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Teaching classic put to the test: Do tongue twisters work for L2 pronunciation?

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The Challenge

Within language teaching, many techniques have been in use for decades. Are these teaching "classics" used for a good reason? Is there research-based evidence on their positive effects on learning? This study addresses the issue by putting a controversial pronunciation teaching classic to the test with a mixed-methods research design.

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Abstract

Tongue twisters are a controversial pronunciation teaching classic. Whereas some see tongue twisters difficult and frustrating for learners, others find them fun and motivating. This study was inspired by these opposing views and the fact that previous studies have failed to offer convincing proof of whether this technique works for L2 pronunciation learning. This study approaches the question with a teaching experiment. Participants were 28 learners of L2 Swedish. Half of them trained with tongue twisters and half with authentic sentences. Training focussed on two sounds typically difficult for the learners, who were tested before and after the training period. Further, the participants were surveyed to grasp their tongue-twister experiences. Results reveal that tongue twisters were mostly viewed positively and lead to better pronunciation development than training with

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authentic sentences. Hence, the study demonstrates that tongue twisters now have research-based potential as a successful L2 pronunciation teaching technique.

1 | INTRODUCTION

Tongue twisters are a traditional pronunciation teaching technique, often recommended in teaching guides (e.g., Bonet, 1992, p. 109; Celce-Murcia et al., 2010, p. 10; Folse, 2006, p. 241; Walker, 2010, p. 77) and found in foreign language textbooks, as pointed out by, for example, Derwing and Munro (2015, p. 106). Widely known tongue twisters in English include *She sells seashells on the seashore* and *Peter Piper picked a peck of pickled peppers*. The idea is to train the pronunciation of a sound or sound contrast, which occurs excessively in the tongue twister. Compared to training a sound or sound contrast with other techniques, tongue twisters enable producing a great number of the target sound(s) during the training session. Hence, its possible effect may well derive from repetition. Tongue twisters are usually read repeatedly with an ever-increasing tempo (cf. the Russian equivalent of tongue twister, *skorogovorka* "rapid-talk") until articulatory collapse, making inevitable failure a key characteristic of the technique (Somoff, 2014).

It is impossible to estimate how common the actual use of tongue twisters is in teaching, but they seem to be of great importance at least in some countries, for example, in Russia (see Korolkova et al., 2015) and Indonesia, where many of the previous studies referred to in chapter 2 have been conducted. In a study by Szyszka (2016), Polish EFL teachers ($n = 78$) indicated the frequency of using tongue twisters in pronunciation teaching on a five-point scale (*1 = never, 5 = always*). Average scores varied between the levels of teaching (primary, lower secondary, upper secondary); primary-level teachers' average was the highest, 3.21, whereas upper-secondary school teachers' responses yielded the lowest average score of 2.75. Hence, tongue twisters seem to have a foothold also within EFL teaching in Poland.

Tongue twisters are folklore, but they have been used for various purposes and in various professional contexts. According to Potter (as cited in Somoff, 2014), they have been used by speech pathologists, dentists examining patients with new plates, police conducting sobriety tests, actors and radio announcers practising clarity of articulation; they have been recommended for stammering and lisping, and even as a cosmic curative for big mouths. The beginning of tongue twister scholarship can be placed to the late 19th century, when the origin of *Peter Piper picked a peck of pickled peppers* was discussed in scholarly publications (Somoff, 2014).

Reading tongue twisters is slow and cognitively challenging compared to reading regular sentences. In addition, pronunciation errors occur more frequently in tongue twisters, and the challenges of reading tongue twisters remains even when they are read silently (Keller et al., 2003). Difficulty of tongue twisters were earlier linked with working memory (see e.g., McCutchen et al., 1991), but later research has suggested that the difficulty rests mainly on articulatory processes (Robinson & Katayama, 1997). Neuroimaging results show that reading

tongue twisters activates a wider area in the brain compared to regular sentences (Keller et al., 2003). Hence, it seems that the phonological-articulatory loop (i.e., the components of working memory that store and revive phonological information, see Baddeley, 1986) is involved in the comprehension of tongue twisters. McCutchen et al. (1991) found evidence of the difficulty of tongue twisters not resulting from visual grapheme similarity but from phonemic interference. This seems obvious also based on Zhang and Perfetti (as cited in Robinson & Katayama, 1997), who used Chinese characters as test stimuli.

Within applied linguistics and foreign language teaching, tongue twisters have their proponents and opponents. Tongue twisters have been considered disguised drills (Walker, 2010, p. 77): they can be seen less boring, more motivating and fun (e.g., Zhang, 2014). Hancock (2006) views tongue twisters as word play. As is known, motivation is an important factor for learning. In Purcell and Suter (1980), learner's strength of concern for pronunciation accuracy, which can be interpreted as intrinsic motivation for learning pronunciation, was found one of four meaningful predictors for pronunciation accuracy.

Another idea to support the use of tongue twisters, presented in Korolkova et al. (2015), is that they can be viewed as a competitive task, which is something learners usually enjoy and find extra motivation for. Some scholars have, however, expressed criticism toward the tongue-twister technique. Despite the frequency of tongue twisters in teaching materials, Derwing and Munro (2015, p. 106), for example, do not recommend them, as they may cause extreme frustration for learners. Nation and Newton (2009, p. 82) as well are strongly against using tongue twisters as a pronunciation teaching technique, calling them a "cruel and unusual punishment" for learners. Both Derwing and Munro (2015, p. 106) and Nation and Newton (2009, p. 82) underline that tongue twisters are difficult to pronounce even for native speakers. In addition, tongue twisters can be criticised for not resembling real-life communication (see Hancock, 2006), and Zhang (2014) points out that students will lose interest in them, if used excessively.

