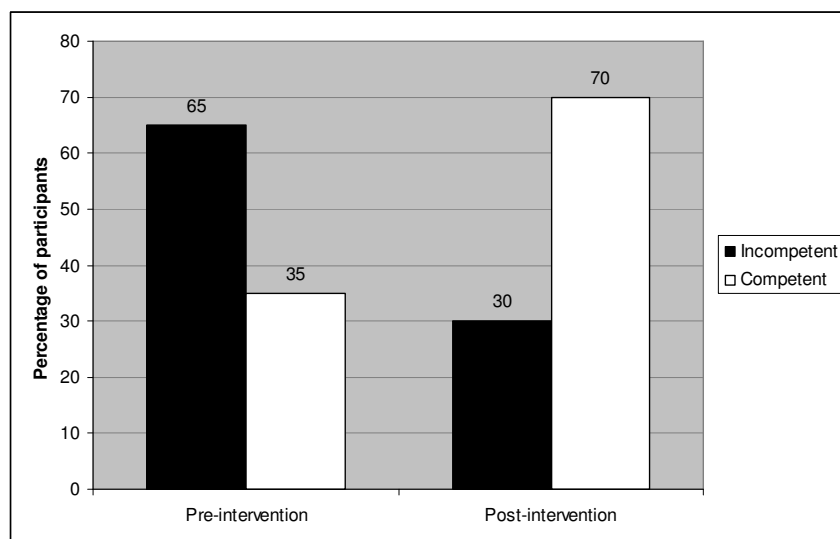

Figure 5: **Participants' perceived competence to use specific technical skills**

Likert-scale questions (ranging from 1 = strongly agree to 4 = strongly disagree) were used to examine whether the participants' perceived competence to evaluate PWS changed after the intervention. The data depicted in Figure 6 shows that the participants' perceived confidence to

evaluate PWS improved following the observation sessions, although the difference was not statistically significant $(F(1,23)=1.00, p=.33)$.
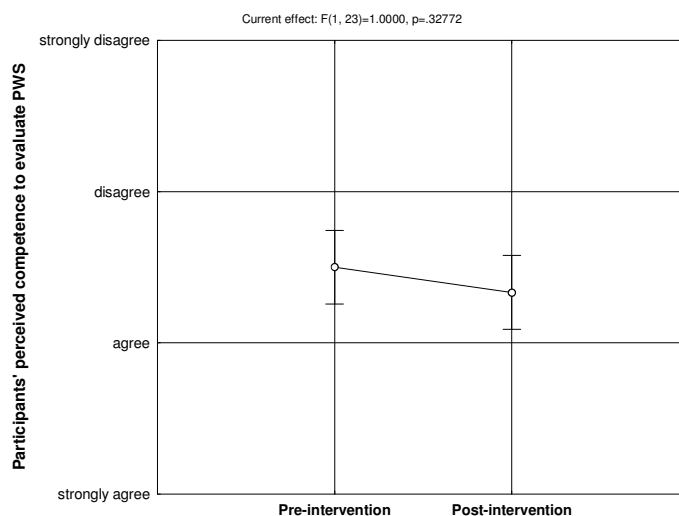

Figure 6: Participants' perceived competence to evaluate PWS

Examining the data revealed that only one participant (4%) strongly agreed that she felt competent to evaluate PWS, while ten participants (42%) agreed that they felt competent and thirteen participants (54%) disagreed. Following the additional training component, more participants (58%) agreed that they could evaluate PWS, while the participants who disagreed decreased to nine participants (38%).

Table 5 summarises participants' perceived competence in various aspects related to the evaluation of PWS.

