

Academic, Clinical, and Educational Experiences of Self-Identified Fluency Specialists

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Abstract

Purpose: *The purpose of the present study is to examine whether the academic, clinical, and fluency-related student experiences of professionals who self-identify as having specialized knowledge of fluency disorders differ from those who do not.*

Method: *An online survey was developed to identify the academic, clinical, and specific fluency-related experiences professionals had when they were undergraduate and graduate students. The survey was completed by 219 professionals within the field of speech-language pathology (122 self-identified specialists, 97 self-identified non-specialists).*

Results: *Considerable overlap was observed in training experiences of self-identified specialists and non-specialists. However, Chi-square analyses revealed a significantly greater proportion of self-identified specialists reported (a) completion of a dedicated course in fluency disorders during undergraduate and graduate curriculum, (b) interaction with five or more fluency clients during clinical practicum, and (c) exposure to specific fluency-related activities such as voluntary stuttering and attendance at a fluency-related support group.*

Conclusion: *Findings suggest that despite the degree of overlap between self-identified specialists' and non-specialists' pre-professional training, the quantity and quality of certain experiences may influence future decisions to focus more exclusively on working with persons who stutter.*

Introduction

Despite the increasing number of students entering speech-language pathology over the past decade (American Speech-Language-Hearing Association [ASHA], 2013), clients who stutter continue to report dissatisfaction with clinicians who provide treatment for fluency disorders (National Stuttering Association [NSA], 2009). Individuals who stutter consistently rate the competence of the clinician as a critical element to successful therapy (e.g., Plexico, Manning,

& DiLollo, 2010; Yaruss et al., 2002). Unfortunately, formal specialization in fluency disorders has declined in recent years (e.g., Gabel, 2014; McClure & Olsen, 2010), and the number of professionals who report having specialized or advanced knowledge in fluency disorders remains insufficient relative to the clinical population. A review of membership rosters from three prominent stuttering-based organizations¹ in 2013 indicate as low as 132 practitioners who hold formal specialization in fluency disorders [Board Certified Specialist in Fluency; BCS-F], and 1,115 professionals who actively seek clients with fluency disorders (i.e., SFA) or seek more information regarding fluency disorders (Special Interest Group 4 membership). Based on these combined numbers, less than 1% (i.e., 0.88%) of professionals in the United States. ($n=141,847$; ASHA, 2013) self-identify as willing service providers or specialists relative to the estimated 15 million children and 3 million adults who stutter (National Institute of Health, National Institute on Deafness and Other Communication Disorders [NIH], 2010). To address this under-served population, there is an urgent need to identify which factors may motivate specialization in fluency disorders.

The limited number of professionals with specialized knowledge in fluency disorders available to serve this clinical population is consistent with three decades of research that indicate that a majority of speech-language pathologists (SLPs) report discomfort when working with individuals who stutter (e.g., Brisk, Healey, & Hux, 1997; Cooper & Cooper 1985; Gabel, 2014; Kelly et al., 1997; St. Louis & Durrenberger 1993; cf. Crichton-Smith, Wright, & Stackhouse, 2003). Across these survey studies, many respondents also report insufficient academic or clinical preparation as a student. The quantity and quality of pre-professional training in fluency disorders remains an area of concern within the field (e.g., Lee, 2014; Yaruss, 1999; Yaruss & Quesal, 2002). A non-trivial number of these SLPs report no exposure to fluency coursework (e.g., 10%: Gabel, 2014; 19%: Kelly et al., 1997) or fluency clients (e.g., 13%: Gabel, 2014; 43%: Kelly et al., 1997) during graduate or undergraduate training. In response to limited access to fluency clients, experts within the field have recommended incorporating supplemental fluency-related experiences into the curriculum to enhance student knowledge of fluency disorders (e.g., reading or hearing stories from people who stutter, voluntary stuttering, participation in support group for fluency disorders; Manning, 2004; Murphy & Quesal, 2004). However, upon completion of a review of 65 syllabi of courses dedicated to fluency disorders, Bernstein Ratner (2001) found the frequency of these activities vary significantly across programs. These findings, combined with data across multiple survey studies, lead to the natural assumption that educational barriers and inconsistent training experience may account for the low number of practicing SLPs who report as having specialized knowledge in fluency disorders.

However, survey data, to date, have not differentiated the academic training experiences of professionals who report limited to no competency working with persons who stutter from those few respondents who express advanced competency. Past research indicates that a small number of SLPs rate themselves as *highly* knowledgeable in fluency disorders (5%: Kelly et al., 1997) and *most* successful when treating fluency clients (4%: Gabel, 2014). If limited educational exposure has detrimental effects on future self-identification as a specialist in fluency disorders, it is reasonable to predict that this small number of self-identified specialists would report increased or distinct educational experiences with fluency disorders from self-identified non-specialists. Previous survey studies have not distinguished the experiences of these respondents, and it remains unknown whether or not training experiences of professionals who self-report specialized knowledge in fluency disorders are dissimilar from those who express minimal knowledge in fluency disorders. Such information would be of value with regard to past and any potential future changes to academic and clinical requirements that might lead to an even smaller number of persons with specialized knowledge in fluency disorders. Thus, the purpose of the present study was to examine whether or not academic, clinical, and fluency-related

¹ASHA Special Interest Group 4, Fluency and Fluency Disorders [SIG 4], Stuttering Foundation of America [SFA], and Specialty Board on Fluency Disorders [SBFD], currently known as the American Board of Fluency and Fluency Disorders

experiences of professionals who self-identify as specialists in the area of fluency disorders differ from professionals who report limited knowledge in fluency disorders.

Academic Exposure

One explanation of decreased competence in fluency disorders beyond graduation is limited or no access to academic coursework. Yaruss and Quesal (2002) reported that of 159 accredited graduate programs across the United States, 23% allowed students to graduate without any formal course in stuttering. Yaruss and Quesal suggested that changes in ASHA's requirements in 1997 and 2005 in the allowable coursework may have compromised student knowledge or interest in fluency disorders. Survey data of practicing SLPs spanning this time frame also indicate an increased percentage of respondents who report insufficient skills in fluency disorders (Kelly et al., 1997, 48%, $n = 151$; Gabel, 2014: 71%, $n = 141$). Interestingly, most respondents across these studies reported completion of at least one dedicated course in fluency disorders at the graduate level (65% and 79%, respectively). These data suggest graduate coursework may have limited association with a student's future self-perception of competency in fluency disorders. However, no distinction between previous academic exposure for current professionals with and without competence in fluency disorders was provided. For this reason, these data along with results from other similar studies (e.g., St. Louis & Lass, 1981; Tellis, Bressler, & Emrick, 2008) must be interpreted with caution, as the relationship between academic training and professional expertise in fluency disorders remains unclear.

Recent survey data from Lee (2014) indicate that the consequences of ASHA's policy changes noted by Yaruss and Quesal (2002) may have compromised undergraduate curriculum more so than graduate curriculum. In 2014, only 4% of graduate programs (of 140 accredited programs) allowed Master's students to graduate without academic exposure to fluency disorders, but 97% of *undergraduate* programs (of 115 accredited programs) allowed students to graduate with no exposure to fluency disorders. Comparison of reported academic exposure by Kelly et al. (1997) and Gabel (2014) also corroborate this downward trend in academic exposure during undergraduate training. The percentage of undergraduates majoring in speech-language pathology who reported no dedicated coursework in fluency disorders increased between 1997 (19%) and 2014 (48%). In addition, respondents across the Kelly et al. and the Gabel studies reported a majority of fluency coursework was taken as part of another course at the undergraduate level (64% to 65%). Again, these studies did not differentiate the undergraduate experiences of respondents who did and did not report professional aptitude in fluency disorders. Therefore, the contribution of undergraduate training to professional expertise cannot be derived from these data. Nonetheless, available data suggest that students may enter graduate programs with minimal or no exposure to fluency disorders.

To date, survey studies have not considered the combined effect of undergraduate and graduate level experiences of individual respondents. It is possible that no exposure to fluency disorders at the undergraduate level, or perhaps perfunctory exposure within a partial course, may provide minimal to no academic or clinical benefit prior to graduate level coursework. The number of accredited programs offering graduate level coursework as part of another class has systematically increased (Yaruss, 1999: 15%, Yaruss & Quesal, 2002: 36%, Lee, 2014: 44%), as well as the number of SLPs who reported taking fluency disorders as part of another course (Kelly et al., 1997: 39%, Gabel, 2014: 53%). These trends warrant further examination of the relationship between cursory exposure at the undergraduate or graduate level with self-report as specialists in fluency disorders post-graduation.

