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Professional Learning Communities: What are they and what do they have to offer TEFL?

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Key words: Professional Learning Communities (PLCs), teaching teams, program development, teacher collaboration, objectives, standards movement, evidence-based education.

Abstract

Professional learning communities (PLCs) have been advocated as a means of restructuring schools to maximize learning in the public education systems of the United States and Canada. This article will discuss the relevance of PLCs within the TEFL community. It will begin with a brief overview of PLCs and some of their common characteristics before outlining some steps TEFL schools and programs would have to take to become PLCs. Next this paper will outline some possible benefits of PLCs for the TEFL field along with some questions and concerns. Finally, some tentative conclusions will be drawn as to what PLCs have to offer the EFL community.

Introduction

The primary focus in the EFL field has tended to be two-fold, language learning and pedagogy, and on the link between the two areas. This can lead to the situation, criticized by Bax (2003), where "methodologically driven" or "language driven" approaches to teaching are advocated regardless of teaching context. Similarly, teacher training programs, where they disregard the teaching context of participants, run the risk of irrelevance when teachers return to their schools. In contrast, Bax (1997) has advocated principles for a context sensitive approach to teacher training programs. However, there is little in EFL literature on an organizational approach to

teacher training, where the engine of professional development is the organization itself, in the way the school or language program facilitates the goal directed exchange of teaching practices. Based in part on Senge's concept of learning organizations (1990), just such an approach has been advocated in the North American public school system: professional learning communities (PLCs). While the context in which PLCs have emerged differs significantly from much of the TEFL field, the organizational principles that underlie the development of professional communities of teachers can be very relevant.

What are PLCs?

PLC proponents forcefully argue the benefits of PLCs in opposition to a status quo as described in studies such as that by Lortie (1975). Lortie offered an "egg carton" analogy, arguing that professional isolation is a defining characteristic of a teacher's workplace. Lortie also argued that teachers typically express doubts about a common technical culture and "endemic uncertainties" about the consequences of their teaching. Schools advocating PLCs would seek to imbed teamwork within the structural and cultural fabric of the school to facilitate teacher development and student learning. To do so, as the name would suggest, PLCs borrow heavily from the ideas of "learning communities" for which Mitchell and Sackney give the following definition:

A learning community consists in a group of people who take an active, reflective, collaborative, learning-oriented, and growth-promoting approach toward both the mysteries and the problems of teaching and learning. (Mitchell & Sackney, 2001, p. 1)

PLCs claim to harness the power of teacher learning communities for demonstrable improvements in teaching practices and student learning.

Perhaps the clearest and most prescriptive description of PLCs was given by DuFour (2005). In an attempt to reclaim an idea he felt to be in danger of confusion, DuFour describes three critical "big ideas": there is a *focus on learning*, there is a *culture of collaboration*, and *judgements are based on results*. A focus on learning requires that teachers define what they want students to learn, determine how they will know when students have learned it, and, most importantly according to DuFour, decide what to do in the event that any student fails to meet learning goals. A culture of collaboration requires the allotment of regular time for teachers, organized into teams, to meet. Teachers in these teams share details of their classroom practices and continually work towards refining and improving instruction. The results upon which judgements are based

need to be defined in terms of student learning, and teaching teams need to work towards specific learning goals. Additionally, assessment is continuously carried out as a means to facilitate learning rather than just measure end results.

Implementing PLCs in the TEFL Community

PLCs involve the systematic, goal directed exchange of effective teaching practices among teams of teachers in a professional community. This professional community does not arise spontaneously but, instead, is imbedded within the structural and social fabric of the school. A school or language programme would need to demonstrate a number of characteristics.

1. There would need to be clear goals for teachers to work towards. These goals would need to be described in terms of student learning and would need to be measurable.
2. There would need to be an agreed upon system measuring learning vis-à-vis learning goals. This assessment process would need to be timely, if not continuous, so that information on learning progress is used to measure progress not just end results.
3. Teachers would need to be organized into teams. Within these teams there would need to be an open culture of collaboration where teachers share and reflect on teaching practices. The discussion would be continuously guided by results.
4. There needs to be a commitment on the part of teachers to work towards meeting (or even raising) learning goals, as well as addressing learning gaps wherever they might occur.
5. Time and resources would need to be allocated to teaching teams. This would require a commitment on the part of the school administration and coordinators.

What do PLCs have to offer the TEFL community?

