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Genealogy of Novice Teachers' Beliefs about Pronunciation Instruction: A Complex Systems Approach

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Abstract

There is a substantial body of studies investigating teachers' beliefs about pronunciation. However, this line of research has rarely examined teachers' beliefs as a complex system. To fill this gap, the present study aims to shed light on the genealogy of teachers' beliefs about pronunciation instruction from the perspective of complexity theory. To this end, two EFL teachers who taught English at a private institute were asked to participate in this study. Data were collected using semi-structured interviews and narratives. The findings indicated that the teachers recognized the importance of pronunciation instruction for improving students' listening skills and knowledge of vocabulary and manifested aspiration for native-like pronunciation. However, their lack of self-confidence and insufficient pronunciation pedagogical knowledge base were reported to be major challenges of pronunciation instruction, which they attributed to teacher training courses among other factors. In addition, teachers' beliefs about pronunciation, learners, learning pronunciation, teaching pronunciation, teachers, and curriculum were shown to co-exist and interact in a nonlinear manner, suggesting the complex, dynamic, co-adapted, and contextual-driven nature of teachers' belief systems. In light of these findings, teacher education programs are advised to help teachers reappraise their preference for native speakerism and give pronunciation more prominence by introducing a wide range of strategies for teaching it.

Keywords: *Teacher Cognition, Teacher Beliefs, Pronunciation Instruction, Complexity Theory*

Introduction

Our understanding of the field of teacher education partly comes from research on teacher cognition, which is defined as "understanding ... how becoming, being, and developing as a teacher is shaped by (and in turn shapes) what teachers (individually and collectively) think and feel about all aspects of their work" (Borg, 2019, p. 4). The importance of teacher cognition is well-documented in the literature as researchers have investigated it from various perspectives as diverse as beliefs about content knowledge such as grammar (e.g., Chung &

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Fisher, 2022; Sato & Oyanedel, 2019), assessment (e.g., Narathakoon et al., 2020; Widiastuti et al., 2020), technology (e.g., Habibi et al., 2023; Garib, 2022), English as an international language (e.g., Christou et al., 2022; Tajeddin et al., 2020), and pedagogical decisions (e.g., Ji et al., 2022; Munandar & Newton, 2021). Indeed, despite methodological and theoretical differences, this body of research highlights that an increased understanding of teacher cognition can paint a more vivid picture of teacher learning, teaching practices, the role of teachers and learners, student learning, and effective pedagogy (Li, 2020).

From the 1970s onward, teacher education research has focused on teachers as decision-makers whose instructional practices are based on a collection of cognitions (Borg, 2015, 2019; Kubanyiova & Feryok, 2015; Li, 2020). As a subconstruct of teacher cognition, teachers' beliefs are assumed to exert a significant influence on their classroom practices (e.g., Farrell, 2015; Wang et al., 2020) and pedagogical reasoning (e.g., Asghari et al., 2021; Blackley et al., 2021; Tajeddin & Soleimani, 2022). Hence, much of the work on language teachers' beliefs has examined the relationship between teachers' stated beliefs and classroom practices (e.g., Ghavamnia, 2020; Mao & Crosthwaite, 2019; Mulyah & Aminatun, 2020; Garcia-Ponce & Tagg, 2020; Widiastuti et al., 2020; Yu et al., 2020). Although these studies have shed light on language teachers' belief-practice congruency, given the complex relationship between teachers' beliefs and context, as Borg (2006) puts it, "the study of cognitions and practices in isolation of the contexts in which they occur will inevitably, therefore, provide partial, if not flawed, characterizations of teachers and teaching" (p. 275). An outgrowth of this restricted understanding of teachers' beliefs was an advocacy for a new line of research that could account for the systematicity, complexity, dynamicity, and contextual features of teachers' beliefs (Feryok, 2010; Zheng, 2015). The present study responds to this call by drawing on complexity theory (Larsen-Freeman, 2017, 2020) to explore language teachers' beliefs about pronunciation instruction. In doing so, this study will not only contribute to the existing literature about language teachers' cognitions about pronunciation, it will also shed light on how the interactions among the elements of teachers' beliefs, practices, and contexts account for the complex and diverse nature of teachers' mental lives and practices.