Most importantly, the criticism includes that there is not much evidence of tongue twisters facilitating L2 pronunciation learning, as pointed out by Derwing and Munro (2015, p. 106). In general, there are few practical studies investigating the effects of different pronunciation teaching techniques (Derwing & Munro, 2015, p. 25). Hence, such research is on high demand. The aim of the present study is to gain research-based knowledge about tongue twisters as a pronunciation teaching technique. As scholars have been divided on learners' experiences about the technique (whether it is fun and motivating vs. frustrating), and previous research on whether tongue twisters can improve pronunciation is sparse, a teaching experiment was designed. The tongue-twister technique was compared to training with authentic sentences (i.e., everyday, simple sentences): one group used tongue twisters and another used authentic sentences. Both groups were tested for a selection of pronunciation features that the training focussed on. Testing took place before and after the training. In addition, learners were surveyed after the training period to grasp their views on the tongue-twister technique and its usefulness as for pronunciation learning. The following research questions were set for the study:

(1) How do learners experience tongue twisters as a pronunciation teaching technique?
(2) Can tongue twisters facilitate L2 pronunciation learning better than training with authentic sentences (i.e., everyday, simple sentences)?

This research is practically oriented. If our results support the view of Derwing and Munro (2015, p. 106) and Nation and Newton (2009, p. 82) on tongue twisters being more of a punishment for learners, and that they do not lead to better learning results than training with authentic sentences, tongue twisters cannot be recommended as a pronunciation teaching technique based on this study. In that case, it would make more sense to train with authentic sentences. In case the results suggest that learners find tongue twisters fun and motivating, and that they lead to learning results as good (or even better) than authentic sentences, tongue twisters can be recommended. Either way, research-based information about the usefulness of tongue twisters and learners' views on using them as a pronunciation teaching technique will be gained. This information will help teachers to assess whether or not to use this pronunciation teaching classic as part of their repertoire of techniques.

2 | REVIEW OF LITERATURE

The present study was inspired by the paucity of research done on tongue twisters as a pronunciation teaching technique. In fact, most efforts to shed light on the technique's effects lack an empirical approach and settle for reporting mere impressions and observations, or only demonstrate that training on tongue twisters is better than no training at all. For example, Turumi et al. (2016) successfully demonstrate how tongue-twister training can improve the pronunciation of English interdentals by L1 speakers of Indonesian; however, the learning results are compared to a control group, which did not receive explicit pronunciation teaching at all. Hence, the study tells nothing about the technique's efficiency in comparison to other pronunciation teaching techniques. In our view, there is plenty of evidence in favor of explicit (pronunciation) teaching. In the case of tongue twisters, it would be more fruitful to compare the learning results to another teaching technique, as tongue twisters have been critiqued for their difficulty and causing frustration.

Similarly to Turumi et al. (2016), Sitoresmi's (2016) study could only show that explicit teaching improves pronunciation, as no comparison to any other pronunciation teaching technique was included. In addition, testing to prove the learners' development is vaguely reported. A similar report was published by Masfirotul Uyun and Kumalarini (2014), who observed an L1 Indonesian-speaking learner, whose L3 English pronunciation was interfered by the learner's L2 French. Authors state that reading regular texts and teacher corrections had not resulted in developments, so tongue twisters were introduced instead. The learner was observed reading tongue twisters without training and after 2 weeks of independent practice. As judged by the teacher, the learner made progress in reading the tongue twisters but was not able to overcome their pronunciation difficulties; in other words, the French-accented features remained. Hence, both positive and negative impressions on the effects of the tongue-twister technique have been reported, but none of these studies can be considered a systematic empirical investigation that would reveal if tongue twisters are an efficient teaching technique if compared to other forms of training.

As for learners' views regarding the technique, Masfirotul Uyun and Kumalarini's (2014) case study participant stated having enjoyed the process, whereas Sitoresmi's (2016) participants not only enjoyed the training but also improved their motivation, became more active and self-confident, their awareness of using correct pronunciation improved, and atmosphere in class turned into more relaxed and exciting. Unfortunately, the report does not reveal how these results were obtained; at least some of these aspects were inquired from the

learners, but how is left unspecified. Some of the conclusions may have been made based on mere impressions by the researcher.

A twofold learner experience is presented in a reflective paper by Hilton (2014), whose tongue-twister learning experience overwent a drastic change after learning the meanings of words used in the tongue twisters. Their Chinese teacher had the learners perform a tongue twister in front of the class each session without making sure that learners understood the words. At first, this was Hilton's least favorite part of the course, and they state having hated the exercise type. However, the technique opened on a new level when learning all the words and understanding the tongue twister. In the end, they believed reciting tongue twisters might actually improve their pronunciation, but no empirical study was conducted to support this view.

The most systematic study (as for research design and reporting) on tongue twisters for pronunciation training seems to be by Mu'in et al. (2017), who investigated the development of English vowels by L1 Indonesian learners with two techniques: tongue twisters and repetition of individual words. After 14 training sessions, vowel production of the participants was tested. In addition, the participants took a questionnaire to express their views on the learning experience. The study reveals no statistically significant difference between the scores obtained by the two groups, even though the mean score of the tongue-twister group was slightly higher than the repetition group's (86.2 vs. 81.8 out of a score of 100). Hence, the tongue-twister technique cannot be assumed to be any better in comparison to repeating individual words, as the differences may be explained by chance. In addition, the study does not reveal how the participants developed during the teaching experiment, as no pretest was conducted to map the participants' initial pronunciation skills. According to the questionnaire, learners found the tongue-twister technique good pronunciation practice, helping them develop their English vowels and overall fluency. Also, they found the training motivating.

In sum, learner views on using tongue twisters are generally positive and far from viewing it a "cruel punishment" (Nation & Newton, 2009, p. 82), and learners seem to believe that the technique can improve their pronunciation. However, many of the abovementioned articles are unclear about how these views were obtained. In any case, learners' belief in tongue twisters being beneficial for their pronunciation learning is shared by North American ESL teachers ($n = 58$). The majority of the participants in a study by Thomson (2013) were of the opinion that "comparative sounds, alliteration, and tongue twisters can be used as drills to help improve your pronunciation." Whether or not tongue twisters facilitate pronunciation learning—especially compared to other pronunciation teaching techniques—requires further investigation, as none of the previous studies have been able to satisfactorily tackle this question.