Table 5: Participants' perceived competence related to different aspects of evaluation of PWS

Skill	n	Time	Mean	SD	p-value
Using the SSI-3	24	Pre-intervention	2.75	0.61	.00
	24	Post-intervention	2.29	0.62	
Identifying patterns of disfluency	24	Pre-intervention	1.88	0.54	.75
	24	Post-intervention	1.92	0.50	
Making a differential diagnosis	24	Pre-intervention	2.75	0.61	.01
	24	Post-intervention	2.38	0.49	

Only one participant (4%) strongly agreed that she felt competent to use the SSI-3 to evaluate PWS, while sixteen (67%) agreed that they had the ability to use this instrument. Six participants (25%) disagreed and felt that they could not use the SSI-3, while one participant (4%) strongly disagreed. According to the data, there was a significant improvement $(F(1,23)=14.57, p=.00)$ in the participants' perceived competence to use the SSI-3 during the evaluation of PWS subsequent to the additional training component.

13

On the pre-intervention questionnaire, five participants (21%) strongly agreed to being confident in their ability to identify patterns of disfluency, including core and secondary behaviour. Seventeen (71%) participants agreed with this statement. Only two participants (8%) disagreed and did not feel confident in their ability to identify core and secondary stuttering behaviour. There was no statistically significant difference ($F_{(1,23)}$=.107, p=.75) in the measures obtained from the post-intervention questionnaires and only one participant changed her response from "strongly agree" to "agree".

Preceding the observation sessions, more than half of the participants (58%) indicated that they disagree to having confidence in their ability to make a differential diagnosis after evaluating a PWS, while two participants (8%) strongly disagreed. Only eight participants (33%) felt that they agree and have the ability to make a differential diagnosis. The percentage of participants who agreed to greater perceived confidence following the observation sessions rose significantly ($F_{(1,23)}$=8.06, p=.009) to fifteen participants (63%).

There was a bimodal distribution in the participants' comfort levels (46% agreed, 50% disagreed) prior to the additional training component, to use stuttering therapy techniques during the treatment of PWS. Responses on the post-intervention questionnaire showed two participants (8%) strongly agreed and nineteen participants (79%) agreed that they felt comfortable to use stuttering therapy techniques after the observation sessions, while only three (13%) participants still disagreed on this statement. As seen in Figure 7, there was a statistically significant difference ($F_{(1,22)}$=12.45, p=.002) in the measures obtained on the post-intervention questionnaire.
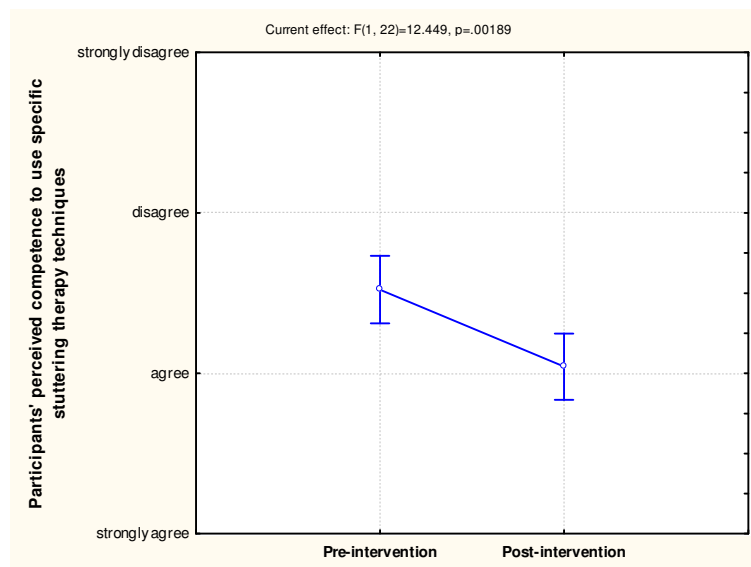

Figure 7: Participants' comfort levels to use stuttering intervention techniques during treatment of PWS

Table 6 summarises participants' perceived competence to use the various stuttering therapy techniques during the treatment of PWS.