Literature Review

Teacher Beliefs

Cognition, defined as "the unobservable cognitive dimension of teaching" (Borg, 2003, p. 81), is an umbrella term for teachers' knowledge, beliefs, and assumptions (Karimi & Norouzi, 2019). Among these subconstructs, teachers' beliefs are assumed to exert a significant influence on their classroom practices as for their filtering effect on teachers' decisions (Borg, 2019). A large body of research on the teacher knowledge base has been devoted to teacher cognition and beliefs (e.g., Borg, 2015, 2019; Borg & Sanchez, 2020; Johnson, 2018; Karimi & Norouzi, 2017; Kubanyiova & Feryok, 2015; Li, 2017, 2020). As a major subconstruct of cognition, beliefs are reported to act as a lens through which teachers make decisions (Borg, 2019). Given the importance attached to beliefs, researchers have examined this construct from various perspectives ranging from correspondence between beliefs and practices (e.g., Basturkmen, 2012; Borg, 2018; Buehl & Beck, 2015; Widiastuti et al., 2020) to the impact or no impact of teacher education programs on beliefs (e.g., Clarke, 2008; Lorenz et al., 2021; Nazari, 2020). The first line of research has reported inconsistent findings about the

correspondence between teachers' beliefs and their practices, attributing the discrepancy to various personal and contextual factors such as curriculum (Yu et al., 2020), excess workload (Mao & Crosthwaite, 2019), and lack of training (Wang et al., 2020). In one study, for example, Wang et al. (2020) collected data from 136 teachers to investigate the congruency between teachers' beliefs about writing assessment and their practices. They found out that although teachers perceived assessment for learning to be more significant than assessment of learning, they practiced the reverse in action. A wide range of factors were found to account for this discrepancy such as students' attitudes, school factors, assessment training, assessment culture, and teaching experience. In another study conducted in Turkey, Yüksel et al. (2021) used observation, stimulated recall interview, and a task to examine twenty teachers' beliefs about oral corrective feedback. The results revealed that the dynamics of class discussions, learners, classroom management, and type of activity led to the incongruency between beliefs and practices.

Studies examining the effect of teacher education programs on beliefs have also led to inconsistent findings. Some studies have found no significant relationship between teachers' beliefs and teacher education programs (e.g., Lorenz et al., 2021). However, numerous studies support the influence of teacher education programs on teachers' beliefs (e.g., Clarke, 2008; Nazari & Xodabande, 2022; Van Ha & Murray, 2021). In the study by Van Ha and Murray (2021), for instance, 10 EFL teachers participated in a professional development program that comprised one workshop and experiential and reflective activities. Data were collected using interviews and written reflections. Van Ha and Murray reported changes in teachers' beliefs about corrective feedback regarding its types, timing, sources, and targets. Nazari and Xodabande (2022) also reported the effectiveness of a professional development initiative on language teachers' practices and beliefs about mobile phone usage. In this study, data were gathered via observations, interviews, and reflections. The results were indicative of teachers' increased educational exploitability of mobile phones and their associated beliefs. In addition, teachers were found to utilize mobile phones directly and indirectly in their classes.

Research on Teachers' Beliefs about Pronunciation

Literature on teachers' beliefs/cognitions about listening (e.g., Emerick, 2019; Graham et al., 2014; Nazari, 2020), grammar (e.g., Farrell & Lim, 2005; Hassan et al., 2022; Nishimuro & Borg, 2013; Watson, 2015), vocabulary (e.g., Bergström et al., 2022; Gao & Ma, 2011; Lim, 2016; Macalister, 2012), and writing (e.g., Karaca & Uysal, 2021; Mao & Crosthwaite, 2019; Yu et al., 2020) is relatively well documented. Comparatively, there have been fewer studies investigating teachers' beliefs about pronunciation (Nguyen et al., 2021), though past research has recognized pronunciation as a vital factor for mutual intelligibility in oral communication (e.g., Bai & Yuan, 2019; Baker, 2014; Buss, 2016; Couper, 2017; Nagle et al., 2018; Thomson & Derwing, 2015).