Clinical Exposure

Access to clinical education for students in speech-language pathology programs may have also been altered due to changes in ASHA's requirements over the past decade, but the trajectory is dissimilar to academic experiences. Of the 149 accredited programs reviewed in Yaruss and Quesal (2002), 65% of the programs allowed Master's students to graduate with zero clinical hours with fluency clients. However, Lee (2014) indicated an increase in the number of programs requiring

contact with fluency clients and fewer programs permitting students to graduate without obtaining any clinical hours (34% of 148 programs). Review of Kelly et al. (1997) and Gabel (2014) data also indicates a decrease in the number of graduate students receiving no clinical hours with fluency clients (52% to 13%). Despite this positive trend, the significance of clinical exposure to fluency clients with regard to future self-report as a fluency specialist is difficult to determine given the considerable percentage of SLPs in these studies who report lack of competence in stuttering (Kelly et al., 1997, Table 7: 48% ranked competence below "neutral") or lack of success when treating fluency disorders (Gabel, 2014, Table 4: 28% ranked treatment success below "neutral"). Respondents across these studies also report the least amount of competence when treating adults who stutter (Kelly et al., 1997, p. 201; Gabel, 2014, p. 11) compared to children who stutter. Closer examination of additional factors that may lead to future self-report as fluency specialist is worthwhile to investigate as those factors could be emphasized across academic and/or clinical curriculums to facilitate an increase in the number of clinicians who feel competent to serve this population.

Kelly et al. (1997) differentiated the amount of exposure students receive with younger versus older fluency clients. Of the 157 respondents, 63% to 59% received no clinical hours with preschool and school-age clients (respectively), and 59% received no exposure to adult fluency clients at the graduate level. Respondents who did receive clinical exposure reported a median of 10 to 20 clinical hours for all three age groups. However, an overall range of 1 to 100 clinical hours was also reported, suggesting that at least a small number of SLPs received considerable clinical interaction with fluency clients (i.e., 100 hours). Although these correlations were not reported, it is possible that the respondents who received substantial clinical contact also reported greater clinical competence, while the majority of respondents who received fewer clinical hours (as indicated by the positive skew in distribution) reported less confidence with fluency disorders. It is also possible that greater exposure to one age group as a student may affect the likelihood of perceived competence in fluency disorders as a professional. To account for the potential role of client age, examination of clinical exposure in the present study will be further subdivided by age of fluency clients.

Fluency-Related Experiences

Professional aptitude in fluency disorders may also be related, at least in part, to the specific fluency-related activities experienced as a student. Murphy and Quesal (2004) outlined several activities for educators and clinical supervisors that may promote a deeper understanding of clients with fluency disorders. For example, authors suggest reading stories written by people who stutter, hearing presentations by individuals who stutter, and observing people who stutter talking about their personal experiences may enhance training within academic programs. Bernstein Ratner (2001) reported fewer than 50% of 65 undergraduate and graduate syllabi mentioned classroom observations (i.e., presentations) or indirect observations (i.e., video-taped) activities at undergraduate or graduate coursework. Collective or virtual exposure to individuals who stutter as a student may provide valuable insight; however, the effect of such experiences on students' attitudes towards stuttering have yet to be determined. Langevin and Prasad (2012) found non-stuttering adolescents who completed an anti-bullying program that included an educational video narrated by a child who stutters reported more positive perceptions of peers who stutter. However, Flynn and St. Louis (2011) found high-schoolers' perception improved more so after hearing a live presentation from a person who stutters than from a professional video of individuals who stutter. Perceptions of stuttering may become more intractable with age, even for students in communication disorders graduate programs. Snyder (2001) reported minimal change in graduate clinicians' negative stereotypes immediately after watching video testimonials of persons who stutter discussing the emotional impact of fluency disorders. Similarly, physiological and subjective arousal of graduate clinicians becomes elevated after viewing taped segments of individuals who stutter (e.g., Crawcour 2010; Guntupalli, Nanjundeswaran, Dayalu, & Kalinowski, 2012). Thus, brief and passive exposure as a student may share a modest association with perceived competence in fluency disorders as a professional, and further examination is necessary

to determine the relationship between these experiences and self-report of specialization beyond graduation.

Less traditional student experiences with fluency disorders may provide more unique and durable knowledge of individuals who stutter due to the nature and duration of these interactions. For example, Yaruss, Quesal, and Reeves (2007) suggest that self-help groups provide a meaningful counterpart to traditional therapy. Recent data support the value of participation in support groups for fluency clients (e.g., Boyle, 2013; Trichon & Tetnowski, 2011) and coincide with data that suggest ongoing, personal contact with an adult who stutters decreases negative stereotypes that may dissuade interaction with this clinical population (e.g., Klassen, 2001; Schlagheck, Gabel, & Hughes, 2009). However, Bernstein Ratner (2001) reported fewer than 20% of syllabi included topics regarding self-help groups. Although a recent survey of National Stuttering Association membership reported a considerable number of practicing SLPs as respondents (28.7% of 1,235; NSA, 2009), the relationship between *early* support group experiences and future professional knowledge in fluency disorders remains speculative.

Finally, Murphy and Quesal (2004) endorsed simulation of stuttering, or *voluntarily stuttering* in public domains as a beneficial activity for students within academic programs. Bernstein Ratner's (2001) review found approximately 50% of dedicated courses explicitly included voluntary stuttering activities. Recent self-reports by non-stuttering graduate students in communication disorders programs indicate the act of voluntary stuttering facilitated a greater empathy towards those who stutter (e.g., Ham, 1990; Lohman, 2008; Rami, Kalinowski, Stuart, & Rastatter, 2003). However, previous studies suggest that simulation of disorders such as stuttering, and the related emotional valence, do not always have the desired effect, and may instead strengthen students' previously held negative stereotypes of those who stutter (e.g., Leahy, 1994, Gay, 2000; cf. Hughes, 2010). Thus, the effect voluntary stuttering as a student on self-reported specialization in fluency disorders as a professional also warrants investigation.

In sum, the number of certified specialists and non-certified professionals willing to self-identify as having specialized knowledge in fluency disorders remains low relative to the clinical population. Several studies have highlighted academic and clinical limitations that may account for the overall lack of comfort and decreased self-report of competency in fluency disorders. Evidence is also available to support the potential positive outcome of specific fluency-related experiences as a student. No study has compared whether or not these experiences may differ between professionals who do and do not self-report as having professional expertise in fluency disorders. Such comparisons can guide past as well as future revision to academic and clinical requirements in this area. The purpose of the present study is to investigate the association between academic and clinical experiences, as well as specific fluency-related activities experienced as a student, to self-identification as a specialist in fluency disorders. Specifically, we asked the following research questions:

1. Does academic exposure as a student differ between respondents who do and do not self-report as specialists in fluency disorders?
2. Does clinical exposure as a student differ between respondents who do and do not report self-report as specialists in fluency disorders?
3. Does completion of specific fluency-related activities as a student differ between respondents who do and do not self-report as specialists in fluency disorders?