Table 6: Participants' perceived competence to use different stuttering therapy techniques

Skill	n	Time	Mean	SD	p-value
Cancellations	24	Pre-intervention	2.58	0.72	.09
	23	Post-intervention	2.30	0.47	
Pull-outs	24	Pre-intervention	2.75	0.68	.01
	24	Post-intervention	2.33	0.48	
Flexible speech rate	24	Pre-intervention	1.88	0.54	.06
	24	Post-intervention	1.67	0.48	
Easy onsets	24	Pre-intervention	2.17	0.45	.03
	24	Post-intervention	1.67	0.48	
Light contacts	24	Pre-intervention	2.33	0.48	.00
	24	Post-intervention	1.75	0.53	
Proprioception	24	Pre-intervention	2.29	0.55	.66
	24	Post-intervention	2.25	0.61	
Voluntary stuttering	24	Pre-intervention	2.04	0.75	1.00
	24	Post-intervention	2.04	0.75	

With regard to the use of cancellations, only twenty-three participants (n = 23) answered the question on the post-intervention questionnaire. There was a bimodal distribution (42% agreed, 46% disagreed) of the pre-intervention data for the participants agreeing and disagreeing that they perceive themselves as competent to use cancellations. In contrast, sixteen participants (70%) (n = 23) felt competent to use cancellations subsequent to the observation sessions, while seven participants (30%) still reported feeling incompetent to use this technique. Comparison of these pre- and post-intervention measures show no statistically significant difference ($F(1,22)=3.14$, $p=.09$) in the participants' perceived competence to use cancellations as a therapy technique.

Analysis of the data showed that there were significant differences ($F(1,23)=6.93$, $p=.015$) among participants' responses related to the use of pull-outs. Preceding any exposure to the use of pull-outs, one participant (4%) strongly agreed and seven participants (29%) agreed that they felt competent to use pull-outs, whilst two-thirds of participants (67%) felt incompetent to use this therapy technique. In contrast, the post-intervention questionnaire showed that seventeen students (71%) perceived themselves as competent to use this therapy technique after they had observed it being applied to the SP.

The vast majority of the participants (92%) perceived themselves as competent to model a flexible speech rate to PWS before they observed this technique being used during treatment of a PWS. In the responses obtained on the post-intervention questionnaire, all the participants (100%) reported that they felt competent to use this therapy technique, resulting in a positive change, although there was not a statistically significant difference (F(1,23)=4.02, p=.057) between the two measurements.

The pre- and post-intervention measurements related to participants' competence to use easy onsets as therapy technique differed significantly (F1,23)=10.90, p=.03). According to the pre-intervention questionnaire two participants (8%) strongly agreed and sixteen participants (67%) agreed that they felt competent to use easy onsets as therapy technique, while six participants (25%) disagreed and felt incompetent to use this technique. Following the additional training component, all the participants (100%) reported feeling competent to use this therapy technique.

The participants' perceived competence to use light contacts also showed significant improvement (F(1,23)=23.98, p=.00) subsequent to the additional training component. The pre-intervention measurement revealed that sixteen participants (67%) perceived themselves as able to use light contacts, whereas eight (33 %) felt that they were incompetent to use this therapy technique. Following observation of how this therapy technique is used, the vast majority of participants (96%) thought they could competently use this technique.

Preceding the observation sessions, a large portion of the participants (67%) indicated that they felt competent to use proprioception as a therapy technique, while eight students (33%) disagreed with this statement. The data related to this question remained similar for both measurements and did not differ significantly (F(1,23)=.19, p=.66) on the two measures.

The last therapy technique on which the participants' perceived competence was measured, was their ability to demonstrate voluntary stuttering to PWS. The participants' perceived competence to use this therapy technique did not show any statistically significant change on the pre- and post-intervention questionnaires (F(1,23)=0.00, p=1.00).

In summary, the aspects on which the participants reported a positive change in their perceived competence following the observation sessions, are summarised in Table 7.

Table 7: Areas of perceived competence which improved post intervention

- Evaluation of PWS, including the use of the SSI-3;
- Making a differential diagnosis subsequent to evaluation;
- Treatment of PWS (in general);
- How competent students feel to manage PWS;
- Treating adolescent and adult PWS;
- Treating intermediate and advanced PWS;
- The ability to use specific technical skills, including: pull-outs, a flexible speech rate, easy onsets and light contacts.

The aspects of the participants' perceived competence related to the clinical management of PWS which did not improve significantly subsequent to the additional training component, are summarised in Table 8.