In one study, Bai and Yuan (2019) examined the beliefs of 16 non-native English teachers and their instructional practices. They found that although all teachers appreciated the significance of teaching pronunciation, their lack of self-confidence and training and their non-native status led to discrepancies between their beliefs and practices. In the study by Nguyen and Newton (2020), observations, interviews, and video recordings were used to investigate six teachers' beliefs and pronunciation practices. The study showed that the instruction of

pronunciation was not preplanned and usually took place in the form of corrective feedback. In 2021, Nguyen et al. conducted another qualitative study to examine teachers' and students' beliefs about pronunciation in tertiary EFL education in Vietnam. The results showed that both teachers and students considered communicative pronunciation teaching as an important component. In another study, Georgiou (2019) used an online survey to examine the beliefs, practices, and challenges of three groups of teachers. While all the groups reported lack of training and time constraints as major challenges, they differed in their views about pronunciation, with the younger group attaching more importance to other skills. As for teaching practices, they were almost similar. Focusing on the beliefs of pre-service and in-service teachers about pronunciation teaching, Tsunemoto and Trofimovich (2023) investigated the relationship between teachers' beliefs and their experiences. An online questionnaire and speaking performance rating were used to collect data. In this study, in-service teachers held stronger beliefs about L2 pronunciation instruction. The researchers concluded that teaching experiences and beliefs can be influential factors in shaping teachers' pronunciation instruction.

Overall, this line of research, despite relative scarcity, has documented the significance of exploring language teachers' cognitions about pronunciation. However, given the growing recognition of beliefs as a complex system composed of "substructures of beliefs, practices, and contexts" (Zheng, 2015, p. 13), further research is needed to explore other contextual and personal factors that affect teachers' beliefs and practices. Such research can lead to promising results if it is guided by a more comprehensive framework that can account for and provide a more nuanced understanding of the intricate interactions among the factors. In other words, it is essential to use a conceptual framework that embraces the complexity and dynamicity of teachers' beliefs. Such a multidimensional investigation of teachers' beliefs can inform pronunciation instruction courses and deepen our understanding of how the evolving classroom dynamics shape and reshape teachers' beliefs and practices.

Complexity Theory

In 1997, Larsen-Freeman introduced complexity theory into the field of applied linguistics. It is a theoretical framework that sheds light on systems behavior. Seen as heterogenous and dynamic, complex systems consist of various agents with initial conditions playing a significant role in the system pattern. In other words, trivial changes in initial conditions can bring about unpredictable changes in later conditions, which implies that changes in complex systems are not linear (Larsen-Freeman, 2017, 2020). As for the relationship between the components of a system, it is argued that there exists a reciprocal relationship between the components in that they interact with each other, thereby causing changes in the system. Another defining feature of complex systems is that they are contextualized as they interact with other systems, as well. This interaction with other systems enables complex systems to be influenced by and respond to changes in other systems. The last defining characteristic of complex systems is that they are self-organizing, capable of bringing order to the system despite all the unpredictable changes.