Method

Terminology and Group Classification

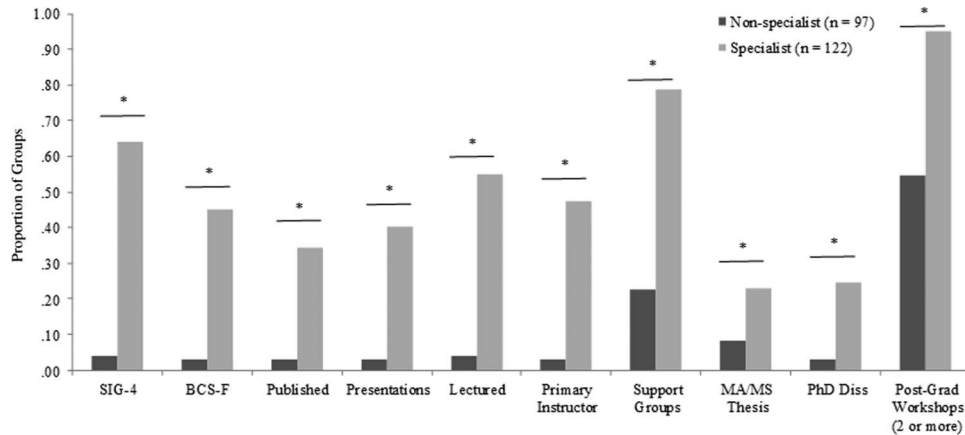
Previous literature has used diverse criteria to determine who is and is not a fluency specialist. For example, in their assessment of SLP attitudes towards stuttering, Crichton-Smith

et al. (2003) targeted three groups of SLPs: (a) those with and without stuttering clients on their caseload, (b) those without Lidcombe training but who reported a professional interest in stuttering and subscribe to Special Interest Group for Dysfluency, and (c) those with Lidcombe training. Related criteria have been applied to faculty members within academic programs to assess the relative emphasis on fluency disorders. Yaruss and Quesal (2002) collected data from accredited academic programs regarding, among many factors, whether or not the faculty members were members of ASHA's Special Interest Group (SIG) 4 or hold specialty recognition. Manning (2004) suggested that appraisal of effective academic programs should include whether clinical instructors (a) are active participants in the field of fluency disorders; (b) obtained ASHA's Certificate of Clinical Competence; (c) subscribe to SIG 4, Fluency and Fluency Disorders; (d) authored work has contributed to the knowledge in the field; and/or (e) have Board Certified Specialization in Fluency Disorders (BCS-F).

For the present study, we did not preemptively limit participation to professionals who met these criteria. Removal of these participants may unfairly exclude viable professionals. For example, there has been a significant decrease in the number of professionals who hold BCS-F certification (e.g., Gabel, 2014; McClure & Olsen, 2010). Additionally, the requirements for receipt of BCS-F certification at the time of survey distribution (i.e., 2013) precluded the inclusion of professionals in the field of fluency disorders who supervise rather than provide clinical services (<http://www.stutteringspecialists.org>). We also did not presume any single professional experience as the hallmark of specialization in fluency disorders. For instance, SIG 4 membership alone does not necessarily indicate having advanced knowledge of fluency disorders. Instead, we first asked each respondent to provide detailed information regarding each of his or her academic, clinical, professional, and personal experiences with fluency disorders. Specifically, respondents described themselves with regard to the following 10 criteria: (1) SIG 4 membership, (2) BCS-F certification, (3) authored published works related to fluency disorders, (4) presented peer-reviewed material at national conventions regarding fluency disorders, (5) provided lectures in a post-graduate setting related to fluency disorders, (6) served as primary instructor of a course dedicated to fluency disorders, (7) attended or participated in stuttering support groups (e.g., National Stuttering Association, Friends), (8) completed a Master's thesis on a topic related to fluency disorders, (9) completed a PhD dissertation related to fluency disorders, and (10) attended continuing education workshops on fluency disorders post-graduation. Respondents were then allowed to self-identify as "a specialist or having specialized knowledge in fluency disorders." This detailed information about professional experiences related to fluency disorders was collected to examine the similarity of experiences between groups.

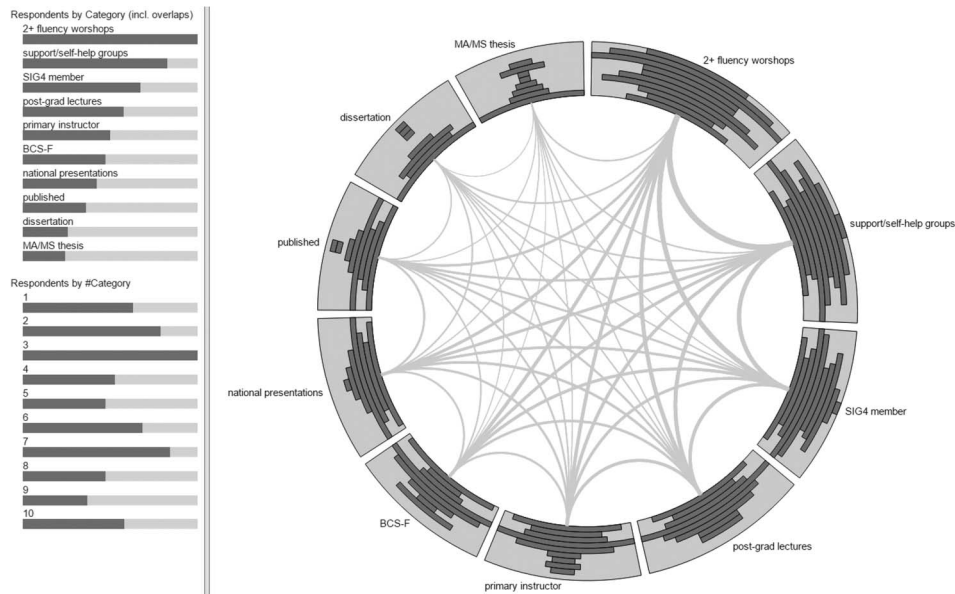
Description of professional experiences for each group provided in Figure 1 and Figure 2 illustrate that this broader definition was valid and that many respondents who self-identified as specialists had similar professional experiences, often without holding formal specialization. Based on these data, the two groups were considered distinct (self-reported *specialists* and self-reported *non-specialists*) and compared during analyses. That is, for the purposes of the present study, the terms *specialists* and *non-specialists* refer to respondents who did and did not self-identify as having specialized knowledge of fluency disorders, rather than exclusively focusing on those participants who had received BCS-F.

Figure 1. Description of Respondents' Professional Experiences Specific to Fluency Disorders.



* indicates $\chi^2 < .05$ and adjusted residuals > 2.0 (Agresti, 2013, p. 81). SIG-4: Membership in Special Interest Group Division 4, Fluency and Fluency Disorders; BCS-F: Board Certified Specialist in Fluency Disorders; PhD Diss: dissertation related to fluency disorders completed during PhD program.

Figure 2. Professional Credentials of Specialists (n=122).



Segments represent each of the 10 professional achievements, outermost bars represent number of respondents satisfying a single factor; innermost bars represent number of respondents satisfying all 10 factors; arcs represent degree of co-occurrence per respondent between each factor. Interactive graph available at http://disfluencies.com/radial_set1/RSWeb/demo.html.

Respondents

Respondents were targeted as potential specialists based affiliation with three nationwide fluency-related sources: (a) ASHA SIG 4, Fluency and Fluency Disorders roster (<http://www.asha.org/sig/04>); (b) the SFA Resource and Referral list (www.stutteringhelp.org/Default.aspx?

[tabid=206](#)); and (c) Board Certified Fluency Specialists website (www.stutteringspecialists.org/membership.asp). Specialists included during distribution were limited to who provided an email address ($n=472$). Non-specialists were selected via ASHA's "Locate a Provider" directory located at www.asha.org/findpro/ and were limited to members who (a) provided an email address, and (b) were not affiliated with the three fluency-related organizations. Potential participants were adult men and women employed in a variety of occupational settings (e.g., universities, clinics, hospitals). To achieve comparable number of non-specialists, a randomized selection of 20% within each state were contacted ($n=550$).

Survey Development and Pilot Testing

A pilot survey was completed to assess the validity of responses, identify unclear questions, and evaluate response rate between groups. Email invitations were sent to all participants via www.surveymonkey.com with a link to the complete the survey. The email, as well as the first page of the survey, described the purpose of the study, confidentiality of responses, contact information, and approval from the authors' Institutional Review Board (IRB) with the instruction that respondents were free to terminate survey participation at any time during or after survey completion. Recipients were also provided a link to opt out of the study and future emails. The pilot survey included the following sections, as ordered: (1) five questions concerning demographic and professional information (i.e., highest degree attained, years of graduation, professional setting, professional duties, and self-identification as having "specialized or advanced knowledge in fluency disorders"), (2) 11 multiple choice questions regarding potential motivating factors for specialization suggested by previous research, (3) one multiple-choice question regarding the nature of undergraduate and graduate level exposure to fluency disorders, (4) one multiple choice question regarding the clinical experiences at the graduate and undergraduate experiences, (5) one open-ended question asking participants to describe specific factors which motivated interest in fluency disorders, and (6) one question requesting whether or not the respondent would like to volunteer to be contacted for a follow-up interview. Pilot survey data were collected between December 2012 and May 2013, which included initial contact and a 1-month reminder email to complete the survey.

