Speech Language Pathology Students' Expressive and Perceived Speech Rate

Elisa Pitchon[1], Heather Cadden[2], & Mark W. Pellowski[3]

Abstract

Purpose: This investigation assessed the relationship between speech-language pathology student-clinicians' expressive and perceived speech rate, and how it relates to the assessment and treatment of individuals who stutter or exhibit other communication disorders. **Method:** One hundred and five speech-language pathology graduate students participated. Expressive speech rates were calculated from conversational speech samples and perceived speech rates were obtained from a questionnaire. **Results:** Results indicated that the participants' average perceived speech rate was 257 words per minute (wpm) and their average expressive speech rate was 317 wpm. Survey results also indicated that the majority of student-clinicians perceived that their speech rate was appropriate, fluent, and important to consider when treating a client with a communication disorder. **Conclusion:** Findings from this investigation will hopefully aid in developing more effective speech rate modification procedures for speech-language pathologists who work with people who stutter or exhibit other communication disorders.

Keywords: Stuttering, Speech Rate, Clinician, Assessment, Treatment

Speech-rate awareness is essential for speech-language pathologists (SLP) who provide therapy to individuals who exhibit certain communication disorders, such as specific language impairment, hearing impairment, neurological disorders, apraxia, memory deficits, and stuttering (Logan, Roberts, Pretto, & Morey, 2002; Mauszycki & Wambaugh, 2008). With regards to stuttering, speech rate modification is a commonly used therapy technique in which a person who stutters intentionally changes his or her speech rate in order to facilitate communication and improve fluency (Conture, 2001). Indeed, many people who stutter will produce fewer disfluencies when utilizing a slower rate of speech (e.g., Andrews & Harris, 1964; Blomgren & Goberman, 2008; Johnson & Rosen, 1937; Runyan & Runyan, 1986) and the American Speech-Language-Hearing Association Special Interest Division on Fluency Disorders notes modification of speech rate as a technique SLPs can utilize when aiming to decrease stuttering behaviors (ASHA, 1995).

Treatment of fluency disorders may also involve a speech-language pathologist modeling a slow speech rate for a client and/or educating parents to modify their speech rate when communicating with their child (Guitar, 2014; Logan, et. al., 2002; Manning, 2001; Starkweather, Gottwald, & Halfond, 1990). Speech rate can be reduced or modified by decreasing articulatory rate (i.e., Slowing the speed at which sounds are produced), increasing the number or duration of pauses within an utterance, or increasing the duration of pauses between the turn-switching of partners during conversation.

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[1] Department of Audiology, Speech Language Pathology, and Deaf Studies, Towson University, Towson, MD, USA.
[2] Department of Audiology, Speech Language Pathology, and Deaf Studies, Towson University, Towson, MD, USA.
[3] Department of Audiology, Speech Language Pathology, and Deaf Studies, Towson University, Towson, MD, USA.

Speech rate modification treatment procedures can be implemented in a number of ways. For example, speech rate can be modified directly, whereby a client is explicitly instructed by a speech language pathologist (SLP) to change his/her rate by using a pacing board or speaking in unison with a metronome. A clinician would be expected to instruct the client to slow his/her speech rate by identifying and modeling appropriate speech rate targets, as well as trying to produce and highlight the difference between "slow" and "fast" speech rates (Conture, 2001). Alternatively, speech rate can be modified indirectly, which is a common practice when working with preschool children who stutter and their parents. In this scenario, the individual's communication partner (e.g., mother) would implement and model a slower speech rate when conversing with her child. When indirect speech rate modification is used, the speech language pathologist is usually responsible for training a parent or frequent communication partner to model a slow rate of speech using strategies that can be similar to those used with direct modification. Subsequently, parents are encouraged to implement a slower speech rate during activities when their child is most likely to be disfluent (Guitar, 2014; Kelly & Conture, 1992; Logan et al., 2002; Meyers & Freeman, 1985; Starkweather & Gottwald, 1990).