This theory has inspired a number of applied linguistics researchers to examine the features of complex systems in a wide range of areas such as L2 syntactic structures (e.g., Evans & Larsen-Freeman; 2020), writing instruction (e.g., Abdelhalim, 2023), and teacher educators'

expertise (e.g., Yuan & Yang, 2022), among others. Not surprisingly, this theory has also attracted the attention of teacher cognition researchers (e.g., Feryok, 2010; Rahman & Mehar Singh, 2021; Zheng, 2013). Studies in this line of research have documented the relevance of this theory for exploring teachers' beliefs as a complex system. More specifically, several factors including teachers' prior learning experiences, contextual factors, training courses, and practices (Karimi & Norouzi, 2017) connect and interact to shape teachers' belief systems. However, as Feryok (2010) argued, "new cognitions can add to, alter, and replace cognitions" (p. 274). This dynamicity of language teachers' cognition development results in unpredictable changes that are not linear (Rahman & Singh, 2021). These beliefs are contextualized and co-adaptive (Zheng, 2015) in the sense that different types or components of beliefs act as an ecosystem that is shaped by and shapes other systems (Larsen-Freeman & Cameron, 2008). In particular, co-adaptation, defined as "the process in which a system adjusts itself in response to changes in its environment" (Larsen-Freeman & Cameron, 2008, p. 33), indicates how teachers alter their cognitions as a result of their awareness of changes in learners' needs and their environment.

Inspired by this strand of research and considering the scarcity of studies on teachers' beliefs about pronunciation, the present study aimed to examine the trajectory of language teachers' beliefs about pronunciation instruction using the conceptual framework of complexity theory. More specifically, the present study investigates the following research questions:

RQ1: What are teachers' beliefs about pronunciation instruction?

RQ2: How is the teachers' trajectory of pronunciation beliefs shaped?

Method

Participants

To gain an in-depth understanding of the trajectory of teachers' beliefs about pronunciation, a case study approach was used. Through a convenience sampling procedure, two Iranian EFL teachers were selected to participate in this study. To remain anonymous, the teachers self-selected pseudonyms. The first teacher, Maryam, was 23 years old and held a B.A. degree in English Translation. The second teacher, Sara, was 28 years old and held a B.A. degree in English Literature. Both teachers had four years of teaching experience and taught at a private institute where they taught general English courses at various proficiency levels. The main methodology at the institute was communicative language teaching; however, pronunciation received scant attention in the institute's teacher training course (TTC).

Data Source

Before the study, informed consent was obtained from the two teachers and then in-depth semi-structured interviews were conducted with them to investigate their beliefs about pronunciation instruction. The interview questions focused on teachers' views about the importance of pronunciation and their teaching practices. The core questions were as follows: (a) Is pronunciation an important (sub)skill to be learned by students? Why?; (b) Do you teach pronunciation in your classes?; (c) How do you teach pronunciation?; (d) Have your views about the importance of pronunciation changed? If yes, why/how?; (e) Have you changed the way you teach pronunciation? If yes, why?; (f) Has your experience as a learner had any effects

on your views about pronunciation?; and (g) What other factors have influenced your views about pronunciation and its teaching? Lasting for about 50 minutes each, the interviews were conducted in Persian, the participants' native language. All the interviews were audio-recorded and then transcribed. The transcripts of interviews were then sent to the participants for member checking, as suggested in the literature (Mertens, 2010). In addition to interviews, teachers were asked to narrate their beliefs about pronunciation instruction and how different factors influenced their beliefs in order to capture a more comprehensive account of their belief trajectories.

Data Analysis

The content of the interview transcripts and teachers' narratives were analyzed in several steps (Braun & Clarke, 2006). After reading the transcripts carefully, initial codes such as *accent*, *training*, and *lack of confidence* were generated. Then codes sharing similar concepts were collated into the same sub-themes. For instance, codes such as *native-like accent*, *British accent*, and *American accent* were categorized into a sub-theme labeled as *native speakerness*, and codes labeled as *knowledge of vocabulary* and *listening ability* were combined to form another sub-theme called *communicative competence*. Once all the codes were assigned to their relevant sub-themes, the sub-themes referring to a similar concept were merged to form a major theme. For example, *learners' needs*, *expectations*, and *attitudes* were grouped into the theme of *beliefs about learners*. The findings were also rechecked iteratively to identify the factors that led to the emergence of changes in participants' belief systems. Finally, to analyze data through the lens of complexity theory, three broad categories of complexity, dynamicity, and contextualization were used as templates to analyze and discuss the findings.