Revisions to Final Survey and Distribution

During analysis of pilot data, four potential confounds were identified. First, response bias was evident by the greater number of surveys completed and returned by targeted specialists as compared to non-specialists. Second, threats to construct validity were identified, as a few targeted recipients from SIG 4, SFA, and BCS-F self-reported as non-specialists, and a few recipients not affiliated with SIG 4, SFA, or BCS-F self-reported as specialists. Third, potential item response variation was present due to inadequate distinction between type of academic coursework (i.e., elective vs. required partial course, elected vs. required dedicated course) and influence of experience (i.e., "Had this experience but it had no influence on career choice" vs. "None"). Fourth, overrepresentation of respondents within geographic regions, and perhaps student experiences within each region, was observed based on disproportionate response rates across states.

Development and Distribution of Final Survey

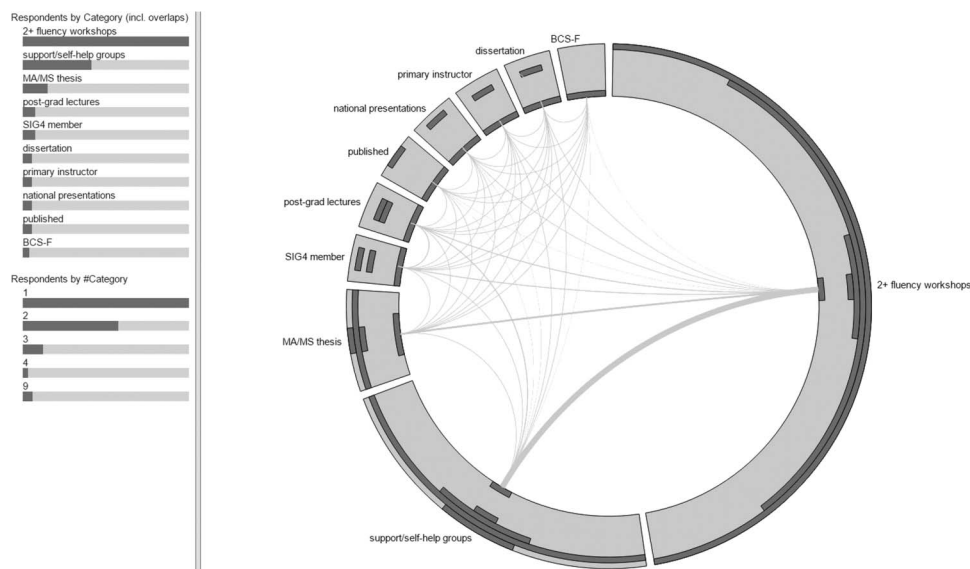
Results from the pilot survey were used to revise the content and distribution of the final survey from which data for the present study were analyzed. The revised and final version of the survey is available in Appendix A.

To address the issues of response bias and geographic overrepresentation during our final survey distribution, the sampling frame for the non-specialist cohort was calculated using a stratified random sampling of each group per state. Specifically, we tripled the initial sampling frame of potential non-specialists during final distribution *per state* ($20\% \times 3 = 60\%$). Randomized sampling of 60% of non-specialists per state resulted in 4,443 targeted non-specialist recipients. To decrease item response variation, key questions were revised to reduce ambiguity. Questions that were unclear on the pilot survey regarding nature of academic coursework (Items 9 and 13),

student experiences (Items 22, 23, 24, 25, and 27), as well as questions further examining the respondents recollection of fluency disorders course as a student (Items 10 and 14) were modified prior to distribution of the final survey to increase the validity of responses.

Finally, to address construct validity concerns, detailed information about professional experiences related to fluency disorders were included to examine the professional experiences for all respondents regardless of affiliation with fluency related organizations (Item 19), and *before* self-identification as being a specialist (Item 20). Specifically, respondents were described with regard to the 10 factors previously outlined in Group Classification. These data were collected to determine whether or not the professional experiences of respondents who self-identified as specialists were distinct from respondents who self-identified as non-specialists (see Figure 1, Figure 2, and Figure 3). Respondents were asked to further describe themselves by two additional factors: knowing a person who stutters as a student (Item 23), and self-identification as a person who currently or has ever stuttered (Item 26). Demographic information included current professional setting and duties (Items 1 and 2), geographic state of employment (Item 3), highest degree (Item 4), and years since graduation (Items 7 and 8).

Figure 3. Professional Credentials of Non-Specialists (n=97).



Segments represent each of the 10 professional achievements, outermost bars represent number of respondents satisfying a single factor; innermost bars represent number of respondents satisfying all 10 factors; arcs represent degree of co-occurrence per respondent between each factor. Interactive graph available at http://disfluencies.com/radial_set2/RSWebNon/demo.html.

To assess academic experiences, participants selected one of the following responses to describe the type of coursework received at the graduate and undergraduate levels (Items 9 and 13): (a) no exposure, (b) part of a required course which included topics other than fluency disorders, (c) part of an elective course which included topics other than fluency disorders, (d) elective course dedicated to fluency disorders, or (e) required course dedicated to fluency disorders. To assess clinical experiences, participants were prompted to estimate, to the best of their ability, the number of adults and child fluency clients seen as a student during clinical practicum by selecting one of the following responses: (a) None, (b) 1–2, (c) 3–4, (d) 4–5, or (e) more than 5 (Item 17).

Specific fluency-related experiences were assessed using responses from Items 23 and 24. All respondents indicated whether or not they had the following experiences as a student: (a) read a personal story by a person who stutters, (b) heard a presentation from a person who stutters, (c) completed a voluntary stuttering activity, and (d) attended a support or self-help group focused on fluency disorders (e.g., National Stuttering Association, Friends).

Mode of administration, information about financial incentives, participant consent, and IRB approval were identical to the distribution of pilot survey. The revised 28-item survey was administered between September 2013 and October 2013, followed by a second follow-up reminder email to complete the survey 1 month later.

Response Rate

A total of 4,915 professionals were contacted during final distribution. Of the 4,915 recipients, 4,554 did not respond (92.66%), 21 opted-out (0.43%), 49 bounced back due to email settings (1.00%), and 72 respondents (1.46%) did not complete the entire questionnaire. This resulted in 219 respondents who completed the entire survey (4.46% of the initial sample). Of these 219 respondents, 122 (55.71%) self-identified as specialists, and 97 (44.29%) self-identified as non-specialists. These numbers are comparable to surveys of general SLPs reported in Kelly et al. (1997) and Gabel (2014), with a greater number of those who expressed specialized knowledge in fluency disorders than previous studies. Demographic, descriptive, and experiential factors reported in all 219 completed surveys were coded by the first author. Binary responses (e.g., yes/no) were coded using 0 and 1, and non-binary or Likert-scale responses (e.g., age, years since graduation) were coded using their corresponding integers. All responses were then recoded by a trained undergraduate student with sufficient reliability (99.6% agreement, Intra-class correlation=.99).

Detailed description of professional experiences for respondents who did and did not self-report as fluency specialists was warranted to determine the degree of overlap within and between groups of respondents who self-identified as either a specialist or a non-specialist. Figure 1 depicts the proportion of specialists and non-specialists who met each individual criteria. Independent Chi-square analyses revealed that a significantly greater proportion of specialists than non-specialists had completed or satisfied each of the 10 descriptive categories. To further visualize the degree of overlap of professional experiences between respondents who self-identified as specialists or non-specialists, two independent Radial Sets (e.g., Alsallakh, Aigner, Miksch, & Hauser, 2013) in Figure 2 and Figure 3 depict the response rate for each category for all respondents who self-identified as specialists or non-specialists. Detailed descriptive data with each Radial Set can be retrieved at http://disfluencies.com/radial_set1/RWeb/demo.html for self-identified specialists and at http://disfluencies.com/radial_set2/RWebNon/demo.html for non-specialists. Briefly, the width of the outermost bars within each category represent the number of respondents who satisfied only that category (n). Each bar moving towards the center represents the number of respondents within that category who also satisfied additional criteria ($n+1$, $n+2$...) with the innermost bar representing the number of respondents who satisfied all 10 categories ($n+9$). Density of arcs between criteria represent the degree of overlap between individual categories based on participant responses.