3 | METHODS

3.1 | Participants

Participants of the present study were adult advanced L1 Finnish learners of Swedish based in Finland. They were chosen among students who took part in a pronunciation and oral skills course in Swedish. Students studied in two separate groups. The tongue-twister teaching experiment was conducted in one group, whereas the other group trained with authentic sentences. All students took part in the teaching, but students whose development was analysed for the present study were selected. Participant selection criteria included that they

volunteered for the research, were not bilingual from birth, and did not have close connections (family/friends) to speakers of Swedish.

Following these criteria, 14 learners were selected from Group 1 (tongue-twisters). Out of them, 3 were male and 11 were female. As for Group 2 (authentic sentences), which was bigger to begin with, 14 learners (all female) were randomly chosen among those who met the above criteria. This was done to match the number of participants in the other group. Hence, pronunciation development of 28 learners was investigated in this study. In Group 1, the learners' age ranged from 20 to 39 years, the mean being 23.8 and median 22 years. Group 2 had learners from 19 to 25 years old, with the mean of 19.9 and median of 20 years. All learners were students at tertiary level, pursuing a degree in modern languages, Swedish being their major or minor subject. Most of the participants intended to work as a Swedish as a second language teacher after their graduation, which requires attaining a good command of Swedish pronunciation and being able to teach it to students. Before their university studies, they had studied Swedish for 6 years as part of their secondary schooling. Their overall proficiency was not tested in connection to the present research, but according to their teacher's estimation, they had all reached the level of independent language user (B1–B2 on the CEFR scale). In addition to Swedish, all participants had studied English. As for any additional languages, the participants' language learning history was not mapped, but because the Finnish school system offers excellent language learning opportunities in form of elective courses (e.g., German, French, Spanish, and Russian), it is likely that some of the participants had studied additional languages.

3.2 | Teaching experiment

3.2.1 | Context

The teaching experiment was conducted in connection to an oral skills course in Swedish. The course consisted of 12 90-min sessions within 6 weeks, but the teaching experiment was limited to six 15-min slots within 3 weeks. In other words, 15 min of the six first sessions of the course were dedicated to the learning goals set for the experiment. With this setting, the aim was to simulate a common scenario from a general-skills language class, in which a short portion of class time is devoted to pronunciation training. Total time spent on the experiment was approximately 90 min. The course was taught by an experienced teacher-researcher with a specialisation on Swedish pronunciation and phonetics. Both groups were taught by the same teacher.

3.2.2 | Learning goals

Due to the limited time of the experiment, it was decided to limit the learning goals to two sounds that are typically challenging to the learner group in question: /ʉ/ and /ʃ/. More specifically, the teaching experiment focused on the long allophone of /ʉ/ and /ʃ/ before a stressed vowel. To name but a few examples, the vowel occurs in words such as *jul* "Christmas" and *hus* "house," and the consonant occurs in words such as *stjärna* "star" and *själ* "soul." As is common in the teaching context of Finland, the learners studied the phonology of both Sweden-Swedish and Finland-Swedish (a distinct variety of Swedish spoken in Finland, see

Helgason et al., 2013) but could choose the target variety for their own pronunciation. Hence, some of the participants aimed for Sweden-Swedish, whereas some aimed for Finland-Swedish. This resulted in the learning goals being slightly different, depending on the target variety. In Standard Finland-Swedish, the vowel [ʉː] (=the long allophone of the phoneme /ʉ/ that occurs in our materials) is pronounced as a close central vowel, yet somewhat closer to [uː] than [yː] (Kuronen, 2000). In Standard Sweden-Swedish, the long allophone of /ʉ/ is pronounced more fronted than in Finland-Swedish and can be transcribed [ʉ̟ː] in the IPA script (subscript "+" means "advanced"), that is, it is a rounded close front vowel, resembling [yː] but little less fronted (Kuronen, 2000). The most common allophone of /ʃ/ in Finland-Swedish is a predorsoalveolar fricative [ʃ] (with some variation in the details of place and manner of articulation; cf. Leinonen, 2004, pp. 27–38). In Sweden-Swedish, /ʃ/ is often pronounced as [ɧ] (a dorsopostpalatal fricative) or [x] (a dorsovelar fricative). In Sweden-Swedish, also the pronunciation of /ʃ/ as [ʃ] (a predorsoalveolar fricative) or [ʂ] (a prepalatal, retroflex fricative) is not uncommon (for details see Riad, 2014, pp. 60–62).

These two sounds—/ʉ/ and /ʃ/—are difficult for L1 Finnish learners of Swedish firstly because they do not exist as phonemes in Finnish (Suomi et al., 2008, p. 25). Second, /ʉ/ and /ʃ/, especially the common allophone [ɧ] in Sweden-Swedish, can be considered as marked sounds (cf. Markedness Differential Hypothesis; Eckman, 1977, 2008). In many studies, /ʉ/ and /ʃ/ have been shown to be difficult for L1 Finnish learners (on Sweden-Swedish as L2 see Bannert, 1984; on Finland-Swedish as L2 see Kautonen, 2018). The sounds cause difficulties for many learners of Swedish, not just L1 Finnish learners (Bannert, 1984). Especially /ʉ/ is difficult. Also, [ɧ] has shown to be challenging for many L2 learners of Swedish despite their L1.

3.2.3 | Materials and procedures

In the beginning of the experiment, the learners in both groups were introduced to the target sounds and their pronunciation. This included an introduction to relevant phonetic terminology, phonetic description of the target sounds and their allophones (manner and place of articulation) and the teacher providing a model pronunciation for example words. In addition, vowels were demonstrated with help of a vowel formant chart and an interactive chart, which enables listening to the vowels. Finally, the target sounds were contrasted with Finnish phonemes, and the participants were given readings. The training that followed consisted of repeating the materials after the teacher, reading them aloud without the teacher's model pronunciation both alone and in pairs, recording the materials, and listening to one's own recordings, and listening in pairs. Pair activities were included to see whether this would increase nervousness or anxiety (cf. Hilton, 2014). In addition, the participants were encouraged to practise at home, using the materials they used in class. Teacher feedback was not included in this teaching experiment, but in connection to the pair activities, the participants had an opportunity to briefly comment on each other's pronunciation. The teacher gave pronunciation feedback later during the course, when data collection for the present study had ended.