Results

This study sought to explore language teachers' beliefs about pronunciation instruction and how such beliefs are shaped and reshaped. In what follows, the most representative responses relevant to each theme are quoted. The written narratives are referred to as "WN" while the interviews are referred to as "Int".

Teachers' Beliefs about Pronunciation Instruction

The first research question concerned teachers' beliefs about pronunciation instruction and content analysis yielded seven categories in this regard.

The first theme, *beliefs about pronunciation*, represents teachers' views about pronunciation and its features and the benefits of teaching pronunciation. Sara, for instance, highlighted that teaching pronunciation can help learners improve their knowledge of vocabulary:

Students have different learning styles, so it is better to use various strategies in classes. Sometimes it is much easier to help students remember words by coding them based on their sound patterns. (Sara, Int)

Looking at it from a different perspective, Maryam emphasized that teachers should teach the correct pronunciation of words because she believed that teaching pronunciation can facilitate students' communicative competence by improving their listening skill:

Most students are good at reading texts, but if the same content is presented to them orally, they cannot communicate appropriately...Simply because they don't know the pronunciation of some words. (Maryam, Int)

Maryam believed that a major decision a teacher has to make is to decide what to teach. She maintained that it is neither realistic nor logical to attend to all features of pronunciation in a general English course:

At lower levels, I usually focus on word stress and syllables, but give feedback on sentence stress and rhythm in higher classes. (Maryam, Int)

The second theme is labeled as *learner-related beliefs*. This theme deals with teachers' beliefs about learners' expectations, needs, attitudes, and feelings. Sara expressed how she gradually de-emphasized pronunciation when she realized that students had attended the English class to do well on their school exams:

During the first months of my teaching experience, I did my best to correct students' pronunciation problems. I asked them to listen to and repeat the audio tracks. But once one of my students complained about it and asked me to spend more time on grammar and vocabulary which are tested at school exams. (Sara, WN)

On several occasions, both teachers argued that, apart from educational purposes, helping students improve their pronunciation can heighten their self-confidence.

I always see that students who speak with a good accent are more willing to participate in classroom discussions. This discourages some students from speaking in front of others because they feel ashamed of their accents. (Maryam, WN)

As the third theme, *teachers-related beliefs* embodies teachers' views about themselves and the competencies they believe teachers must have to teach pronunciation. Sara, for instance, explains that language teachers are supposed to have a good command of English pronunciation:

Teachers are role models for students. They are a source of motivation. Therefore, they must have a native-like accent; otherwise, they won't be accepted by their students as knowledgeable teachers. (Sara, WN)

The fourth theme that emerged from data analysis relates to teachers' beliefs about *learning pronunciation*. This theme involves beliefs about how pronunciation can be learned. Sara

maintains that she did not pursue her desire for developing native-like accent when she realized the difficulty in mastering it:

I found it really difficult to speak like native speakers. No matter how hard I tried to listen to audio tracks on a daily basis and imitate what I heard, others could easily detect my Persian accent. (Sara, Int)

Beliefs about teaching pronunciation was the fifth theme, representing teachers' beliefs about techniques and strategies they used in their classes. In what follows, Sara admits that her teaching strategy is not appropriate.

To be honest, when students make mistakes, the only thing I do is to ask them to repeat the word after me. (Sara, WN)

Making a similar point, Maryam criticizes her own teaching strategies:

I think the way I teach pronunciation is really boring. Just repetition drills which focus on suprasegmental features. When it comes to grammar, listening, etc., I know what to do. I mean that we have pre-task, while task, and post-task with different techniques for each phase. (Maryam, Int)

The sixth theme, *curriculum*, represented teachers' beliefs about course goals, materials, and time constraints. Although both teachers underscored pronunciation instruction, they were reluctant to allocate as much time for pronunciation as they were concerned about covering the course material. For instance, in the extract below, Maryam prioritizes other components such as grammar and vocabulary as she considers them to be more realistic goals.