The TEFL community has been buffeted by more than its fair share of teaching fads, and teachers would do well to view new approaches promising revolutionary changes with due caution. To some extent, the literature on PLCs reflects the highly charged political climate of the American public education system grappling with the introduction of the standards movement. Titles like “Whatever it takes” or “Learning together, leading together” can read suspiciously like the latest management fads. Still, this paper argues that aspects of PLCs offer the potential for positive change in the TEFL community, and three broad categories are outlined below.

PLCs have potential to synthesize diverse strands of educational research.

I suspect that many components of PLCs as outlined in this paper would be familiar to TEFL educators. Indeed the concept of learning communities as outlined by Mitchell and Sackney above holds many parallels with “action research.” There is the same focus on investigation into a specific question or problem within a given teaching context. In the case of PLCs the key difference is that the process of investigating the efficacy of classroom practices is carried out in teams and is imbedded within the school structure. In Brown’s description of curriculum development we see the similar themes of exploration, teacher dialogue, and student learning:

...curriculum development is a series of activities that contribute to the growth of consensus among the staff, faculty, administration, and students. This series of *curriculum activities* will provide a framework that helps the students to learn as efficiently and effectively as possible in the given situation. (Brown, 1995, p. 19)

A focus on learning, and learning objectives, is also a common theme in TEFL literature and a growing emphasis on results is reflected in the concurrent “evidence-based-education” movement whose effects have begun to permeate the TEFL field. Mitchell (2000) has outlined the potential of evidence-based education as a means to bridge the gap between applied linguistics and teaching practice in language education. The focus on systematic analysis of classroom instruction and its effects on learning parallels that advocated by proponents of PLCs. Instead of offering any radically new ideas, PLCs would appear to offer an opportunity to work towards a synthesis of current educational trends and their amalgamation in a given school or language program.

They present an opportunity for the breakdown of teacher isolation.

For the vast majority of TEFL teachers, our everyday teaching experiences occur primarily within the boundaries of classroom walls. The potential for teacher isolation holds as true for many of us today as it did for teachers in Lortie’s groundbreaking study more than 30 years ago (1975). PLCs tackle this problem where it needs to be dealt with: a teacher’s immediate teaching environment, be it a school or a language department. It does so by trying to imbed teamwork, including the open and critical exchange of teaching practices, within the administrative and

social fabric of schools. One could claim that their approach can be a little heavy handed, as some advocates appear to give teachers few options:

Collaboration by invitation will not work. It is never enough. This is a key point. In a professional learning community, collaboration is embedded into every aspect of school culture. (Eaker, 2002, p. 11)

This of course begs the question of whether true collaboration can be induced. Whatever the advantages for those teachers who embrace the transition, those who cannot adapt may find themselves on the way out. Still, setting aside for the moment the process of implementing PLCs and the means by which teachers are, gradually or not, brought on board, I suspect one would be able to find broad agreement among TEFL teachers that a movement towards the systematic sharing of ideas and information would be beneficial for teaching and learning. It is precisely this opportunity to build *context specific* professional communities that has the potential to be the greatest source of appeal to TEFL educators.

They offer a means to adjudicate competing pedagogies.

Another possible advantage of PLCs lies in their insistence on a teacher's immediate context as the arbiter of potentially confusing and conflicting methodologies. The efficacy of workshops, presentations, and TEFL literature is often blunted by a lack of relevance to a teacher's workplace. In PLCs, an ongoing critical examination of teaching practices and their effects on student learning serves as the selection process for effective methodologies. No claim is made as to best methods beyond that which can be demonstrated as effective in raising student learning. Innovations are welcome but only the successful are retained. Ideally, this would shelter teachers from the tides of teaching revolutions, and the overreactions and overgeneralizations they appear to repeatedly inspire.

Similarly, the teacher dialogue that PLCs demand should provide a filter for the sometimes overwhelming information on language learning and teaching methodology. How many TEFL teachers, if any, can claim to have a complete knowledge of language acquisition research and teaching pedagogy? How many teachers even feel confident that they are effectively and accurately filtering the information available for that which is relevant to their teaching context? A lot of what teachers "know" is often based as much on intuition and conjecture as on teaching theory and critical insights into practices. A community of teachers may not be foolproof but, as

Brown writes: “the collective wisdom of all the teachers (as helped by the curriculum developers and supported by the administrators) would logically be more appropriate, energizing, and creative in developing curriculum than the sum of each teacher trying to do so on his or her own” (p. 94). This collective wisdom should be all the more effective where it is guided by the extent to which teaching practice results in measurable learning.