Group 1 trained with tongue twisters, which were selected and partly modified by the authors from pre-existing materials. Training included the element of reading them with an ever-increasing tempo (Somoff, 2014). Each tongue twister was introduced as a simplified version before moving on to the full version, see examples in Table 1. The complete list of materials is found in the Appendix. The tongue-twister training materials consisted of six

TABLE 1 Examples of tongue twisters used in the teaching experiment.

Simplified tongue twister	Full version
Sture kastade spjut i pyjamas.	Sture kastade spjut i pyjamas men Stures spjut spräckte pyjamasen i tu.
Sju hekto skinka skickas till Skepparegatan.	Sju hekto skinka, skäres i skivor, skickas till Skepparegatan 77, Sjögren på skylten.

Note: English translations are available in the Appendix.

simplified and six full versions, including a total of 47 occurrences of the target sounds. The decision to use simplified versions derived from the strongly opposing views of Nation and Newton (2009, p. 82) and Derwing and Munro (2015, p. 106); introducing the full versions after training with simplified ones was seen as an opportunity to overcome possible frustration. In addition, the tongue twisters consisted of vocabulary mainly familiar to the participants.

Instead of tongue twisters, Group 2 trained with authentic sentences, most of which included one or two target sounds per sentence. The training material with authentic sentences consisted of 22 sentences including 38 occurrences of the target sounds. Examples of such sentences are *De målade huset gult i somras* (They painted the house yellow last summer) and *Tycker du om choklad?* (Do you like chocolate?). These materials were designed by the authors and used similarly to how Group 1 trained with tongue twisters, except for reading them with an ever-increasing tempo. Group 2 worked on the sentences with a tempo that best suited them. As is obvious, the number of produced target sounds during the 15-min training sessions was lower for this group. This highlights the difference between the two teaching techniques under investigation, along with pace and degree of difficulty.

3.3 | Testing

Both groups were tested on their production of the target sounds before and after the 3-week training period. Testing took place in a language laboratory in the beginning of session 1 and in the end of session 6. The posttest was identical to the pretest. Test materials consisted mainly of read-aloud authentic sentences, but tongue twisters were included as well. All test materials were new to the participants, that is, course materials were not used as such in the test. However, a few individual words occurred in the training materials as well as the testing (see Appendix).

In the test materials, the two target sounds occurred as follows: /ʉ/ 10 times in authentic sentences and four times in tongue twisters, and /ʃ/ 10 times in authentic sentences and six times in tongue twisters. Altogether, the test consisted of 30 occurrences of the target sounds. As the participants took the test twice (pretest and posttest), each participant produced the target sounds 60 times. The total number of analysed sounds is 1680, which means that the study is based on a vast amount of data.

Learners' productions were judged as either correct or incorrect (1/0 points) by author B, who is an experienced teacher-researcher with a specialisation in Swedish pronunciation and phonetics. Judging was preceded by listening to the recordings together with author A, discussing and negotiating judgment criteria. As a result, author B had clear criteria as for which pronunciations to judge as correct and which as incorrect. As Finland-Swedish and

Sweden-Swedish are mutually intelligible, we did not make a difference between the varieties when judging the learners' productions. In other words, typical pronunciations—either Finland-Swedish or Sweden-Swedish—of the target phonemes were accepted no matter which variety the learner aimed for. In assessing the productions, author B relied on the ear but used a Praat spectrogram (Boersma & Weenink, 2019) to support the judging. Each production was listened to up to five times. For details, see Section 3.5.

3.4 | Learner questionnaire

After the teaching experiment, the learners were invited to take an online questionnaire. The questionnaire was taken by 14 learners from Group 1 (tongue twisters) and 13 learners from Group 2 (authentic sentences). Altogether, the number of recipients was 27. The questionnaire was used to explore Group 1's views on the tongue-twister technique, as conflicting claims about learners' views on tongue twisters have been presented in previous literature. In addition, the survey sought to obtain information about the amount of training outside contact teaching. In teaching experiments, it is naturally difficult to control for the participants' training outside of class; yet, we wanted to get at least some kind of an understanding of how often they practised pronunciation at home and how much time they spent on it. These questions were directed to both groups of learners, whereas the questions dealing the tongue-twister experience was self-evidently for Group 1 only. Questions about the technique inquired the learners' views on the usefulness of tongue twisters, tongue twisters being easy/motivating/difficult/frustrating, and the possible nervousness linked to pair activities. These questions were answered on a 4-point Likert scale with an additional option to reply "I don't know." In addition, the questionnaire included an open-ended question about the tongue-twister experience.

3.5 | Analyses

As the number of recipients was low, the Likert scale results were analysed by mere descriptive means. As for the analysis of the open-ended question, qualitative content analysis was used as a method. The descriptions of the learners' tongue-twister experiences were carefully read and searched for links to the Likert scale results. These links were used to add to and complement the Likert scale results.

To investigate the learners' development in pronunciation, each individual's points from the posttest were compared to the points received in the pretest. This was done separately for the two target sounds and the two material types, that is, /ʉ/ in authentic sentences ($n = 10$), /ʃ/ in authentic sentences ($n = 10$) and target sounds in tongue twisters ($n = 10$). Accordingly, the maximum points for each of the three analysis categories was 10. Calculating the scores separately enabled us to exclude the learners who were "too good" already in the pretest. This was done, as such learners could simply not make much progress during the teaching experiment and would therefore skew group comparisons. The bar was set at two errors: a learner was excluded if they missed less than two out of 10 points within a category in the pretest. In addition to the too good learners, two participants were partly excluded, because they had not completed the test and some test items were therefore missing.

To compare Group 1 (tongue twisters) and Group 2's (authentic sentences) development with each other, group comparisons were conducted. Group comparisons were calculated with

all of the data to determine whether there was a difference between the groups on the whole. In addition, group comparisons were conducted material type wise. This analysis derives from the natural assumption, according to which learners would develop better when it comes to the material type they trained with: Group 1 might develop better in tongue twisters, whereas Group 2 might develop better in authentic sentences. It was also in the authors' interests to explore whether skills learnt with one material type would transfer to another material type.