I'm not saying that it is impossible to teach pronunciation. My point is that if I focus on pronunciation every session, I cannot cover the whole book. (Maryam, Int)

The last theme that emerged from the data was *training programs*. This theme dealt with teachers' beliefs about the modules of TTC and their experiences in this regard. For instance, Maryam describes how lack of the pedagogical knowledge base held her back from teaching pronunciation in her classes and criticizes the TTC she had attended:

I was shocked. The teacher educators were mainly concerned with grammar, speaking, reading, listening, and vocabulary. They taught several strategies for teaching those skills, but only a few for pronunciation! (Maryam, Int)

Genealogy of Teachers' Beliefs about Pronunciation Instruction

The second research question aimed to unravel the genealogy of teachers' beliefs about pronunciation. To provide a clear picture of how teachers' beliefs evolved over time, Maryam and Sara's accounts of their beliefs are presented in two separate sections.

The Trajectory of Sara's Pronunciation Beliefs

Sara's initial beliefs about pronunciation were formed when she enrolled in an English class and had a teacher with a great British accent:

I still remember it vividly. I was impressed by her accent. She spoke like British people.

She further said that she disregarded pronunciation for a while when she did not see any signs of improvement in her pronunciation:

I got tired of repeating words. I didn't know the stress of all words and I got tired of looking them up in my dictionary. Maybe if I had started sooner, I could pick up the accent.

However, she explained that when she was an intermediate-level learner, one of her teachers' great accent invigorated her pursuit of constructing an ideal self with a native-like accent:

I was really happy. I had a class with the same teacher again. She spoke perfectly as if she were a native speaker. I wish I could speak like her.

Sara expressed that during the first months of her teaching experience, she used to have a lot of repetition drills in her classes, but when she attended a TTC, she got familiar with the concept of intelligibility.

My teacher educator pointed out that non-native speakers use English to communicate with other people and if you, as teachers, help them make themselves understood and understand others, you accomplish your mission.

As a result of attending the TTC, as she stated, she decreased the use of pronunciation drills and extra activities and learned to adjust her beliefs to the needs of her students:

During the first months of my teaching experience, I did my best to correct students' pronunciation problems. I asked them to listen to and repeat the audio tracks. But soon I realized they needed help with grammar because of their exams.

However, she admitted that even now she tends to give better scores to those students who have a native-like accent.

The Trajectory of Maryam's Pronunciation Beliefs

Maryam's account of her beliefs about pronunciation reveals that she also changed her beliefs during her apprenticeship of observation and teaching experience due to various internal and external reasons. As Maryam described, she primarily believed in a native-like accent,

especially British English, and always asked students to listen to and repeat the files she shared with them. However, her experience as a learner caused her to change her mind:

I used to equate English proficiency with a native-like accent. But when I observed how frustrated my classmates would become as a result of my teacher's emphasis on correct pronunciation, I changed my mind because my classmates could communicate very well despite their weak accents.

Dissatisfied with her pronunciation, Maryam attributed her failure to develop a native-like accent partly to her teachers who ignored pronunciation instruction. Having this experience, she enrolled in a workshop to improve her pedagogical knowledge base.

I could have a better accent if they cared about pronunciation. It's a tricky situation. In my classes, I always wonder what to do. I don't want to create the same experience for my students.

She admitted that she had attended the course to learn how to improve her pronunciation. She described how she created a feared image of herself as a teacher with weak pronunciation simply because of her teacher:

I remember when I was a student, my classmates made fun of our English teacher because of her terrible accent. Although she had a perfect command of English vocabulary and grammar, she was not accepted as the authority in class.

She believed that after the TTC she was more sensitive to students' needs and interests. For instance, she described how she gathered a pool of minimal pairs only because they were more interesting for students or reduced her feedback to major pronunciation problems to relieve their stress.