The majority (89.3%, 109 of 122) of the self-identified specialists satisfied two or more of the 10 criteria. As depicted in Figure 2 and Figure 3, respondents within the self-identified specialist group largely occupy the innermost position, indicating that many of the respondents satisfied multiple criteria. In contrast, the majority (73.2%, 71 of 97) of the respondents in the self-identified non-specialist group occupied the outermost position and satisfied fewer than two criteria. Non-specialist respondents who satisfied two or more categories most commonly reported attendance at fluency workshops and support groups. Visual inspection of data in Figure 2 and Figure 3 provide greater confidence the self-identification of specialization resulted in two distinct groups prior to analyses (i.e., 'specialists' and 'non-specialists').

Finally, Table 1 illustrates demographic information between groups via Chi-Square analyses for categorical variables (i.e., highest degree acquired, current professional duties, self-identification as a person who stutters) and independent *t*-tests for continuous variables (i.e., response rate per state, years since graduation).

Table 1. Demographic information for specialist and non-specialist respondents.

	Non-Specialists (n = 97)	Specialists (n= 122)	sig (x ² or t)
MA/MS (n = 175)	41.6% (n = 91)	38.4% (n = 84)	*
Mean years since graduation	18.98 (SE = 1.18)	27.70 (SE = 1.02)	*
Doctorate (n = 44)	2.7% (n = 6)	17.4% (n = 38)	*
Mean years since graduation	17.33 (SE = 4.18)	17.97 (SE = 1.69)	ns
Non-PWS (n = 198)	42.9% (n = 94)	47.5% (n = 104)	*
PWS (n = 21)	1.3% (n = 3)	8.2% (n = 18)	*
Clinical (n = 189)	39.3% (n = 86)	47.0% (n = 103)	ns
Teaching (n = 76)	8.2% (n = 18)	26.5% (n = 58)	*
Supervisory (n = 112)	16.9% (n = 37)	34.2% (n = 75)	*
Research (n = 29)	1.4% (n = 3)	11.9% (n = 26)	*
Administrative (n = 47)	5.5% (n = 12)	16.0% (n = 35)	*
Number of states employed	38 of 50	39 of 50	ns
Response rate across states	0% to 7.7%	0% to 7.1%	

Note. Percentage values reflect proportion of entire sample (n = 219). PWS = person who stutters; SE = standard error of the mean; * indicates p-values < 0.05 (t-test) or adjusted residuals ≥ 2.0 (and x² < .05; Agresti, 2013); ns = non-significant difference.

Results

Academic, Clinical, and Fluency-Related Experiences

The purpose of this study was to examine the academic, clinical, and fluency-related experiences as a student reported by current specialists and non-specialists in fluency disorders. To do so, independent Chi-square analyses were conducted to determine significant differences between groups. Effect sizes were indicated using phi coefficients (ϕ) 2x2 analyses, and Cramer's V (ϕ_c) for tables 2x3 or larger. Phi coefficients values of .10, .30, and .50 indicate small, medium, and large effect, respectfully (Cohen, 1988). For 2x3 and 2x4 analyses, Cramer's V values of .06 to .07 indicate small effect, .17 to .21 indicate medium effect, and .29 or higher indicate large effect (e.g., Gravetter & Wallnau, 2004).

In addition to overall Chi-Square tests of independence, adjusted residuals were also examined to determine the nature of association between groups. Adjusted residuals that meet or exceed +/- 2.0 (+/-1.96 by convention) imply that associations between two variables are significant and did not occur by chance (Agresti, 2013). In the absence of significant overall Chi-square, adjusted residuals were not considered during analyses to avoid Type I error.

Academic experiences. Three independent Chi-square analyses were conducted to assess the association between fluency coursework and self-report as a specialist in fluency disorders during undergraduate, graduate, and combined experiences. The number of participants taking elective courses represented a small portion of the data (undergraduate level, n=6 [1.4%]; graduate level, n=14 [6.4%]). Elective and required coursework were therefore collapsed into three overarching categories: dedicated coursework, partial coursework, or no exposure.

Amount of fluency coursework (“No Exposure,” “Part of Another Course,” and “Dedicated Course”) and group classification (i.e., “specialists” and “non-specialists”) served as categorical variables across each analysis (Item 9 and Item 13). As depicted in Table 2, a 2x3 Chi-square test for independence found no significant association between amount of undergraduate fluency coursework and group, $\chi^2(1, n=219)=.620, p=.431, \phi_c=.16$. In order to maintain the assumptions of the Chi-square analysis during examination of graduate level coursework, cells without the minimum expected count were excluded ($n=4$, or 2.0% of total respondents [1 specialist, 3 non-specialists]), which included respondents reporting “No Exposure” to fluency coursework at the graduate level. Based on the resulting 215 viable responses, a 2x2 Chi-square analysis indicated a significant association between self-reported specialization in fluency disorders and graduate level coursework, $\chi^2(1, n=215)=4.04, p=.044, \phi=.14$, also depicted in Table 2. A significantly greater proportion of respondents who completed a dedicated course in fluency disorders during graduate programs self-identified as specialists (89.9%) as compared to those who did not (80.2%; adjusted residual=2.0).

Table 2. Undergraduate and graduate level coursework completed by fluency specialists and non-specialists.

Undergraduate coursework							
	No exposure	Partial course	Dedicated course	Total	p	ϕ_c	
Specialists	31 (29.5) ¹ [.5] ²	28 (35.7) [-2.3]	63 (56.8) [1.7]	122	.431	.16	
Non-Specialists	22 (23.5) [-.5]	36 (28.3) [2.3]	39 (45.2) [-1.7]				97
Total	53	64	102				
Graduate coursework							
Group	No exposure	Partial course	Dedicated course	Total	p	ϕ	
Specialists	3	12 (17.2) [-2.0]	107 (101.8) [2.0]	119	.044	.14	
Non-Specialists	1	19 (13.8) [2.0]	77 (82.2) [-2.0]	96			
Total		31	184	215			

Note. Effect size calculated using phi coefficient (ϕ) or Cramer’s V (ϕ_c). Significance indicated by p-values based on linear-by-linear association. Italicized values indicate respondents removed from analysis to maintain minimum expected count per cell. Values in bold indicate $\chi^2 < .05$ and adjusted residuals > 2.0 (Agresti, 2013)

¹Values in parentheses indicate expected frequencies for testing independence.

²Values in brackets indicate adjusted residuals.

Finally, the association between combined undergraduate and graduate level coursework between groups was also examined. In order to maintain the assumptions of Chi-square analysis, cells without groups the minimum expected count were excluded. This included responses lowest in frequency, including no exposure to fluency disorders at the graduate level ($n=4$, 1.9% of total responses [1 non-specialist, 3 specialists]), no exposure at the undergraduate level and completion of fluency coursework as part of another course at the graduate level ($n=5$, 2.3% of total responses [3 non-specialists, 2 specialists]), and exposure to a dedicated course at the undergraduate level

and part of another course at the graduate level ($n=11$, 5.3% of total responses [6 non-specialists, 5 specialists]).

A 2x4 Chi-square analysis was conducted on the remaining 199 respondents (88 non-specialists, 111 specialists). Four levels of exposure (i.e., “Part of an Undergraduate Course + Part of a Master’s Course,” “No Undergraduate Exposure + Dedicated Graduate Course,” “Part of an Undergraduate Course + Dedicated Graduate Course,” and “Dedicated Undergraduate + Dedicated Graduate Course”) and group classification (i.e., “specialists” and “non-specialists”) served as the categorical variables. Findings indicated a significant association between combined coursework and group, $\chi^2(1, n=199)=5.66, p=.017, \phi_c=.21$. As depicted in Table 3, a significantly greater proportion of respondents who completed a dedicated course in fluency disorders during both graduate and undergraduate programs self-identified as specialists in fluency disorders (50.5%) relative to non-specialists (36.4%; adjusted residual: 2.0). A significantly smaller proportion of fluency specialists (3.6%) completed coursework in fluency disorders as part of another course at both graduate and undergraduate levels than non-specialists (12.5%; adjusted residual: 2.4). However, this combination of educational experiences was infrequently reported across all respondents (i.e., 7.5%, $n=15$ of 199 respondents).

Table 3. Combined undergraduate and graduate level coursework by fluency specialists and non-specialists.