All group comparisons were tested for statistical significance using *Wilcoxon signed ranks* test, which is a nonparametric test for paired-samples data with small sample sizes and/or data that is not normally distributed. As testing statistical significance only proves that the observed differences cannot be explained by chance, the analyses were complemented by calculating effect sizes with *Cohen's d* (Cohen, 1988). This analysis is used to determine whether the observed difference actually has an effect. Effect sizes were interpreted following the general guidelines: small effect >0.2, medium effect 0.5–0.8, large effect 0.8–1.3. According to Hattie (2009), 0.4 can be considered a criterion threshold for pretest–posttest settings.

4 | RESULTS

4.1 | Learner questionnaire

Overall, the majority of learners in Group 1 found training with tongue twisters a positive experience, as demonstrated in Table 2. They agreed on tongue twisters helping them improve their pronunciation of the target sounds and speech fluency (*fully agree* and *partly agree*

TABLE 2 Learners' ($n = 14$) views on tongue-twister training.

	Fully agree	Partly agree	Partly disagree	Fully disagree	I don't know
Tongue twisters helped me improve pronunciation of sounds.	3	9	1	1	-
Tongue twisters helped me improve speech fluency.	1	9	3	1	-
I liked tongue-twister training.	7	4	2	1	-
Tongue twisters were easy to pronounce.	-	6	5	3	-
Training with tongue twisters was boring.	-	1	8	4	1
I would have preferred training with authentic sentences.	2	3	8	-	1
Tongue twisters motivated me to learn pronunciation.	4	6	-	1	3
Tongue twisters were too difficult, so I got frustrated.	1	1	4	8	-
I was nervous when doing pair activities.	-	2	2	9	-
Tongue twisters created a relaxed atmosphere in class.	3	9	1	-	1

combined). In addition, they liked the training and felt it motivating. Moreover, the majority agreed on tongue twisters creating a relaxed atmosphere in class. Learners were quite united on the training not being boring, and only two learners agreed to have felt nervousness in connection to pair activities. Similarly, two indicated to have felt frustration based on tongue twisters being too difficult to pronounce.

The open-ended question supported the above results and gave further insights into the results gained by the Likert scale questions. Several learners described the training as fun and useful. These views were further defined by novelty, relaxed atmosphere, and focus on one feature at a time. In other words, factors that make tongue twisters fun for the learners include the exercise type being new to them. This is demonstrated by Example 1.

Example 1. *Harjoittelut olivat mielestäni todella hauskoja! En ole ikinä aikaisemmin tehnyt kyseisiä harjoituksia, joten oli kiva tehdä jotain erilaista.*

[I found the training really fun! I have never done such exercises before, so it was nice to do something different for a change.]

In addition, the training can be viewed less serious compared to some other exercise types, and this creates a relaxed atmosphere in class (Example 2). The usefulness of tongue twisters was linked to repetition, as demonstrated by Example 3.

Example 2. *Ei niin vakavaa vaan juuri hauskan kepeää, samalla kuitenkin oppii uusia sanoja ja teoriaa käytännössä kuin huomaamatta.*

[Not so serious but just fun and light. At the same time, you learn new words and theory in practice, without even noticing.]

Example 3. *Harjoitukset olivat hauskoja ja hyödyllisiä, koska ne keskittyivät hyvin intensiivisesti tietyn äänteen ääntämiseen. Ääntäminen jäi hyvin mieleen kun se toistui useasti samassa lauseessa.*

[Exercises were fun and useful, because they focused very intensively on the pronunciation of a certain sound. Its pronunciation was easily learned as it occurred several times in one sentence.]

The open-ended question also shed light on the difficulty of tongue twisters. While the learner in Example 1 found it useful to repeat a sound several times in one tongue twister, another learner found it confusing and would therefore have preferred training with authentic sentences in addition to tongue twisters. The results of the learner questionnaire also pointed out that tongue twisters can be frustrating; see Example 4.

Example 4. *Tuskastuttavan vaikeita lausuttavia, turhauttavia harjoituksia.*

[Agonizingly difficult to pronounce, frustrating exercises.]

A vast majority of the learners (21 out of 27) indicated that they practiced their pronunciation at home 1–2 times a week during the teaching experiment. Practising on free time took less than an hour a week for 17 learners, whereas five learners stated to have spent at least an hour, and five learners at least two hours. There was a minor difference in the amount of practice between the groups: the majority of Group 2 (authentic sentences) spent less than an hour, whereas Group 1 (tongue twisters) was evenly distributed between spending less than an hour and spending 1–2 h.

To sum up, the learners' views toward tongue-twister training was overall positive with very few exceptions. Hence, there is no reason for automatically abandoning the technique, thinking that learners will find it frustrating. Yet, it needs to be acknowledged that some might, as demonstrated by the present study. Still, assessing the usefulness of tongue twisters will mostly lie on the learning results, which will be presented in the coming sections.

4.2 | Pronunciation development: Tongue twisters versus authentic sentences

As explained in Section 3.5, learners were excluded from the analyses, if they were too good to begin with or had not finished the test. However, the exclusion was applied category by category. Hence, exclusion from one category did not automatically lead to exclusion from other categories. When calculating group comparisons, it was possible to partly include the learners. For example, learner #001 achieved too well in the pretest for /ʉ/ in sentence, but was included in the analysis for /ʃ/ in sentence and for the tongue-twister data. Excluding the learners category by category explains the uneven number of target sounds produced in the group comparisons.

All learning results combined, it is clear that Group 1 (tongue twisters) outperformed Group 2 (authentic sentences). Group 1 was able to improve their average score from 57% correct in the pretest to 82% correct in the posttest, which means a development of 25%-points. Group 2 was also able to improve their scores, but their development was only 14%-points. The results are statistically significant for both groups, and they are presented in Table 3 below. Effect sizes proved small for both groups, but Group 1's effect reached the threshold level of 0.4 (Hattie, 2009).

To briefly describe the participants' development, the typical challenges in the pretest included producing /ʉ/ as a back vowel /u/, familiar to the participants from their L1, and /ʃ/ as /s/ or /tʃ/. In addition, spelling-induced challenges were common, for example, pronouncing

TABLE 3 Group-wise development in the production of Swedish /ʉ/ and /ʃ/ and statistical significance and effect size as measured by Wilcoxon signed ranks (Z) and Cohen's d.