Table 8: Areas of perceived competence which did not improve significantly post-intervention

- Identifying patterns of disfluency, including core and secondary behaviour;
- Treating pre-school and school-age children;
- Treating borderline and beginning stutterers;
- Using cancellations and proprioception as stuttering therapy techniques;
- Demonstrating voluntary stuttering as a therapy technique.

3.4 <u>Participants' needs in terms of perceived competence to manage PWS</u>

The final section of the questionnaire addressed participants' needs in terms of what will make them feel more competent to treat PWS, as shown in Figure 8. This was an open-ended question and therefore participants could identify more than one need. Participants' answers were grouped into related themes.
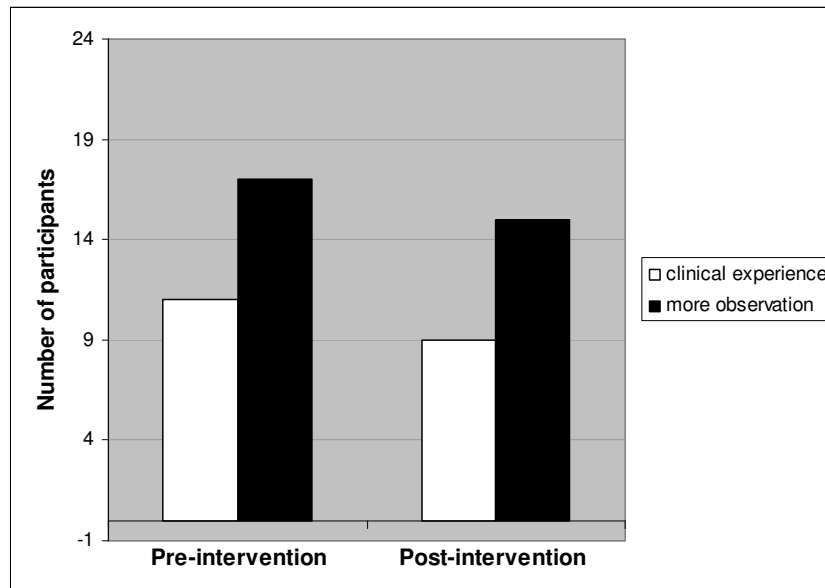
***Figure 8*: Participants' (n = 24) needs in terms of improving their perceived competence**

Directly after completion of the theoretical module, a significant number of participants (71%) indicated that the observation of therapy sessions by an experienced therapist would enhance their perceived competence to manage PWS. Personal clinical experience was the other factor which eleven of the participants (46%) felt could improve their ability to manage PWS.

Following the additional training component, two-thirds of the participants (63%) indicated that further observation of therapy sessions would make them feel more competent to manage PWS. One participant reported that it "will help to observe a variety of people who stutter", whilst others requested in addition "observation of stuttering therapy with different levels of patients" and "more observations with different types of stuttering". It was interesting to note though that three participants (13%) indicated that the observation of "real therapy" or "therapy with a real patient" will make them feel more competent. Post-intervention, fewer participants (42%) indicated that clinical experience would enhance their perceived competence to manage PWS.

The last question on the questionnaire allowed for 'any other comments'. Prior to the additional training component, two students commented on the format of the lectures and the theoretical content of the module. Their comments will not be described here, since it does not relate to the subject of this paper. Post intervention, half the students (50%) specifically commented on the value of the additional training component they had received, and how they believed it had improved their competence to manage PWS.

4. DISCUSSION

This study explores and describes changes in students' perceived competence to manage PWS after they have received an additional training component, where they observed the evaluation of a PWS and specific stuttering therapy techniques applied to this PWS, using an SP.