Graduate	No exposure			Partial course			Dedicated Course			Total	<i>p</i>	ϕ_c
Undergraduate	No exposure	Partial course	Dedicated course	No exposure	Partial course	Dedicated course	No exposure	Partial course	Dedicated course			
Specialists	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i> (8.4) ¹ [-2.4] ²	<i>5</i>	<i>28</i> (23.5) [.4]	<i>23</i> (28.3) [1.3]	<i>56</i> (49.1) [2.0]	111	.017	.21
Non-Specialists	<i>0</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>11</i> (6.6) [2.4]	<i>6</i>	<i>20</i> (21.3) [-.4]	<i>25</i> (21.2) [1.3]	<i>32</i> (38.9) [-2.0]	88		
Total	<i>0</i>	<i>1</i>	<i>3</i>	<i>5</i>	<i>15</i>	<i>11</i>	<i>48</i>	<i>48</i>	<i>88</i>	199		

Note. Effect size calculated using Cramer's V (ϕ_c). Significance indicated by p -values based on linear-by-linear association. Italicized values indicate respondents removed from analysis to maintain minimum expected count per cell. Values in bold indicate $\chi^2 < .05$ and adjusted residuals ≥ 2.0 (Agresti, 2013).

¹Values in parentheses indicate expected frequencies for testing independence.

²Values in brackets indicate adjusted residuals.

Clinical experiences. Two independent 2x4 Chi-square analyses were conducted to assess clinical exposure to child and adult fluency clients during clinical practicum by professionals who do and do not self-identify as specialists in fluency disorders. Four choices reflecting number of clients (i.e., “None,” “1 to 2,” “3 to 4,” and “5+”; Item 17) and respondent group (i.e., “specialists” and “non-specialists”) served as the categorical variables for analyses.

As depicted in Table 4, a Chi-square test for independence indicated a significant association between number of child clients seen during clinical training and specialization in fluency disorders, $\chi^2(1, n=219)=4.534, p=.033, \phi_c=.16$. A significantly greater proportion of fluency specialists were exposed to five or more child clients (14.8%) than non-fluency specialists (5.3%; adjusted residual: 2.3). As depicted in Table 4, a Chi-square test for independence also indicated a significant association between number of adult clients seen during clinical training and specialization in fluency disorders, $\chi^2(1, n=219) = 24.01, p<.001, \phi_c=.34$. Similar to child clients, a significantly greater proportion of specialists were exposed to five or more adult clients (18.9%) than non-specialists (1.0%; adjusted residual: 4.2). In contrast, significantly fewer specialists reported exposure to no adult fluency clients (23.8%) relative to non-specialists (46.5%; adjusted residual: 3.5).

Table 4. Number of adult and child fluency client served by fluency specialists and non-specialists as a student.

Children Who Stutter							
	None	1 to 2	3 to 4	5+	Total	<i>p</i>	ϕ_c
Specialists	27 (29.5) [-.8]	52 (53.5) [-.4]	25 (26.2) [-.4]	18 (12.8) [2.3]	122	.033	.16
Non-Specialists	26 (23.5) [.8]	44 (42.5) [.4]	22 (20.8) [.4]	5 (10.2) [-2.3]			
Total	53	96	47	23	219		
Adults Who Stutter							
	None	1 to 2	3 to 4	5+	Total	<i>p</i>	ϕ_c
Specialists	29 (41.2) ¹ [-3.5] ²	52 (42.6) [.1]	18 (15.6) [1.0]	23 (13.4) [4.2]	122	<.001	.34
Non-Specialists	45 (32.8) [3.5]	41 (41.2) [-.1]	10 (12.4) [-1.0]	1 (10.6) [-4.2]			
Total	74	93	28	24	219		

Note. Effect size calculated using Cramer’s *V* (ϕ_c). Significance indicated by *p*-values based on linear-by-linear association. Values in bold indicate $\chi^2 < .05$ and adjusted residuals ≥ 2.0 (Agresti, 2013).

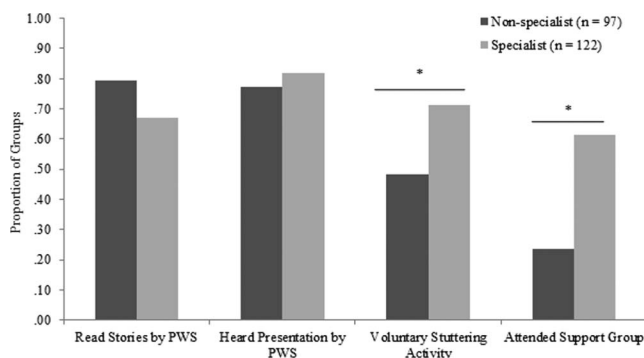
¹Values in parentheses indicate expected frequencies for testing independence.

²Values in brackets indicate adjusted residuals.

Fluency-related experiences. Four independent 2x2 Chi-square analyses were conducted to assess the association between specialization in fluency disorders and exposure to four fluency-related experiences. For each experience, “Yes”/”No” responses and respondent group (“specialist” and “non-specialist”) served as the nominal categorical variables. As depicted in Figure 4, Chi-square analyses indicated that two of the four student experiences were significantly associated

with self-report as a specialist in fluency disorders: completion of a voluntary stuttering task, $\chi^2(1, n=219)=11.89, p<.001, \phi=.23$, and attendance at a support/self-help group for people who stutter, $\chi^2(1, n=219)=31.17, p<.001, \phi=.38$. A significantly greater proportion of current fluency specialists experienced voluntary stuttering tasks (71.3%; adjusted residuals: 3.4) and support groups (61.5%; adjusted residuals: 5.6), than non-specialists (59.4% and 23.7%, respectively).

Figure 4. Fluency-Related Experiences During Student Training Reported by Fluency Specialists and Non-Fluency Specialists.



PWS=person who stutters; * indicates $\chi^2 < .05$ and adjusted residuals > 2.0

Discussion

Previous studies have investigated the educational and clinical training in fluency disorders for professionals in speech-language pathology without distinguishing between the experiences of respondents who do and do not specialize in fluency disorders. The purpose of this study was to examine if the academic, clinical, and specific fluency-related experiences for professionals who self-identify as specialists in fluency disorders differ from those who do not. Three main differences were observed between groups. First, completion of a dedicated fluency course during graduate studies was significantly associated with specialization in fluency disorders. However, this association was only maintained if the respondent had *also* completed a dedicated course at the undergraduate level. Second, extensive exposure to child or adult fluency clients (i.e., 5 or more) was reported by a significantly greater proportion of persons who self-report as specialists than non-specialists. Third, certain fluency-related experiences as a student, such as voluntary stuttering activities and attendance at a stuttering support group, were significantly associated with respondents who reported specialization in fluency disorders. These data provide preliminary support that academic and clinical exposure, as well as other fluency-related experiences, may increase the possibility that students will perceive themselves as competent in fluency disorders as they enter their professional careers.

Academic Experiences

A majority of respondents in the present study had completed a dedicated course in fluency disorders (84.0%, $n=219$), and at frequencies comparable to previous surveys (Kelly et al., 1997: 81%, $n=157$; Gabel, 2014: 90%, $n=141$). When specialist and non-specialist cohorts were compared, a significantly greater proportion of professionals who were exposed to a dedicated course in fluency disorders during graduate training reported increased self-perception of competency in fluency disorders, although overall rates remained similar between the two groups (specialists: 89.9%, non-specialists: 80.2%). These data are consistent with previous surveys that indicate many graduate programs offer a dedicated course in fluency disorders (77.4%, $n=123$ accredited programs; Yaruss & Quesal, 2002), and that this number has grown over the past decade (96%, $n=140$ accredited programs; Lee, 2014). Additionally, given the degree of overlap between

specialists and non-specialists (i.e., >80%), completion of a dedicated course may be necessary, but not sufficient, to describe the pre-professional training indicative of students who specialize in fluency disorders. Increased self-perception of competency in fluency disorders may be fostered, at least in part, by concentrated academic experiences as both an undergraduate *and* a graduate student.