Group	Number of target sounds produced	Pre-test score	Posttest score	Development	Z	p	D
1 (tongue twisters)	360	204 (57%)	295 (82%)	+91 (+25%-points)	−8.148	.000***	0.48
2 (authentic sentences)	340	136 (40%)	185 (54%)	+49 (+14%-points)	−4.530	.000***	0.25

***p < .001.

**p < .05.

*p < .01.

the beginning of *giraff* as /g/ instead of /ʃ/. The most prevalent improvements detected in the posttest were that the back vowel /u/ appeared only seldom, and the spelling-induced challenges were commonly reduced.

4.3 | Learners' individual development

To obtain more detailed results, learners' individual development was also analysed in both groups. Table 4 below presents the development of those learners, whose test scores were considered for all categories, that is, they produced all 30 test items in both pretest and posttest and were not excluded based on too good performance in the pretest. Results reveal that most learners had challenges in the pretest: the scores ranged from 7 to 22 out of 30. In the posttest, the range of scores was from 8 to 29. Development ranged from 0 to 14 points. However, the Wilcoxon signed ranks test reveal that the development observed in some of the learners was not statistically significant.

The results clearly show that learners in Group 1 (tongue twisters) were prone to greater development: In Group 2 (authentic sentences), the improvements were typically minor, whereas most of the learners in Group 1 reached greater improvements. In addition, Group 1 development

TABLE 4 Learners' individual development in the production of Swedish /ʉ/ and /ʃ/ ($n = 30$) and statistical significance and effect size as measured by Wilcoxon signed ranks (Z) and Cohen's d.

Learner	Group	Pretest score	Posttest score	Difference	Z	p	D
#003	1	20 (67%)	26 (87%)	+6 (+20%-points)	−2.121	.034*	0.41
#004	1	20 (67%)	28 (93%)	+8 (+26%-points)	−2.828	.005**	0.59
#005	1	22 (73%)	29 (97%)	+7 (+24%-points)	−2.646	.008**	0.54
#008	1	11 (37%)	22 (73%)	+11 (+36%-points)	−3.051	.002**	0.66
#010	1	19 (63%)	28 (93%)	+9 (+30%-points)	−2.714	.007**	0.56
#011	1	15 (50%)	27 (90%)	+12 (+40%-points)	−3.207	.001**	0.71
#013	1	17 (57%)	19 (63%)	+2 (+6%-points)	−0.500	.617	-
#014	1	9 (30%)	23 (77%)	+14 (+47%-points)	−3.742	.000***	0.92
#015	2	9 (30%)	19 (63%)	+10 (+33%-points)	−2.500	.012*	0.50
#017	2	7 (23%)	8 (27%)	+1 (+4%-points)	−0.378	.705	-
#019	2	12 (40%)	12 (40%)	0	0.000	1.000	-
#022	2	18 (60%)	21 (70%)	+3 (+10%-points)	−0.905	.366	-
#023	2	8 (27%)	20 (67%)	+12 (+40%-points)	−3.464	.001**	0.80
#024	2	8 (27%)	16 (53%)	+8 (+26%-points)	−2.138	.033*	0.42
#026	2	14 (47%)	17 (57%)	+3 (+10%-points)	−1.134	.257	-
#027	2	9 (30%)	11 (37%)	+2 (+7%-points)	−0.707	.480	-
#028	2	9 (30%)	9 (30%)	0	0.000	1.000	-

***$p < .001$.
**$p < .05$.
*$p < .01$.

reached statistical significance in all cases but one, and with medium or large effect sizes except for #003, whose development had a small effect. Group 2 only had three learners (#015, #023, #024), who demonstrated a statistically significant difference between pretest and posttest scores. Their development showed small (#024), medium (#015), and large (#023) effect sizes.

4.4 | Development by material type

For further comparisons between the two groups, the results were analysed by material type. As expected, Group 1 (tongue twisters) developed well in tongue twisters, whereas Group 2's development was more modest. While Group 1 increased their number of correctly produced sounds by 21%-points, Group 2's development was only 14%-points. Both groups' difference between pretest and posttest was statistically significant and with small effect sizes. There are, however, differences in the *p*-values and effect sizes in favor of Group 1, which is not surprising, as that group practised on tongue twisters. The results for development in the target sounds in tongue twisters are presented in Table 5.

Interestingly, Group 1 developed well also in authentic sentences (Table 6), which demonstrates that they were able to transfer the skills learnt by tongue-twister training to another context. In fact, their development was slightly better in authentic sentences than in

TABLE 5 Group-wise development in the production of Swedish /ʉ/ and /ʃ/ in tongue twisters and statistical significance and effect size as measured by Wilcoxon signed ranks (*Z*) and Cohen's *d*.

Group	Number of target sounds produced	Pretest score	Posttest score	Development	*Z*	*p*	*D*
1 (tongue twisters)	130	85 (65%)	112 (86%)	+27 (+21%-points)	−4.217	.000***	0.40
2 (authentic sentences)	130	50 (38%)	68 (52%)	+18 (+14%-points)	−2.449	.014*	0.22

***p < .001.
**p < .05.
*p < .01.

TABLE 6 Group-wise development in the production of Swedish /ʉ/ and /ʃ/ in authentic sentences and statistical significance and effect size as measured by Wilcoxon signed ranks (*Z*) and Cohen's *d*.

Group	Number of target sounds produced	Pretest score	Posttest score	Development	*Z*	*p*	*D*
1 (tongue twisters)	230	119 (52%)	183 (80%)	+64 (+28%-points)	−7.000	.000***	0.52
2 (authentic sentences)	210	86 (41%)	117 (56%)	+31 (+15%-points)	−3.906	.000***	0.28

***p < .001.
**p < .05.
*p < .01.

tongue twisters (+28%-points vs. +21%-points), reaching medium effect. Group 2 made similar, modest developments regardless of the material type.