Questions and concerns about PLCs

Further research is needed.

Any conclusions about the effectiveness of PLCs, particularly for a movement that so fervently embraces the importance of evidence, need to be grounded in research. In particular, PLC advocates need to demonstrate that studies indicating the effectiveness of PLCs are not simply descriptive. By their own admissions PLCs demand a high level of commitment and hard work from teachers, perhaps above and beyond that which is the norm. If so, this would suggest that they only take root in schools with a level of dedication among teachers also beyond the norm. While the evidence for the positive effect of PLCs on learning appears promising, EFL programs would need to demonstrate improvements in instruction and learning among a stable group of teachers over time.

There is a potential for exploitation.

Some might argue that the movement towards PLCs is also a process of exerting more control, effort, and work from reluctant participants. Indeed, one gets the sense that many results driven administrators would not hesitate to make extra demands on teachers to achieve learning targets. I suspect some in the TEFL field would see the potential for a sinister side to the breakdown of classroom walls demanded by PLCs, especially where salaries and job security do not warrant the level of work and commitment that could be demanded by an overzealous administration. To some degree, the participative process of PLC teaching teams at the local level should work towards negating systemic exploitation. The process is both participative and situation-specific, necessarily involving negotiations among teachers in schools and language programs. Still, it would appear that, in implementing PLCs, there is the potential for misunderstanding, and even exploitation, to occur. Administrators and program coordinators would certainly be wise to work

towards consensus, and teaching teams should be granted reasonable autonomy in setting goals and working towards them.

Are the results sustainable?

Another issue is the sustainability of PLCs. There is no point at which a professional community of teachers, devoted to improving teaching and learning, can call their job complete. The work requires sustained effort, with ever-evolving goals and student needs. Some research does seem to indicate that, while beneficial results can be obtained at the outset, sustaining that initiative over the long term may be more difficult (Giles & Hargreaves, 2006). In particular, the question whether PLCs can maintain increased learning over the long term while making reasonable demands on the time and efforts of participants, both teachers and students, needs to be addressed.

The diverse cultural and organizational environments of TEFL could present insurmountable hurdles.

The ultimate relevance and effectiveness of PLCs for the TEFL field will be determined by context, both cultural and institutional. PLCs have developed specifically within the public education system of North America and there no doubt will be serious, and even insurmountable, hurdles in applying those ideas to diverse TEFL contexts. To illustrate, the effective implementation of PLCs in my own context, the Japanese tertiary education system, would typically involve both structural changes and cultural changes. The structural changes would include the development of common objectives and teacher teams as well as the allocation of time and resources to allow teachers, both full-time and part-time, to regularly meet. The cultural changes would include a renewed focus on education and an atmosphere that encourages collaborative dialogue and reflective teaching practice. For many programs and schools these kinds of radical innovations may simply not be viable. PLCs are first and foremost context specific, and their feasibility will inevitably be determined at the school and language program level.

They require a commitment to assessment

Not surprisingly for a movement that owes some of its impetus to the development of the standards movement in the U.S., PLCs require a continuous commitment to measuring learning. Assessment, if done well, takes time and careful consideration and schools may be limited by a lack of time or resources, or by resistance from the students, teachers, or administration. However, schools need not commit themselves to a time consuming standard of assessment that would withstand the critical eye of a standardized testing expert. Standardized tests are not only an unrealistic goal they are also an inappropriate one within in a limited body of students. The goals, as well as the means of assessment, are decided locally by teams of teachers. In addition to traditional means of testing such as paper based tests or interviews, other means of assessment such as regular homework, student writing portfolios, student feedback, and even anecdotal teacher impressions of student progress, would be legitimate barometers of progress. The indispensable component would remain a reasonable degree of consensus among teacher teams in assessing student progress in achieving learning goals, and the willingness to measure, by any and all means available, success or the lack thereof.

Conclusion

What do PLCs have to offer the TEFL profession? The benefits would appear to lie in the coherence and focus of their ideas rather than any revolutionary concept underlying them. The important shift lies in asking the questions, “What makes for effective schools?” rather than just “What makes for effective teachers?” The answer, according to PLCs, lies in the development of organizational structures conducive to the development of successful communities of practice. I would suggest that this shift offers the following possible benefits for the TEFL field.