Discussion

The first aim of this study was to investigate teachers' beliefs about pronunciation instruction. In general, the findings showed that L2 pronunciation is embedded within a larger system (which involves several subsystems) and itself consists of multiple subsystems. More specifically, it was found that teachers viewed L2 pronunciation as a complex system that consists of multiple subsystems such as listening skills, knowledge of phonetics and phonology, articulatory skills, and so on. Although they held strong beliefs about teaching pronunciation, confirming the previous studies that consider pronunciation as an important subskill to be practiced in English classes (Jones, 2018) as it improves the listening skill (Kissling, 2018), this subskill was not perceived to be as important as other subskills and skills. More specifically, teachers believed that due to time constraints, focusing on other subskills would have better outcomes. This is in line with Bai and Yuan's study (2019) in which teaching grammar and vocabulary was preferred over pronunciation due to exams and lack of time. This finding confirms that beliefs about L2 pronunciation are interconnected with and embedded within other systems. In other words, external factors such as time, curriculum, and educational

policies affect teachers' beliefs and accordingly their practices. It also indicates that teachers' instructional practices vary in line with their perceptions of educational contexts, pointing to the contextual variability of L2 pronunciation. Teachers' beliefs about themselves are also interconnected with their beliefs about pronunciation instruction. Consistent with previous research (e.g., Couper, 2017), teachers who lacked sufficient confidence to teach pronunciation, for example, did not take pronunciation instruction seriously in their classes. In line with previous studies, these teachers confined pronunciation instruction to giving feedback (Couper, 2017) or drills and repetitions (Georgiou, 2019). Therefore, their awareness of their lack of self-confidence and insufficient pedagogical strategies fed back into the system. This finding implies the need to revisit the content of TTCs, particularly pronunciation instruction pedagogy. A further finding of this study showed that teachers' beliefs and practices about pronunciation interacted with their beliefs about learners' feelings, expectations, and so on, resulting in the class time being more devoted to skills and practices that students were more likely to develop in the short run. That is why most teachers confined pronunciation instruction to the extent that intelligibility was achieved, which is recognized as an appropriate goal for pronunciation instruction (Couper, 2017). That native-like competency cannot be an appropriate goal for second language learners is also supported in the study conducted by Buss (2015) where he concluded that "intelligibility and comprehensibility are better goals for pronunciation teaching than foreign accent reduction" (p. 15).

Complexity and Heterogeneity

As shown by the results, teachers hold beliefs about different areas such as pronunciation, learners, teachers, teaching pronunciation, learning pronunciation, TTC, curriculum, and prior learning experience. However, as Feryok (2010) pointed out, heterogeneity does not simply mean having beliefs about different issues. This study documents the complexity and heterogeneity of beliefs by showing that beliefs can have different types and components. In other words, teachers hold different beliefs about the same area, though with varying degrees of conviction. For example, Sara, who equated English proficiency with a British accent, changed her mind by accentuating intelligibility after she attended the TTC. This finding reveals that the TTC caused her to accept the belief in intelligibility. However, her later comment "I still preferred a native-like accent and I used to give a better score to those who spoke with a British accent" indicated that her former belief was not eradicated and co-existed with her new belief (It was even stronger in conviction). This implies that teachers' beliefs are not static and alter in response to different situations (Zheng, 2013). It can be also argued that beliefs grounded in their experience as a learner were stronger in conviction. The complexity of teachers' beliefs can be further supported when the interrelatedness of beliefs in different areas is examined (Zheng, 2013). As Maryam maintained, her belief about teaching pronunciation was related to her views about native-like accent. In other words, her insistence on using audio tracks with a British accent and forcing students to repeatedly listen to them might be related to or even stem from her preference for the British accent. In this case, the two beliefs were positively related, but Sara's emphasis on mastering pronunciation, which she believed to have a critical period, co-existed with a conflicting belief in using repetition drills to acquire native-like accent.