A number of studies have assessed the relationship between parental rate of speech and instances of stuttering in children (Guitar & Marchinowski, 2001; Guitar, Schaefer, Donahue-Kilburg, & Bond, 1992; Meyers & Freeman, 1985; Ryan, 2000; Stephanson-Opsal & Bernstein Ratner, 1988). Collectively, results from these studies generally suggest that faster speech rates exhibited by parents are associated with more instances of disfluent speech for young children who stutter. Parental speech rate modification was also shown to be successful in remediating stuttering in a case study whereby a 4-year-old child's mother was taught to slow her rate of speech, reduce the number of questions asked, use less complex sentences, avoid talking at the same time as her child, and allow for longer turn-taking pauses (Langlois & Long, 1988). Additionally, it has been reported that even in instances where parental speech rate modification did not influence a child's speech rate, stuttering instances still decreased (Guitar & Marchinkowski, 2001).

Andrews, O'Brian, Harrison, Onslow, Packman, and Menzies (2012) implemented a therapy technique that involved using syllable-timed speech (STS) in an attempt to decrease speech rate for children who stutter. When utilizing STS with children, the clinician models sentences or phrases using a specific rate, rhythm, and similar stress pattern while producing each syllable during connected speech. The child, in turn, participates in a conversation using the same rate that the clinician used in the model. Similar to many therapy techniques designed for improving communication with children, this treatment program was practiced during therapy sessions (with a speech language pathologist) and in the home with his/her parents. Andrews et al. (2012) reported that syllable-timed speech was highly effective for decreasing speech rate among children who stutter. Furthermore, the children exhibited a statistically significant decrease in stuttering and improved quality of life scores when administered this therapy program.

Although the effects of direct and indirect speech rate modification have been investigated for people who stutter and their communication partners, very few studies have assessed speech rate knowledge and use among speech-language pathologists who are working with these populations. Pellowski (2010) developed a questionnaire that assessed SLP's knowledge and use of various aspects of speech rate and their relationship to the assessment and treatment of people who stutter. His results suggested that the majority of the SLPs surveyed reported a lack of knowledge, confidence, and proficiency related to defining, measuring, and modifying speaking rate. Given the appropriateness and effectiveness of speech rate modification procedures for some individuals, it is vital that speech language pathologists, especially those who treat people who stutter, possess the ability to train their clients and communication partners in speech rate reduction. Clinicians (and student-clinicians) should also be able to monitor and modify their own speech rate in order to provide accurate models (e.g., slow and easy speech) when working with individuals who stutter or exhibit other communication disorders. In addition, little is known regarding the expressive (i.e., actual) and perceived speech rates of speech-language pathologists and student-clinicians who provide assessment and treatment services. If clinicians' perceptions of their speech rate do not align with their expressive (i.e., actual) speech rates, the type, quality, and effectiveness of treatment services may be unsuccessful.

Student-clinicians must also obtain appropriate training to familiarize themselves with speech rate modification techniques and become aware of ideal speech rates, so they can effectively assess and treat individuals who stutter during their graduate training and clinical internships. Unfortunately, many speech-language pathology students do not receive adequate training, education, or clinical experiences in the assessment and treatment of stuttering (Block, Onslow, Packman, Gray, & Dacakis, 2005; Pellowski, 2010, Yaruss and Quesal, 2002). As a result, speech-language pathology students would certainly benefit from receiving more information in the areas of speech rate awareness and speech rate modification at the undergraduate and graduate level, a time during which they begin acquiring clinical knowledge and direct training experiences. Given the above, the purpose of this investigation was to assess speech language pathology student-clinicians' expressive and perceived speech rates. To date, there are no known studies that have assessed these two variables and how they might relate to working with individuals who stutter or exhibit other communication disorders. It is hoped that these findings will broaden our knowledge in this area and help to enhance training procedures for future speech-language pathologists, which will subsequently benefit clients across the lifespan.