This study is one of the first to provide specific information concerning undergraduate SLT students' perceived competence to manage PWS and the use of an SP to influence this perceived competence. SPs have successfully been used in the training of doctors, dentists and nurses for some time and there is an array of literature reporting on this. Except for one study done in the United Kingdom (Syder, 1996), no evidence could be found where SPs have been used in the training of SLTs. Based on the results of the present study, the majority of SLT students did not feel competent to evaluate and treat PWS directly after completion of their theoretical module, nor did they feel competent to use specific evaluation procedures or stuttering therapy techniques taught in the theoretical module. Their exposure to the additional training component where they observed these procedures applied in intervention with an SP, resulted in significant higher levels of perceived competence, as summarised in Table 7 (see page 17).

Student SLTs learning to perform therapy frequently experience anticipated failure and may subsequently develop avoidance tendencies. It has been suggested that this is especially true of clinicians working with PWS (Rudolf, Manning & Sewell, 1983). Situations that are perceived as provoking fear and anxiety, such as the management of PWS, can create expectations of failure in students prior to actual performance (Rudolf et al., 1983). Therefore, it can be inferred that this expectation of failure can negatively influence students' perceived competence to manage PWS. According to outcome expectancy theories, by observing environmental consequences that occur following a particular response performed in the presence of a certain stimulus, students can come to expect that the consequences are consistent and attainable (Rudolf et al., 1983; Schunk, 2004). Therefore, the students' observation of successful intervention where a qualified SLT utilises specific evaluation procedures and stuttering therapy techniques, resulting in positive outcomes, could create certain expectations regarding the management of PWS in the students prior to their actual exposure to PWS, thereby improving their perceived competence.

Traditionally, learning through the use of SPs occur enactively through students' interaction with SPs. In this study, however, students did not learn through personal interaction with the SP. Learning occurred vicariously through observation of the SP in interaction with the qualified therapist as role model and the students learned without overt performance. Nevertheless, based on the data obtained, the SP methodology utilised in this study improved the third-year SLTs' perceived competence to evaluate and treat PWS. One reason for this could be that the observation sessions assisted the students to transfer their didactic knowledge to the clinical environment (Weller, 2004). This form of learning has its foundation in the social cognitive theory of learning (Schunk, 2004),

which highlights the idea that a great deal of human learning occurs in a social environment. Within this theory, "learning is largely an information processing activity in which information about the structure of behaviour and about environmental events is transformed into symbolic representations that serve as guides for action" (Bandura, 1986, p. 57).

According to Schunk (2004), when students believe that the modelled behaviours are useful, they attend carefully to the model and mentally rehearse these behaviours. Therefore, the SLT students could develop improved perceived competence to use diverse types of behaviours. Through observational learning, information was conveyed, by the model to the students, of ways to produce new behaviours, like the use of stuttering evaluation procedures and therapy techniques. Through this observation, the students formed conceptual representations of the specific techniques by transforming observed sequences of behaviours into visual and symbolic codes that could be cognitively rehearsed. This provided them with mental models of the specific stuttering evaluation and therapy techniques before they have to attempt performing it, improving their perceived competence.

Including SPs into the students' pre-clinical training furthermore utilised situational learning (Schunk, 2004; Yoo & Yoo, 2003). During the additional training component, the participants were provided with a setting similar to real clinical situations, which helped them to understand the process of structuring and restructuring knowledge in real world situations. Inclusion of a live human being in the simulation through the use of an SP, rather than using video material, increased the learning experiences' realism, emphasised the link with clinical reality and provided authentic and powerful learning experiences (Syder, 1996; Weller, 2004; Kneebone & Nestel, 2005). The authenticity of this SP androgogical approach was favoured by students when compared to the use of demonstrations or video material in the classroom.

By using the SP method, students did not only gain perceived clinical competence, but also had the opportunity to learn other cognitive skills, like problem solving, through observing the qualified SLT in action. During the feedback given to the students subsequent to every therapy session, the lecturer could reflect on the "teachable moments" which arose during that particular session and explain why certain actions were taken. Students learn most from observing actions and understanding the reasoning processes of the role model (Heidenreich, Lye, Simpson & Lourich, 2000).