In contrast to graduate coursework, less than half of all respondents (46.5%) received a dedicated course in fluency disorders at the undergraduate level. This rate is lower than the number of respondents who reported completion of a dedicated undergraduate course in older studies conducted (Kelly et al., 1997: 81%) and similar to more recent data (Gabel, 2014: 52%). These combined data are also consistent with the increasing number of undergraduate programs that allow students to graduate without any exposure to fluency disorders reported by Yaruss and Quesal (2002: 4%) and Lee (2014: 97%). Although comparison of undergraduate coursework between groups in the present study did not yield a significant association for either group when measured in isolation ($p=.431$), undergraduate exposure served as a mediating factor between groups when combined with graduate level coursework. Data indicate that completion of a dedicated graduate course remained significant only if the respondent had also completed a dedicated course in fluency disorders at both the undergraduate and graduate level. Specifically, the significant association between specialists and completion of a dedicated graduate course when measured in isolation (i.e., 107 of 119 specialists) was only maintained for approximately half of the respondents who had also received a dedicated undergraduate course in fluency disorders (56 of 111 specialists). It is possible the changes in ASHA standards discussed by Yaruss and Quesal (2002) may have had a greater effect on undergraduate curriculum. The lack of exposure as an undergraduate may limit preparedness for graduate school, which may, in turn, negatively compromise specialization in fluency disorders as students begin their professional careers. In fact, data from the present study suggest that having experience as both an undergraduate and a graduate is more likely to lead students to become stuttering specialists.

The primary goal of this study was to characterize a pre-professional profile for students who report to be specialists in fluency disorders beyond graduation. However, patterns observed for non-specialists also corroborate the potential consequences of inadequate exposure during undergraduate training. Of the few respondents who reported exposure to fluency disorders as part of another graduate course (31 of 215 respondents), a significantly greater number reported no specialized knowledge in fluency disorders (19 of 31, or 61.3%). Further, respondents with partial exposure at the undergraduate level *prior* to a dedicated graduate course were equally likely to identify as a specialist in fluency disorders as compared to those with no undergraduate exposure. Together, findings provide support for previous data that suggest limited academic exposure may limit professional comfort or competence in fluency disorders (e.g., Kelly et al., 1997; Tellis et al., 2008; Yaruss & Quesal, 2002). The present data extends previous studies by illustrating that students who consider themselves knowledgeable in fluency disorders were less likely to report no exposure or completion of only a partial course during their graduate or undergraduate curriculum.

Clinical Experiences

In addition to academic experiences, the present study examined the relationship between clinical experiences as a student and self-reported specialization in fluency disorders as a professional. Data indicated that exposure to a large number of fluency clients was associated with specialization in fluency disorders. Clinical interactions with five or more clients as a student was not common across respondents (children: 10.5 % of respondents; adults: 10.9% of respondents) but was reported by a significantly greater proportion of professionals who self-identified as a specialist in fluency disorders. Therefore, data suggest that the clinical experiences of fluency specialists as a student may be distinct from non-specialists.

The number of respondents who received zero treatment hours with fluency clients (child clients: 24.2%; adult clients: 33.7%) were lower relative to Kelly et al. (1997; 52% of respondents), higher than more recent data collected by Gabel (2014; 13% of respondents), and generally

consistent with the slight decrease in graduate programs that allow students to graduate with zero hours of clinical exposure (e.g., 65%: Yaruss & Quesal, 2002; 34%: Lee, 2014). That being said, the overall number of respondents across groups who received no clinical interaction with adult fluency clients in the present study was notably high (33.7%, $n=219$). Further, zero exposure to adult clients was reported in a significantly greater proportion of non-specialists (i.e., 46.4%) than specialists (23.8%). Thus, present data suggest that extensive clinical interactions with adults who stutter (as compared children) may uniquely facilitate specialization in fluency disorders.

The distinct relationship of adult clients versus child clients on professional expertise in fluency disorders was not expected, but not surprising in light of previous survey data. For example, respondents from Kelly et al. (1997) perceived themselves as least competent with adolescent and adult clients who stutter relative to children, particularly with regard to emotional aspects of clinical intervention. This report is similar to the 140 respondents in Gabel (2014), of whom only 13% felt successful treating adolescents and 1% felt successful treating adults. Thus, the importance of exposure to at least one fluency client, particularly an adult fluency client, may be a critical factor to future specialization. The precise reasons for this association remain speculative. However, given the relationship between fluency-related experiences and self-report as fluency specialists, it is possible that exposure to adult clients who are capable of describing their experiences with stuttering to young clinicians may generate a deeper understanding of the potential lifelong impact of fluency disorders.

Fluency-Related Experiences

Data from the present study suggest that certain fluency-related experiences as a student, such as voluntary stuttering and attending support/self-help groups, were significantly associated with specialization in fluency disorders. The unique relationship between voluntary stuttering and support group attendance as a student with self-identification as a fluency specialist suggests that the close, personal nature of these experiences may foster professional competence in fluency disorders more so than passive observation. For example, in the present study, a similar number of specialists and non-specialists reported hearing presentations or reading stories by people who stutter. These data support previous studies that suggest the greater the distance from the individual with the disorder, the less influential these experiences may be on young clinicians (e.g., Snyder, 2001). In contrast, present data support that the benefits of attending a stuttering support group may provide valuable insight not only for clients who stutter (e.g., Boyle, 2013; Trichon & Tetnowski, 2011), but also for professionals who provide these clinical services.

Although any exposure to individuals who stutter may lead to future decisions to specialize in stuttering, experiences that required internalization of the disorder (i.e., voluntary stuttering) or perhaps more intimate interactions with individuals who stutter (i.e., attendance at support groups) may promote a greater interest in stuttering. As observed for academic and clinical experiences, in contrast to non-specialists, current specialists reported distinct fluency-related experiences. What is particularly positive about these findings is that unlike academic or clinical experiences, these experiences may be more easily integrated into existing undergraduate and graduate curriculum.

Limitations

Several measures were employed to minimize the potential for non-response bias (e.g., increased sampling frame of surveys sent to non-specialists). However, the potential for response bias remained during survey administration, as the respondents were likely individuals with a unique interest in fluency disorders, and not necessarily representative of all professionals in the field. This may be particularly true for non-specialists given the low response rate relative to the number of targeted respondents (3.01%). However, the raw number of respondents ($n=219$) was comparable to previous survey studies (Gabel, 2014, $n=141$; Kelly et al., 1997, $n=151$) and more diverse in geographic distribution (i.e., 39 of 50 states) and occupational settings (i.e., schools, universities, hospitals, clinic/private practice) than previous studies restricted to school-based SLPs within a single state. Thus, the number of non-specialists may be lower than previous

studies but perhaps more representative of professionals in the field of speech-language pathology and the composition of college students within a typical classroom.

Differences in demographics within each sample warrant additional caution when comparing findings to previous survey studies. Unlike previous studies, respondents in the present study were not restricted to school-based SLPs (e.g., Gabel, 2014; Kelly et al., 1997; Tellis et al., 2008). Many of the respondents in the present study, particularly the specialists, did not report clinical service as part of their professional duties. In addition, unlike previous studies comparing fluency *specialists* versus fluency *generalists* (e.g., Crichton-Smith et al., 2003), the specialists in the present study were not restricted to formal certification. However, the more comprehensive definitions of each cohort in the present study is a strength and perhaps necessary due to the decreasing number of certified specialists in the field, as well as the decreasing number of professionals who hold a doctoral degree in fluency disorders. Nonetheless, direct comparisons to specialists from previous studies should only be made with consideration of these differences.

Finally, the descriptive data from the present study are preliminary in nature. The analyses conducted provide evidence to support an overall association between pre-professional experiences and specialization in fluency disorders. This association is not intended to suggest causality. A number of variables beyond the scope of the present study are likely to hold equal or greater predictive value. For example, the expertise of the academic instructors (e.g., Umbach, 2007) and clinical supervisors (e.g., Horton, Byng, Bunning, & Pring, 2004) may also contribute to self-perceived competency in fluency disorders. These and other factors (e.g., content covered within academic and clinical curricula [e.g., Molt & Barrow, 2013]; inherent characteristics of the novice clinician [e.g., Plexico et al., 2010]) warrant closer examination in future studies. Nevertheless, findings from the present study provide initial support that experiences as a student reported by professionals who specialize in fluency disorders may indeed differ from those who do not.