Method

Participants

The group consisted of 103 female and 2 male students, ranging in age from 21-40 years old (M = 24; SD = 2.9), who were enrolled in their first (n = 92) or second year (n = 13) of the graduate speech-language pathology (SLP) program at Towson University in Towson, Maryland. At the time of the study, all students volunteered to participate from SLP courses and clinical externship placements during the spring and summer semesters of their first year enrolled. Selection criteria required that all participants were full-time students and completed at least one university-based clinical internship placement during the fall semester of their first year of graduate study. Participants were notified that they would be audio recorded during an interview with a research assistant and subsequently complete a questionnaire (see Appendix). Finally, all participants were informed that they could withdraw from participating in the study at any time.

Procedures

Methodological procedures involved each participant conversing with a research assistant for approximately ten minutes in a sound proof (laboratory) room. The participants' expressive speech rate was derived from a 5-10 minute recording of the conversational speech sample. Specifically, ten fluent utterances were selected whereby a standard formula was used to calculate speech rate (e.g., total # words / total duration of words spoken [in ms.] x 60 = speech rate in words per minute). Participants subsequently completed a 10-item questionnaire that was designed to assess various aspects of their perceived speech rate and how it may relate to treating individuals who stutter (see Appendix). Responses for questions 1-9 were based on a 10-point Likert scale and the final question of the survey required participants to estimate their expressive speech rate in words per minute.

Results

Table 1 presents the participant responses for survey questions #1-9 based on a 10-point Likert scale. The majority of student clinicians (69%) indicated that they spoke at an average speech rate (rating 4-7), 31% of students indicated that they spoke too fast (rating 1-3), and 0% of students indicated that they spoke too slow (rating 8-10). Furthermore, 86% indicated that they spoke using an appropriate speech rate (rating 1-5), whereas 14% of students indicated that they spoke using an inappropriate speech rate (rating 6-10). The majority of students (79%) also indicated that their speech was highly fluent (rating 1-3) while treating a client, 21% indicated that their fluency was moderately fluent (rating 4-7), and 1% indicated that their speech was disfluent (rating 8-10). Seventy-six percent of the participants reported that they were very able to monitor and modify their speech rate when treating a person who stutters (rating 1-3), 22% were moderately able (rating 4-7), and 2% were not able to monitor and modify their speech rate (rating 8-10).

Almost all (i.e., 96%) of the participants reported that they were very willing to modify their speech rate when treating a person who stutters (rating 1-3), 2% were somewhat willing (rating 4-7), and 3% were not willing (rating 8-10). With regards to requests to slow down and repeat him or herself while talking, 20% and 23% were often asked (respectively; rating 1-5), whereas 81% and 77% were not often asked (respectively; rating 6-10). Finally, 95% of the students indicated that speech rate awareness is very important and has a high impact when treating a person who stutters (rating 1-3), 3% indicated that it is moderately important and has a moderate impact, and 3% indicated that it is not important and has a low impact.

Table 1: Percentage of participant responses based on a 10-Point Likert scale for questions 1-9 from the questionnaire (n = 105).

1) My speech rate:

Too Fast	1	2	3	4	5	6	7	8	9	10	Too Slow
	2%	4%	25%	39%	22%	8%	0%	0%	0%	0%	

2) My speech rate:

Appropriate	1	2	3	4	5	6	7	8	9	10	Inappropriate
	10%	18%	23%	19%	16%	7%	3%	4%	0%	0%	

3) My speech rate while treating a client:

Fluent	1	2	3	4	5	6	7	8	9	10	Disfluent
	13%	43%	23%	9%	8%	0%	4%	0%	1%	0%	

4) My ability to monitor and modify my speech rate while treating a person who stutters:

Able	1	2	3	4	5	6	7	8	9	10	Not Able
	22%	33%	21%	14%	2%	4%	2%	2%	0%	0%	

5) My confidence as a speaker:

Confident	1	2	3	4	5	6	7	8	9	10	Not Confident
	20%	23%	24%	11%	6%	5%	4%	7%	1%	0%	

6) My willingness to modify my speech rate while treating a person who stutters:

Willing	1	2	3	4	5	6	7	8	9	10	Not Willing
	83%	8%	5%	2%	0%	0%	0%	0%	0%	3%	

7) I am asked to slow down while talking:

	1	2	3	4	5	6	7	8	9	10	Not
Often	0%	2%	8%	8%	2%	8%	10%	15%	29%	19%	Often

8) I am asked to repeat myself while talking:

Often	1	2	3	4	5	6	7	8	9	10	Not Often
	0%	3%	6%	6%	8%	10%	15%	22%	13%	17%	

9) The importance/impact of speech rate awareness while treating a person who stutters:

Very Important / High Impact	1	2	3	4	5	6	7	8	9	10	Not Important / Low Impact
	67%	23%	5%	2%	0%	1%	0%	1%	0%	2%	

Figure 1 presents the average perceived and expressive speech rate (in words per minute) for the 105 participants. Specifically, their average perceived speech rate was 257 words per minute (SD = 66), whereas their average expressive speech rate was 317 words per minute (SD = 53). T-test results indicated a statistically significant difference between the two variables (t (104) = -7.16, p < .01). In addition, Figure 2 presents the relationship between perceived and expressive speech rate (in words per minute) for the 105 participants. Results of the correlational analysis indicated that there was no correlation between the two variables (r = -.04, p = .68).

Figure 1: Average perceived and expressive speech rate (in words per minute) for the 105 participants (t (104) = -7.16, p < .01).
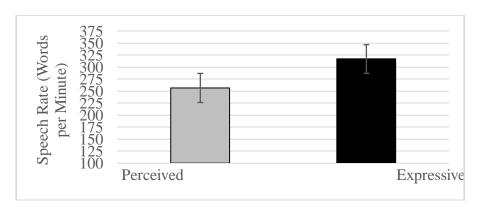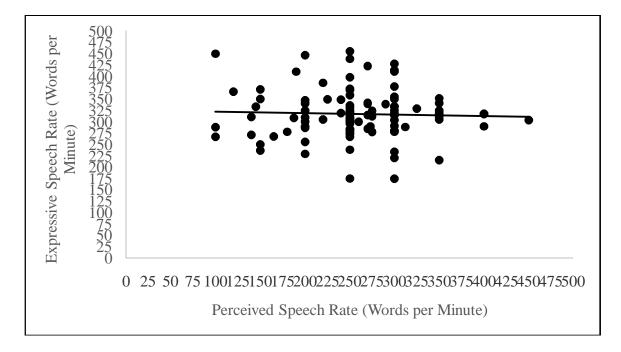

Figure 2: Relationship between perceived and expressive speech rate (in words per minute) for the 105 participants (r = -.04, p = .68).

Discussion

The purpose of this investigation was to assess the relationship between speech-language pathology student-clinicians' expressive and perceived speech rate, and how it may relate to the assessment and treatment of individuals who stutter or exhibit other communication disorders. Results indicated that the participants' average perceived speech rate was 257 words per minute (wpm) and their average expressive speech rate was 317 wpm. There was a statistically significant difference (but no correlation) between these two variables. Survey results also indicated that the majority of student-clinicians perceived that their speech rate was average and appropriate, and rated their speech as fluent. Finally, the participants reported that they were able and willing to monitor and modify their speech rate when treating a person who stutters.

This study also aimed to examine the clinical implications of these self-perceptions as they relate to speech rate modification, which is an important therapy procedure used to treat a variety of communication disorders (e.g., stuttering, apraxia, neurological disorders, language disorders, hearing impairments, etc. [Logan, Roberts, Pretto, & Morey, 2002; Mauszycki & Wambaugh, 2008]). When treating people who stutter, speech rate modification is a commonly used technique that has been reported to decrease instances of stuttering and improve fluency for many individuals (e.g., Andrews & Harris, 1964; Johnson & Rosen, 1937; Onslow, Costa, Andrews, Harrison & Packman, 1996; Runyan & Runyan, 1986).

Moreover, treatment of fluency disorders may also involve a speech-language pathologist modeling a slow speech rate for a client and/or educating parents to modify their speech rate when communicating with their child (Guitar, 2016; Logan, et. al., 2002; Manning, 2001; Starkweather, Gottwald, & Halfond, 1990). Therefore, a speech language pathologist (SLP) or student-clinician should be knowledgeable about and be able to model ideal speech rates, as well as to train clients and family members to use clinically appropriate and ideal speech rates. Along these same lines, it is important for clinicians and students to be aware and able to modify their own speech rate, in order to provide the most effective services. Conture (2001) has suggested that 160-180 words per minute is an ideal speech rate (i.e., appropriate and most beneficial) when working with a person who stutters and his/her conversational partner(s).