Dynamicity and Non-linearity

This study supported the dynamic nature of teachers' beliefs. Growths in teachers' beliefs can count as their dynamicity, which usually results from experience or education (Feryok, 2010). The newly held beliefs can, therefore, change, replace, or add to the existing beliefs, rendering the belief system non-linear and unpredictable (Larsen-Freeman & Cameron, 2008). As stated earlier, Sara came to prioritize intelligibility after she attended the TTC. Accordingly, she confined her teaching practices to teaching the limited pronunciation sections of the books and correcting global pronunciation problems. This new belief, however, did not replace her core belief in the native-like accent because she used drills assumed to be effective in improving native-like accent on some occasions. This finding is in line with previous research (e.g., Burri et al., 2017) that suggests that teacher education programs are not fully effective in changing teachers' beliefs. Unlike Sara, however, the TTC did not have any impact on Maryam's teaching practices, as she narrated, though she accepted that it was more logical to devote more time to other skills and avoid encouraging native-like accent. Although the TTC was successful in creating the belief that pronunciation instruction should be limited to the level of intelligibility, Maryam corrected even minor pronunciation problems, implying that her core belief in native-like accent outweighed her peripheral belief in intelligibility. As such, it is unclear whether experience or education can bring about changes in cognitions and practices or may have no effect (Feryok, 2010). This finding is consistent with previous research which has shown that professional development programs do not always result in the expected outcomes (e.g., Kubanyiova, 2006).

Contextualization and Co-adaptation

The findings of this study point to the co-adaptive nature of teachers' belief systems as they were sensitive to changes in the context including time constraints, students' needs, interests, and competencies. As the data showed, Sara did not devote much time to pronunciation once she realized that her students needed help with other skills. Maryam also tried to provide more examples of minimal pairs when her students expressed interest in this type of activity. Moreover, in an attempt to adapt herself to the changing requirements of the context, Maryam realized that she did not have a sufficient pedagogical knowledge base for teaching pronunciation and hence enrolled in an online workshop about pronunciation instruction. This self-regulatory strategy that Maryam adopted to overcome her self-doubts is indicative of her awareness of the need for a change in her cognitions or practices.

Conclusion

This study demonstrated that teachers' beliefs about pronunciation form a complex system. In general, the participants of this study shared the belief that pronunciation instruction should have a place in English classes. However, the analysis of the genealogy of teachers' beliefs revealed that several belief systems including beliefs about pronunciation, teaching pronunciation, learning pronunciation, learners, teachers, curriculum, and TTCs are influential in the development of beliefs, pointing to the complexity, dynamicity, non-linearity, and the contextually based nature of beliefs about pronunciation.

The findings of this study highlight the need to give priority to pronunciation instruction in teacher education programs. Given that lack of training is likely to cause feelings of lack of

confidence (Bai & Yuan, 2019), it is essential that teacher education programs familiarize teachers with a wide range of approaches and resources in order for them to effectively and confidently teach pronunciation. Furthermore, teacher educators are recommended to boost non-native teachers' confidence by instilling the belief that the aim of pronunciation instruction should be intelligibility rather than native-like pronunciation (Burri, 2015). Moreover, it is not clear whether and to what extent TTCs succeed in changing teachers' practices and beliefs about pronunciation, which might be due to contextual factors (Burri & Baker, 2020). Therefore, if teacher educators "incorporate the context of teaching to a much greater extent in a graduate course on pronunciation pedagogy" (Burri & Baker, 2020, p. 14), TTCs can have more promising results (Levis & Sonsaat, 2019).

The results of this study must be interpreted with caution as data were collected from only two teachers, though using interview data along with narratives helped gather more accurate data. Moreover, retrospective interviews could be conducted to elucidate the dynamicity and complexity of teachers' beliefs about L2 pronunciation. Further studies recruiting teachers with various levels of teaching experience can provide a more comprehensive picture of the complex nature of their beliefs. Future complexity-informed studies can also provide further insights into antecedent factors that are resistant to pronunciation training courses.

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