Implications for Academic Programs

Direct application of these findings to existing academic programs should be made with consideration of the noted contributing factors (e.g., instructor expertise, course content), as well as institutional limitations. As noted by Yaruss and Quesal (2002), it is important to remember that program size and number of faculty will certainly influence the ability to increase coursework at graduate or undergraduate levels. Modifications to curriculum may be further complicated by the upcoming changes recommended by ASHA and the Council of Academic Programs in Communication Sciences and Disorders (CAPCSD) regarding baccalaureate coursework. At present, ASHA's standards and implementation procedures to attain a Certificate of Clinical Competence in Speech-Language Pathology (Council for Clinical Certification in Audiology and Speech-Language Pathology of ASHA, 2013) do not provide specific expectations for undergraduate curricula, and acquisition of knowledge for all communication disorders, including fluency disorders, is expected to occur primarily at the graduate level (Standard IV-C). In response to a call by ASHA's Board of Directors to examine current models of undergraduate curriculum, ASHA's Academic Affairs Board [AAB] (ASHA, 2015) reviewed 86 academic programs that offered degrees in communication sciences and disorders (CSD). The AAB noted that due to the number of undergraduates in CSD programs who enter graduate programs in related fields (e.g., education, health care), undergraduate curricula should accommodate a more diverse student body by moving the CSD bachelor's degree away from a "narrowly focused credential training for practitioners to a broad-based degree providing pathways to careers in [related] fields [...]" (p. 4). Findings from the present study—particularly those related to undergraduate experiences—run counter to these and other recommendations to *deprofessionalize* the content of undergraduate coursework (e.g., Scudder, Aarts, Golper, & Groher, 2009; Wilcox, 2008). Instead, our preliminary data regarding undergraduate exposure—a level of training that receives little *empirical* attention within our field—serve as evidence that further consideration of current policies regarding undergraduate training within CSD programs is warranted before implementation.

Conclusion

The purpose of this study was to examine the relationship between student experiences and future specialization in fluency disorders. In sum, a significantly greater proportion of self-identified fluency specialists also report increased exposure to academic, clinical, and specific fluency-related experiences as an undergraduate and graduate student when compared to those who do not self-report as specialists in fluency disorders. While acknowledging the additional factors during training that may also contribute to specialized knowledge in fluency disorders, the present study provides preliminary data that suggest professional expertise may be associated with a pre-professional profile that is distinct from professionals who do not specialize in fluency disorders.

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Appendix A. Questionnaire

1. What is your current occupational setting? (Select all that apply)
 - (a) Clinic/Private Practice
 - (b) Public/Private School
 - (c) University Setting
 - (d) Hospital/Medical Setting
 - (e) Other (please specify) _____
2. What service(s) do you provide? (Select all that apply)
 - (a) Clinical
 - (b) Supervisory
 - (c) Teaching/Professorial
 - (d) Research
 - (e) Administrative
 - (f) Other (please specify) _____
3. In what state are you currently employed? _____
4. What is the most recent degree you've acquired?
 - (a) BA/BS
 - (b) MA/MS
 - (c) Clinical Doctorate
 - (d) PhD
5. Did you complete an undergraduate program that focused on the field of speech-language pathology? Yes No
6. Did you complete a graduate program that focused on the field of speech-language pathology? Yes No
7. What year did you acquire your MA/MS? _____
8. What year did you acquire your PhD or Clinical Doctorate? Select N/A if not applicable.
_____ N/A
9. Please describe your academic experiences with fluency disorders AS A STUDENT at the undergraduate level.
 - (a) No exposure
 - (b) Part of a required course which included topics other than fluency disorders.
 - (c) Part of an elective course which included topics other than fluency disorders.
 - (d) Elective course dedicated to fluency disorders.
 - (e) Required course dedicated to fluency disorders.

10. Do you recall the name of your undergraduate instructor in fluency disorders? Select N/A if you did not complete coursework in fluency disorders.
 Yes No N/A
 If so, please provide the name of your instructor.

11. To the best of your ability, please provide the following information. Select N/A if you did not complete coursework in fluency disorders.
- (a) Did your undergraduate instructor in fluency disorders hold a PhD?
 Yes No Do Not Recall N/A
- (b) Did your undergraduate instructor in fluency disorders stutter?
 Yes No Do Not Recall N/A
12. Please provide the name if the institution from which you earned your undergraduate degree. _____
13. Please describe your academic experiences with fluency disorders AS A STUDENT at the Master's level.
- (a) No exposure
- (b) Part of a required course which included topics other than fluency disorders.
- (c) Part of an elective course which included topics other than fluency disorders.
- (d) Elective course dedicated to fluency disorders.
- (e) Required course dedicated to fluency disorders.
14. Do you recall the name of your Master's-level instructor in fluency disorders? Select N/A if you did not complete coursework in fluency disorders.
 Yes No N/A
 If so, please provide the name of your instructor.

15. To the best of your ability, please provide the following information. Select N/A if you did not complete coursework in fluency disorders.
- (a) Did your Master's level instructor in fluency disorders hold a PhD?
 Yes No Do Not Recall N/A
- (b) Did your Master's level instructor in fluency disorders stutter?
 Yes No Do Not Recall N/A
16. Please provide the name if the institution from which you earned your Master's degree.

17. Estimate, to the best of your ability, the number of fluency clients seen AS A STUDENT during clinical practicum.
- (a) Adult Clients 0 1-2 3-4 5+
- (b) Child Clients 0 1-2 3-4 5+

18. Estimate, to the best of your ability, the number of fluency clients for whom you provided clinical services post-graduation.

(a) Adult Clients 0 1-10 11-20 21-30 31-40 41-50 51+

(b) Child Clients 0 1-10 11-20 21-30 31-40 41-50 51+

(c) Total Clients 0 1-10 11-20 21-30 31-40 41-50 51+

19. Please answer each question as accurately as possible.

I have authored or co-authored published research which focused on issues related to fluency disorders.	Yes	No
I am a member of SIG-4 (ASHA Special Interest Group 4 – Fluency Disorders)	Yes	No
I have completed board certification as a fluency specialist.	Yes	No
I have presented research at national conventions on topics related to fluency disorders.	Yes	No
I have provided lectures in a post-graduate academic setting on topics related to fluency disorders.	Yes	No
I have served as the primary instructor for a course dedicated to fluency disorders in an academic setting.	Yes	No
I have attended or participated in support groups related to fluency disorders (e.g., National Stuttering Association, Friends).	Yes	No
I have completed my MA/MS program, which included research/thesis related to fluency disorders.	Yes	No
I have completed my PhD program, which included research related to fluency disorders (select 'No' if not applicable).	Yes	No
Please include any additional that demonstrates your knowledge of fluency disorders.		

20. Do you consider yourself a fluency specialist or have specialized knowledge of fluency disorders? Yes No

21. Please describe the academic, clinical, or personal experience(s) that inspired you to specialize in fluency disorders. Responses can be as brief or extensive as you wish.

22. Please rate the level of influence each experience had on choosing a career in fluency disorders.

	Had this experience?	Had this experience, no influence	A little influence	Moderate influence	A lot of influence	Profound influence
Clinical interactions with people who stutter	Y/N	1	2	3	4	5
Academic exposure with stuttering or fluency disorders	Y/N	1	2	3	4	5
Participants in research activities related to fluency disorders	Y/N	1	2	3	4	5
Personal experiences with people who stutter	Y/N	1	2	3	4	5

23. Please indicate if you had the following experiences as a student and rate the level of influence each experience had on choosing a career in fluency disorders.

	Had this experience?	Had this experience, no influence	A little influence	Moderate influence	A lot of influence	Profound influence
Knowing someone personally who stutters	Y/N	1	2	3	4	5
Reading stories about the personal experiences of people who stutter	Y/N	1	2	3	4	5
Hearing presentations about personal experiences from a person who stutters	Y/N	1	2	3	4	5
Voluntarily stuttering in public	Y/N	1	2	3	4	5
Attending or participating in a self-help or support group for people who stutter (e.g., National Stuttering Association, Friends, etc.)	Y/N	1	2	3	4	5

24. How many workshops or conferences have you attended related to fluency disorders?

As an undergraduate or graduate student?	0	1	2	3	4	5+
After graduation?	0	1	2	3	4	5+

25. If you attended workshops or conferences related to fluency disorders, how much did this influence your career choice?

Had this experience, no influence	A little influence	Moderate influence	A lot of influence	Profound influence
1	2	3	4	5

26. Are you a person who currently or has ever stuttered? Y N

27. If yes, please rate the level of influence being a person who stutters has on choosing a career in fluency disorders.

Never had this experience	Had this experience, no influence	A little influence	Moderate influence	A lot of influence	Profound influence
N/A	1	2	3	4	5

28. Please feel free to provide any additional comments or questions.