Current results indicated that, on average, the participants expressive (i.e., actual) speech rate was almost two times faster than what is considered to be an "ideal" speech rate when working with people who stutter (i.e., 317 vs. 160-180 wpm). Their speech rate was also considerably faster than normal adult speaking rates of 165 -230 SPM (Andrews & Ingham, 1971), although the majority self-reported themselves to possess average and appropriate speech rates and were not often asked to slow down or repeat him or herself while talking. Furthermore, there was no correlation between the participants perceived and expressive speech rate, and their expressive speech rate was 60 WPM faster than their perceived speech rate.

Given these findings, student clinicians should first become knowledgeable about normal and ideal speech rates, as well as how speech rate is measured and modified in varied clinical settings when working with people who exhibit different types of communication disorders. However, many speech-language pathology students may not receive adequate education in the assessment and treatment of stuttering; a course/field where speech rate could be a topic of instruction (Block, Onslow, Packman, Gray, & Dacakis, 2005; Pellowski, 2010, Yaruss and Quesal, 2002). None of the participants had completed a graduate-level fluency disorders course before participating in the current study. Therefore, various speech language pathology courses at the undergraduate level should perhaps include topics related to speech rate, including coverage of normal and clinically useful speech rates, as well as how it is measured and modified with people who exhibit communication disorders.

Additionally, student-clinicians (as well as speech language pathologists) should estimate their perceived speech rate and calculate their expressive speech rate *prior to* evaluating and/or treating clients when speech rate modification might be a clinical outcome or goal.

Indeed, if these two parameters are not aligned (e.g., expressive speech rate is faster than perceived speech rate; which current findings indicated), and/or if their expressive speech rate is too fast, clinicians would need to self-monitor, self-correct, and use other strategies if necessary, so their speech rate used in therapy is appropriate and effective when treating people who stutter (or people who exhibit other communication disorders), as well as training their conversational partners.

In sum, future research should include more participants from multiple and diverse locations and/or universities in an attempt to rule out any potential gender, cultural, or geographical differences or trends. To date, there are no known studies that have assessed the relationship between speech-language pathology student-clinicians' expressive and perceived speech rate, and how it may relate to the assessment and treatment of individuals who stutter or exhibit other communication disorders. Findings from this investigation will hopefully broaden our knowledge in this area.

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Appendix

Instructions: Please circle one number for each item to indicate your rating of that dimension. For example, for "My speech rate", a rating of "1" would indicate that you feel as though your speech rate is too fast, whereas a rating of "10" would indicate that you feel as though your speech rate is too slow.

1) My speech rate:3

Too Fast   1   2   3   4   5   6   7   8   9   10   Too Slow

2) My speech rate:

Appropriate   1   2   3   4   5   6   7   8   9   10   Inappropriate

3) My speech rate while treating a client:

Fluent   1   2   3   4   5   6   7   8   9   10   Disfluent

4) My ability to monitor and modify my speech rate while treating a person who stutters:

Able   1   2   3   4   5   6   7   8   9   10   Not Able

5) My confidence as a speaker:

Confident   1   2   3   4   5   6   7   8   9   10   Not Confident

6) My willingness to modify my speech rate while treating a person who stutters:

Willing   1   2   3   4   5   6   7   8   9   10   Not Willing

7) I am asked to slow down while talking:

Often   1   2   3   4   5   6   7   8   9   10   Not Often

8) I am asked to repeat myself while talking:

Often   1   2   3   4   5   6   7   8   9   10   Not Often

9) The importance/impact of speech rate awareness while treating a person who stutters:

Very Important/High Impact 1   2   3   4   5   6   7   8   9   10   Not Important/Low Impact

10) My speech rate in words per minute (WPM) is: _____ (Speech rates can range from 100-500 WPM).