5 | DISCUSSION

Several previous publications on tongue twisters have promoted the technique by referring to learners finding it enjoyable (e.g., Masfirotul Uyun & Kumalarini, 2014) and motivating (e.g., Mu'in et al., 2017; Zhang, 2014). In addition, Sitoresmi (2016) claims that tongue twisters can have a positive effect on the atmosphere in class. All these viewpoints are supported by the present study; the majority of the learners enjoyed tongue twisters, found them motivating and good for the atmosphere. Similarly to Mu'in et al. (2017), many of the learners in our experiment reported that tongue twisters helped them improve their pronunciation at the level of sounds, and that the training even affected their overall speech fluency positively.

As pointed out by Hancock (2006), tongue twisters can be criticised for not resembling real-life communication. Such criticism did not appear in our questionnaire directly, but some learners would have appreciated training with authentic, everyday sentences, either instead of tongue twisters or in addition to them. This may be linked to the artificial nature of tongue twisters but to also frustration or boredom. Zhang (2014) points out that students will lose interest in tongue twisters, if they are used excessively. This is an aspect that we considered already when designing the teaching experiment. Tongue-twister training was limited to 15 min per session. Still, continued work on tongue twisters in pairs after repeating them after the teacher was mentioned as unnecessary in the questionnaire. This may be a sign of losing interest and craving for a change. Based on our experiment, teachers may want to consider using tongue twisters in more moderate time slots, according to the learners' level of interest and concentration spans. Based on the present study, however, we cannot take a stand on how much practice on tongue twisters will have an impact. It is likely that the effectiveness of this technique is based on repetition, and cutting down on time spent on the training will probably have a negative effect on the learning results. The present study showed that training with tongue twisters for 6×15 min can lead to improvements.

In the 6×15 min of training, the number of produced target sounds is higher when using tongue twisters than when training with authentic sentences, as target sounds occur more frequently in tongue twisters. The essence of tongue twisters seems to be in effective repetition. An intriguing question is whether the same learning results would have been achievable with the same amount of target sounds produced in authentic sentences. We acknowledge that this may be possible, and find it an interesting issue to be addressed in future research. Nevertheless, tongue twisters would outdo authentic sentences in efficiency, as producing the same number of target sounds in authentic sentences would take considerably more time. The present experiment simulated a very likely scenario in a language class, where a teacher decides to spend a 15-min slot for pronunciation. In such circumstances, choosing tongue twisters over authentic sentences will result in a greater number of produced target sounds.

In light of the present study, concerns expressed by Derwing and Munro (2015, p. 106) and Nation and Newton (2009, p. 82) about tongue twisters being too difficult are not completely unnecessary: a couple of learners did find tongue-twister training too difficult, hence frustrating. Even though these learners were a minority in the present study, it cannot be disregarded that some learners may struggle with tongue twisters—especially if they are the most challenging kind and introduced abruptly in the classroom. Of course, learners' overall

proficiency in the target language must be taken into consideration. To avoid frustration, our approach could be followed: introducing and practising on simplified versions before moving on to full versions.

As for the learning results of the present teaching experiment, the findings were clear: both training with tongue twisters and authentic sentences can facilitate development in the pronunciation of Swedish /ʉ/ and /ʃ/ by L1 Finnish learners, but training with tongue twisters was more efficient. However, if Hattie (2009) is followed and 0.4 considered a threshold effect measured by Cohen's *d,* all group comparisons presented in this paper leave Group 2 (authentic sentences) below the threshold, whereas Group 1 (tongue twisters) is above. In other words, the learning results achieved by training with authentic sentences in our experiment can be questioned, but the achievements of the tongue-twister group are unquestionable. What is more, this study showed that learners who trained with tongue twisters were able to transfer the learnt skills to other contexts: the learners also developed their pronunciation in authentic sentences.

As for the limitations of the present study, the pretest revealed that Group 2 (authentic sentences) had more challenges in the beginning. In addition, some unevenness was detected in the amount of practice outside of class, as indicated by the learners in the questionnaire. Ideally, the two groups would have scored equally in the pretest and practised the same amount outside of class. As they did not, one could argue that Group 2 participants had lower learning ability or that they may have been less motivated to learn in the first place. This is possible, and it needs to be considered that these factors weaken the strength of evidence obtained in the present study. As such, our results interestingly reveal that pretest scores do not predict learning results. Learners with low scores in the pre-test are not doomed to bad learning results, but some develop well (e.g., #014 in Group 1 and #023 Group 2) while others do not (e.g., #027 and #028 Group 2). Another interesting question is whether the technique possibly had an effect on free-time practice amount. Was tongue-twister training so motivating that learners gladly spent time working on them also outside of class, whereas the authentic sentences did not attract learners in their free time? Still, the issues of learning ability and motivation could not be controlled for in the present study, and remain a question mark and a challenge for future teaching experiments.

Narrow scope and small number of participants are further limitations of the present study. We would also like to emphasise that the participants were unique, because they were university students of the target language in a context, where multilingualism and language studies are promoted and appreciated. Hence, the participants may not compare with other learner groups and other types of contexts. In addition, pronunciation development was analysed from two sounds in one language. We do not know whether the results are applicable to learning other languages, learning prosody, or even other sounds. Further, mapping learners' views on tongue twisters would have benefitted from a broader survey.

Although we feel like the pronunciation teaching classic that was dealt with in this paper passed our test and can be declared a technique that has research-based potential for L2 pronunciation learning, more research on this technique, as well as other pronunciation teaching techniques, is required. Research could be extended to concern other participant groups (e.g., beginner-stage learners) and contexts (e.g., immigrant situations), as well as to other L1s and L2s and a wider variety of target sounds. A more in-depth surveying—for example through interviews—could help to better understand *why* tongue twisters are enjoyable, motivating, or good for the atmosphere in class. Finally, a delayed posttest could shed light on whether the learning results are long-term or only temporary.

6 | CONCLUSION

The aim of the present study was to gain research-based knowledge about tongue twisters as a pronunciation teaching and learning technique. We wanted to find out, how learners view this pronunciation teaching classic, and whether it can facilitate L2 pronunciation learning better than training with authentic sentences. Our findings are based on a carefully designed teaching experiment, in which two material types—tongue twisters and authentic sentences—were compared to each other. Results were positive as for the group that trained with tongue twisters. The majority of the learners found the technique fun, motivating, good for the atmosphere in class, and helpful as for improving their pronunciation. On a group level, learners' pronunciation of the target sounds improved significantly during a 3-week training period, whereas the comparison group's development was weaker.