- There is a renewed focus on the importance of a teacher’s context, not simply their classroom but also the immediate school or language program in which they are working. There is renewed opportunity for context specific teacher development programs while simultaneously improving overall education with the school or language program.
- Schools and programs, not just individual teachers, are challenged to break down the professional isolation that still typifies much of the teaching profession, and facilitate focused and open sharing among all teachers. Organizations are held accountable for providing the support and resources to facilitate the development of constructive teacher dialogue.

- By requiring accountability for student learning, and a results-oriented dialogue among teachers regarding classroom practices, there is an opportunity to demystify the teaching-learning process and filter the often overwhelming, and even conflicting, research on language acquisition and methodology into relevant and coherent chunks.

In the end, one need only hold PLCs to the same standards they ask of participants, that of results.

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**“Drill, baby, drill”:
Exploring a Neurobiological Basis
for the Teaching of Segmentals in the ESL/EFL Classroom**

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Anna Dina L. Joaquin is a doctoral student in Applied Linguistics at UCLA. Her experiences with ESL teaching led her to be interested in the neurobiology of language use and language learning. Her research includes resonance and alignment in conversation and the role of caregiver-child attachment and bonding in language acquisition.

Abstract

Segmentals are the individual sounds of a language that can be broken down and focused on for instruction. Problems with segmentals can cause miscommunication, embarrassment, and affect confidence and motivation. Although teaching pronunciation and thus segmentals have been suggested to be a crucial element of second language curriculum (J. Morley, 1991; P. Robertson, 2003; T. Thompson & M. Gaddes, 2005), this component has often been neglected in curriculum that emphasizes a Communicative Approach to language teaching (S. Krashen & T. Terrell, 1983). Current research in neuroscience demonstrates that when we hear people talk, we are actually simulating their articulation and matching their pronunciation to stored templates in our brains. Furthermore, the brain may have an ability to learn or modify these templates. This may be a neural basis for the perception and acquisition of segmental speech features. Thus, the research discussed in this paper supports the development of ESL/EFL curriculum that integrates a focus on segmental features with a Communicative Approach.

Keywords: Segmentals, Speech Perception, Brain, Mirror Neurons, Phonological Acquisition

Introduction

Communicative competence is “that aspect of our competence that enables us to convey and interpret messages and to negotiate meanings interpersonally within specific contexts” (Brown, 1994, p. 27). Pronunciation, which includes segmental and suprasegmental features of a language, can affect communicative competence, for a speaker’s pronunciation can determine whether their spoken discourse is comprehensible to the listener. In fact, Robertson (2003) states that “intelligible pronunciation is an essential component of communicative competence” (as cited in Morley, 1991, p.4). Thus, research has shown that problems with segmentals can cause miscommunication, embarrassment, and affect confidence and motivation. Though teaching

segmentals is purportedly a crucial element of second language curriculum (Thompson and Gaddes, 1995) “many pronunciation teachers would claim that a learner’s command of segmental features is less critical to communicative competence,” (Celce-Murcia, Brinton, & Goodwin, 1996, p. 131) as there are strategies for clarification available to speakers. Techniques emphasizing segmentals have also been rejected on grounds that adults are unable to improve their pronunciation (Brown, 1994) and that such methods are incompatible with the Communicative Approach (Widdowson, 1978; Brumfit & Johnson, 1979), which has strongly influenced language curriculum.

Contrary to the notion that segmentals should not be emphasized, current research in neuroscience may support the integration of a focus on segmental features in ESL/EFL curriculum. Brain research shows that when we hear people speak, we are actually simulating their articulation and matching their pronunciation to stored templates in our brains. Furthermore, the brain may have an ability to learn or modify these templates. This may be a neural basis for the perception and acquisition of segmental speech features. Thus, in this paper I will discuss research that may support the development of ESL/EFL curriculum that integrates a focus on segmental features with a Communicative Approach.

Role of Mirror Neurons in Speech Perception

At the Haskins Laboratory at Yale University, Alvin Liberman and his colleagues attempted to create a device that could transform text into spoken words so that persons who had lost their eyesight would be able to “read” books, magazines, and newspapers. When Liberman tested his device among war veterans, he found that the veteran’s perception of the device’s speech output was incredibly slow – much slower than even the perception of distorted human speech. This observation led to a theory of speech which posits that the way our brain perceives speech is by simulating the talk ourselves. According to this motor theory of speech (Liberman & Mattingly, 1985), speech perception involves the transformation of an acoustic signal to an articulatory representation through the coordination of more than a hundred muscles in the mouth. Thus, the relationship between acoustic and articulatory forms raises the possibility that the motor system might play a role not only in producing speech but also in perceiving. Theorists suggest that when a person speaks to us, we are not only receiving an acoustic signal, but are in fact also

“articulating” the phonemic sounds within our brains. This perspective has been supported with the discovery of mirror neurons in the brain.