Some of the results from the present study, however, differ from another study conducted by Brisk et al. (1997). According to their research, SLTs usually feel more competent to evaluate than to treat PWS. In contrast, the present study showed that the students perceived themselves less competent to evaluate than to treat PWS. This notion could be contributed to two factors. Firstly, less time was spent on evaluation of the PWS (one session), while more time was spent on treatment (three sessions) during the observation sessions. Secondly, this trend in the students' perceptions can be

attributed to the notion of 'response shift bias' (Skeff, Stratos & Bergen, 1992). The ratings which decreased, when an increase was expected, may have occurred because the students overrated themselves on the pre-intervention questionnaire. Subsequent to the intervention (when they had a better idea of what evaluation of a PWS entails), they rated themselves more accurately. Response shift bias could also explain the students' unchanged perceived competence in the use of cancellations, proprioception and voluntary stuttering. Post intervention, the students realised how complex these techniques are to apply and again, rated themselves more accurately than on the pre-intervention questionnaire.

The use of the SP teaching methodology improved the students' perceived competence to manage adult PWS, but they felt less competent to work with other age groups and levels of stuttering severity. The improvement in their perceived competence did not appear to transfer to other age groups and levels of stuttering. In a complex disorder such as stuttering, additional training using SPs, should therefore include a variety of SPs to reflect and address the variability of the disorder.

5. CONCLUSION

Due to a number of factors, students' clinical exposure to the management of PWS at undergraduate level, and subsequently their opportunity to develop the necessary clinical competence, is limited. Feelings of incompetence in managing PWS can negatively affect service delivery to this population, which is of great concern in a country with limited and unevenly distributed speech-language therapy services. This paper describes one way of increasing student SLTs' perceived competence to manage PWS, by using an SP.

Directly after the completion of the theoretical module and prior to clinical placement, the majority of SLT students at Stellenbosch University did not perceive themselves as competent to evaluate or treat PWS. A statistically significant change in the students' perceived competence, regarding the majority of aspects related to the management of older PWS, was reported subsequent to the additional training component. These findings highlight educators' responsibility to provide their students with alternative opportunities to develop clinical competence to manage PWS.

6. LIMITATIONS

The data for this study was obtained using a customised questionnaire based on existing questionnaires in the literature. The validity and reliability of this customised questionnaire was not established, which could have influenced the results obtained. Students from only one university were included in this study and therefore it is not possible to generalise the findings of this study to all SLT students in South Africa.

7. RECOMMENDATIONS

Students' observation of management of an SP portraying a PWS is not meant to replace one-to-one clinical learning with real patients, but is rather a different and additional process. It is an andragogical approach that should be implemented in the existing curriculum to 1) expose students to PWS before they are expected to evaluate and treat a PWS themselves, 2) help students progress from theory to practice, and 3) improve their perceived competence to manage PWS.

Future studies should employ a longitudinal approach to determine whether students' improved perceived competence subsequent to the intervention is maintained and realised in their approach towards PWS and the way that they manage this population. A comparison between students who received the additional training component and students who did not is also recommended. Future studies should aim to have a larger sample size.

There may be a number of ways in which the SP teaching methodology could further be used in the training of SLT students. The use of SPs in the training of other speech and/or language disorders should be considered.

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9. APPENDICES

Appendix A: Ethical approval from the Committee for Human Research at Stellenbosch University to

conduct study

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21 January 2010

Mrs C Vermeulen

Dep of Speech-Language and Hearing Therapy 4th Floor, Teaching building

Stellenbosch University

Tygerberg campus

7505

Dear Mrs Vermeulen

"Undergraduate Speech-Language Therapy Students' perceived competence to treat persons who stutter following an added training component using simulated patients."

ETHICS REFERENCE NO: N10/01/003

RE: DIRECT APPROVAL

It is a pleasure to inform you that a review panel of the Health Research Ethics Committee has approved the abovementioned project on 19 January 2010, including the ethical aspects involved, for a period of one year from this date.

This project is therefore now registered and you can proceed with the work. Please quote the above-mentioned project number in ALL future correspondence. You may start with the project, but this approval will however be submitted at the next meeting of the Health Research Ethics Committee for ratification. Notwithstanding this approval, the Committee can request that work on this project be halted temporarily in anticipation of more information that they might deem necessary to make their final decision.