This study suggests that tongue twisters have not become a pronunciation-teaching classic for no reason. If a teacher is interested in this technique and their learners have a positive attitude toward it, using it as a part of versatile, explicit pronunciation teaching can be recommended. To avoid frustration and boredom, simplified versions or easy tongue twisters could be used in the beginning, and the time spent on tongue-twister training may be better kept at a maximum of 15 min at a time. Importance of varied pronunciation training came across in the study; tongue twisters were enjoyable because of their novelty. The present study gives no reason for teachers not to take up tongue twisters, especially if they have learners who are not yet familiar with this classic.

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APPENDIX: Materials used in training and testing (with English translations)

Tongue twisters used in training

1. Göken jublade i den ljusa juninatten. *The cuckoo rejoiced in the bright June night.*
2. Göken jublade glad i den ljusa och ljuvligt ljumma juninatten. *The cuckoo rejoiced joyfully in the bright and delightfully mild June night.*
3. Sju hekto skinka skickas till Skepparegatan. *Seven hectograms of ham should be sent to Captain Street.*
4. Sju hekto skinka, skäres i skivor, skickas till Skepparegatan 77, Sjögren på skylten. *Seven hectograms of ham should be sliced and sent to Captain Street 77, sign says Sjögren.*
5. Knut satt på en stubbe och knöt en knut. *Knut sat on a stump and tied a knot.*
6. Knut satt på en stubbe och knöt en knut. När Knut knöt knuten började hunden gny. *Knut sat on a stump and tied a knot. When Knut tied the knot a dog started to whimper.*
7. Jag sköter om en sjuk giraff. *I am taking care of a sick giraffe.*
8. Jag sköter om en sjuk giraff som kallas Chefen. *I am taking care of a sick giraffe called the Boss.*
9. Sture kastade spjut i pyjamas. *Sture threw javelin in his pyjamas.*
10. Sture kastade spjut i pyjamas men Stures spjut spräckte pyjamasen i tu. *Sture threw javelin in his pyjamas, but Sture's javelin tore the pyjamas in two.*
11. Kerstin Sjöholm har en skällande schäfer. *Kerstin Sjöholm has a barking German Shephard.*
12. Kerstin Sjöholm har en skällande schäfer som tycker om att duscha. *Kerstin Sjöholm has a barking German Shephard that likes to shower.*

Tongue twisters used in testing

1. Gumman gav Julia en gul gullhöna. *The old woman gave Julia a yellow ladybird.*
2. Bagare Bullen bakade bruna fula bullar. *Baker Bullen baked brown ugly buns.*
3. Sju sköna sköterskor. *Seven beautiful nurses.*
4. Sköterskor sköljde sina ben i sjön. *Nurses rinsed their legs in the lake.*

Authentic sentences used in training

1. Han köpte lite frukostkorv. *He bought some breakfast sausages.*
2. Vi hade kul igår. *Vi had fun yesterday.*
3. Vi hade ingen chans att lyckas. *We had no chance to succeed.*
4. Hon arbetar på ett sjukhus. *She works in a hospital.*
5. Tack så mycket – det var schysst av dig! *Thank you so much – it was nice of you!*
6. Tycker du om choklad? *Do you like chocolate?*
7. Vi ska åka till Grekland i juli. *We are travelling to Greece in July.*
8. Utbildningen var sju år lång. *The training lasted seven years.*
9. Han jobbar som civilingenjör på ABB. *He works as an engineer at ABB.*
10. De målade huset gult i somras. *They painted the house yellow last summer.*
11. Jag är sjukt bra på grammatik. *I am crazy good at grammar.*
12. Han bor i Sjundeå. *He lives in Sjundeå.*
13. Solen skiner mycket fint idag! *The sun shines very beautifully today!*
14. Vilken otur jag hade! Jag blev sjuk och togs in på ett sjukhus. *I had such bad luck! I got sick and was taken to a hospital.*
15. Jag är lärare och min fru är sköterska. *I am a teacher and my wife is a nurse.*
16. Vet du vad klockan är? *Do you know what time it is?*
17. Tusen tack – jag ska bjuda tillbaka någon gång! *Thank you so much – next time is on me!*

18. Det skulle vara skönt med lite semester nu. *I could use a little holiday now.*
19. Förra gången var jag ledig under julen. *Last time I took some time off was before Christmas.*
20. Jag tror att han heter Tore eller Ture. *I think he is called Tore or Ture.*
21. Han jobbar som sjukgymnast inom äldrevården, tror jag. *He works as a physiotherapist with the elderly, I think.*
22. Stugan ligger vid en sjö. *The cottage is by the lake.*

Authentic sentences used in testing

1. Vi hade ingen chans i matchen. *We had no chance in the game.*
2. Titta vilken ful hund! *Look, what an ugly dog!*
3. Han är spjutkastare. *He is a javelin thrower.*
4. Tycker du om att åka skidor? *Do you like to ski?*
5. Det var en chock, sa han. *That was a shock, he said.*
6. Ska vi åka ut ikväll? *Shall we go out tonight?*
7. Jag köpte en skiva igår. *I bought a record yesterday.*
8. Han är kul, tycker jag. *I think he is cool.*
9. Sture är chef i firman. *Sture is the firm's boss.*
10. Vi ska till stugan imorgon. *We are going to the cottage tomorrow.*
11. Bilen var gul, vill jag minnas. *I recall the car was yellow.*
12. Ska ni fira jul tillsammans? *Are you going to celebrate Christmas together?*
13. Han köpte en brun matta sa pappa. *Dad says he bought a brown rug.*
14. Det var skönt att prata med honom! *It was wonderful to talk to him!*
15. Är du bra på schack? *Are you good at chess?*
16. Har du träffat min fru tidigare? *Have you met my wife before?*
17. Någon sköt på stan igår. *Somebody fired a gun yesterday in the city.*
18. Tycker du om bruna bönor? *Do you like brown beans?*
19. Solen skiner väldigt fint idag. *The sun shines really beautifully today.*
20. Han är en stjärna! *He is a star!*