In the 1990s, a new class of neurons was discovered in the ventral premotor cortex (vPMC) or F5 region of the macaque monkey brain. These neurons are observed to discharge not only when the monkey executed actions, but also when observing similar actions executed by another. Therefore, they are suggested to be the mechanism that subserves action-recognition. They are called mirror neurons and have also been found in humans (Cochin, Barthelemy, Roux, & Martineau, 1998; 1999). Some researchers have also suggested that this mirroring mechanism has an essential role in speech perception.

Several studies have already demonstrated that there is neural activity in the brain, particularly in the premotor cortex (PMC), during passive speech perception. Among the first, was an functional magnetic resonance imaging (fMRI) study conducted by Buccino et al. (2001) in which participants observed a number of videotaped actions such as biting and chewing. The results of the study confirmed the speculation that mirror neurons in the PMC coded mouth actions. The activation of these areas in viewing speech has been confirmed by another study that found the same area used specifically during lip-reading, and more importantly not being activated during observations of other movements (Santi, Servos, Vatikiotis-Bateson, Kuratate, & Munhall, 2003). In another study carried out by Ferrari, Gallese, Rizzolatti, and Fogassi (2003), researchers found that one-third of mouth motor neurons in the PMC become active during the execution and observation of communicative mouth gestures.

Watkins, Strafella, and Paus (2002) by using transcranial magnetic stimulation (TMS) techniques, recorded motor evoked potentials (MEPs) from a specific lip and hand muscle. Subjects were exposed to four stimuli: continuous prose, nonverbal sounds, speech-related lip movements, and eye and brow movements. Compared to control conditions, listening to speech enhanced the MEPs recorded from the specific lip muscles. Furthermore, MEPs did not increase from the hand muscles when the subjects listened to speech. Similarly, Sundara, Namasivayam, and Chen (2001) found that visual observation of speech movement enhanced the MEP amplitude in muscles involved in the production of the observed speech.

In addition to evidence of neurons in the PMC activating while listening to passive speech, additional studies also suggest that neurons in this region are at work when an individual listens to *specific* phonological material. For example, in one study, Fadiga, Buccino, and Rizzolatti

(2002), recorded the MEPs from tongue muscles in normal participants who were instructed to listen carefully to verbal and nonverbal stimuli. The stimuli were words, pseudowords, and bitonal sounds. Either a double /f/ or a double /r/ was embedded in the middle of words and pseudowords (i.e. baffo, terra). /r/ a linguo-palatal fricative, in contrast to /f/, a labio-dental fricative, requires more tongue muscle movement. During the experiment, the participants' left motor cortices were stimulated. Interestingly, the results showed that compared to the stimuli with /f/, listening to words and pseudowords containing double /r/ created a significant increase of MEPs recorded from the tongue muscles.

In another fMRI study, subjects listened passively to meaningless monosyllables (i.e. /pa/ and /gi/) and produced the same speech sounds to examine whether motor areas involved in producing speech would be activated (Wilson, Saygun, Sereno, & Iacoboni, 2004). The research found that listening to speech bilaterally activated a superior portion of the vPMC. Another study confirmed the essential role of the PMC in speech perception (Meister, Wilson, Deblieck, & Wu, 2007). In this study, the researchers used fMRI to observe the PMC during three different perceptual tasks. The first was a speech perception task which involved discriminating between voiceless stop consonants in single syllables (i.e. pa, ta, ga) at baseline. The second task was a color discrimination task. The final task was a tone perception task, which involved recognition of pitch changes. At baseline, the average percentage of correct responses was 78.9% for the speech perception task, 76.6% for the color perception task, and 85.5% for the tone discrimination task. The researchers then disrupted the activity of the premotor cortex with TMS. When this area was disrupted the correct responses for the speech task fell to 70.6%. However, participants' color perception abilities were not disrupted and remained at 76.5%, and their tone discrimination abilities also did not decrease significantly. The results suggest that there is a strong trend toward a decrease in performance after TMS is applied to the PMC for the speech condition. Thus, in addition to the auditory system, mirror neurons in the left PMC are crucially involved in speech perception. Taken together, these studies indicate that when we listen to others, our motor speech brain areas are activated as if we were talking.