Please note a template of the progress report is obtainable on www.sun.ac.zalrds and should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly and subjected to an external audit.

Federal Wide Assurance Number: 00001372

Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act NO.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as

Please note that for research at primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health (healthres@pgwc.gov.za Tel: +2721 4839907) and Dr Helene Visser at City Health (HeleneVisser@capetown.gov.za Tel: +2721 4003981). Research that will be conducted at any

tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

Yours faithfully

MR FRANKLIN WEBER

RESEARCH DEVELOPMENT AND SUPPORT

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QUESTIONNAIRE FOR SPEECH-LANGUAGE THERAPY STUDENTS

Thank you for completing this questionnaire. The purpose of the questionnaire is to explore and describe your perceived competence to evaluate and treat persons who stutter. It is important that you answer all the questions as honestly as possible. Your answers to this questionnaire will be treated confidentially.

CLINICAL MANAGEMENT OF STUTTERING

1.a) In your opinion, do you feel competent to evaluate and treat persons who stutter?

Yes	No
Please explain your answer.	

b) If no, in which of the following aspects of stuttering do you <u>not</u> feel competent? (Tick all the options that apply).

Knowledge of nature of stuttering	Knowledge of assessment methods
Knowledge of treatment methods	Other (please specify):
Not applicable	

2. Rate your competence to treat persons who stutter.

(1 = least knowledgeable; 5 = most knowledgeable).

1	2	3	4	5

3. Rate your current level of competence in working with the following age groups of clients who stutter: (1 = least competent; 5 = most competent)

Pre-school children	1	2	3	4	5
School-age children	1	2	3	4	5
Adolescents	1	2	3	4	5
Adults	1	2	3	4	5

4. Rate your current level of competence in working with the following types of clients who stutter: (1 = least competent; 5 = most competent)

Borderline stuttering	1	2	3	4	5
Beginning stuttering	1	2	3	4	5
Intermediate stuttering	1	2	3	4	5
Advanced stuttering	1	2	3	4	5

5. a) Overall, do you feel that you have adequate <u>technical skills</u> (i.e. using specific stuttering evaluation procedures and stuttering therapy techniques) for working with persons who stutter?

Yes	No

b) Please use the scale to respond to the following items:

1	I feel competent to evaluate persons who stutter.	Strongly agree	Agree	Disagree	Strongly disagree
2	I can use the *Stuttering Severity Instrument 3* (SSI-3) to evaluate persons who stutter.	Strongly agree	Agree	Disagree	Strongly disagree
3	I am confident in my ability to identify patterns of disfluency, including core and secondary behaviour.	Strongly agree	Agree	Disagree	Strongly disagree
4	I have confidence in my skills to make a differential diagnosis after evaluating a person who stutters.	Strongly agree	Agree	Disagree	Strongly disagree
5	I will feel comfortable to use stuttering intervention techniques during the treatment of stuttering.	Strongly agree	Agree	Disagree	Strongly disagree

6	I will feel competent to use cancellations as a therapy technique.	Strongly agree	Agree	Disagree	Strongly disagree
7	I will feel competent to use pull-outs as a therapy technique.	Strongly agree	Agree	Disagree	Strongly disagree
8	I will feel comfortable to model a flexible speech rate to persons who stutter.	Strongly agree	Agree	Disagree	Strongly disagree
9	I will feel competent to use easy onsets as a therapy technique.	Strongly agree	Agree	Disagree	Strongly disagree
10	I will feel competent to use light contacts as a therapy technique.	Strongly agree	Agree	Disagree	Strongly disagree
11	I will feel competent to use proprioception as a therapy technique.	Strongly agree	Agree	Disagree	Strongly disagree
12	I will be able to demonstrate voluntary stuttering as a therapy technique.	Strongly agree	Agree	Disagree	Strongly disagree

6. What will make you feel more competent to treat persons who stutter?

Please describe:

7. Any other comments.

_____

_____

_____

_____

Thank you for taking time to complete this questionnaire.