MNS and Segmental Acquisition in SLA

The studies mentioned are applicable to situations in which the participants have the same phonemic inventory. What happens in situations in which speakers have different phonemic inventories? Researchers in another fMRI study examined neural responses to non-native (non-English) phonemes, speculating that activity in brain areas involved in transforming the acoustic signal to a phonetic code would differ for native and non-native phonemes (Wilson & Iacoboni, 2006). The researchers chose 30 phonemes for the study: 25 non-English phonemes (i.e. postalveolar click, alveolar click, uvular ejective stop, dental click) and 5 English phonemes (i.e. voiced palatal fricative, voiced bilabial stop, voiced alveolar fricative). As expected, when native English speakers were asked to produce the phoneme sounds they were able to easily produce the English-like phonemes. The results also showed, not surprisingly, that motor areas were activated during speech production activities. However, activity in motor areas differed for native versus non-native phonemes. Bilateral superior temporal auditory regions were more active when participants attempted to produce the more difficult phonemes. The results also showed that motor areas were functionally connected to the superior temporal cortex. The finding that motor areas distinguish between native and non-native phonemes suggests that these regions are sensitive to whether or not phonemes are part of the speaker's inventory and that motor areas are actively involved in the speech perception process.

However, Wilson and Iacoboni (2006) suggest that our motor mouth neurons do not stop at distinguishing. When non-natives speak to natives, though their phonemes may not always be accurate, natives may still be able to comprehend what was said. Wilson and Iacoboni propose that when perceiving non-native phonemes, the PMC generates forward models of native phonemes to the superior temporal cortex, which matches auditory input to stored templates (Hickok & Poeppel, 2007). Therefore, when the speech is "not quite native" or a different dialect, the PMC provides top-down information and can facilitate the perception of less intelligible speech if there is a stored template that is similar (Wilson & Iacoboni, 2006, p. 322). This model may explain how it is possible that though a non-native's pronunciation may be "imperfect," natives are still able to comprehend the non-native's speech when their pronunciation is "close enough." Such research supports pedagogical notions that "pronunciation should be taught to a level of intelligibility rather than accuracy" (Celce-Murcia, Brinton, & Goodwin, 1996 p. 16).

Wilson and Iacoboni's (2006) study also raises the question of whether mirror neurons can develop mirroring properties or whether mirroring properties are fossilized. A study by Ferrari (Iacoboni, 2008) may provide some evidence that mirror neurons may be able to learn. Ferrari and his colleagues recorded the activation of neurons in the macaque monkey as the monkey observed the actions of experimenters. Though these monkeys did not use tools themselves, the researchers found that 20% of all the recorded cells responded to actions performed with the hands and mouth and also to actions performed with tools though much more weakly. This was the first evidence of mirror neurons being activated during the observation of actions supposedly absent in the motor repertoire of the monkeys since they are not tool users. The researchers and Iacoboni (2008) propose that "it is likely that these 20 percent of mirror neurons...are the result of repeated exposure of the animals to the sight of human experimenters using tools...[which] suggests that mirror neurons can acquire new properties..." (p. 42). Though this study involved monkeys and was related to actions of tool use, it has possible implications for SLA notions related to phonological acquisition. Research has generally shown that while adults are superior learners to children in vocabulary, syntax, and literacy (Scovel, 1969 cited in Brown, 2000), when it comes to pronunciation, adults are not expected to achieve native-like abilities (Brown, 2000). However, if mirror neurons involved in speech and perception can be modified through repeated interactions, then acquiring the phonology of a second language may be more attainable than previously suggested.

Furthermore, taken together with Wilson and Iacoboni's study (*ibid*), Ferrari's findings support notions that native language transfer can play a role in a learner's acquisition. It is generally believed that first language transfer plays a role in the acquisition of the sounds of the second language (Tarone, 1987). If a non-native's first language is phonologically closer to the target language, then the learner may actually have more difficulty in developing the motor template for a sound because the premotor cortex may mitigate the perception of the speech and thus interfere with learning and accuracy. This may explain, for example, why students will convert unclear input into a similar sound in their own language (Dalton, 1997). It is also possible that because the non-native's first language may be phonologically similar to the target language, repetition, practice, and exposure to the target language may facilitate learning. Further studies of

mirror neurons such as those done by Wilson and Iacoboni can hopefully provide more insight into the role of the first language in second language acquisition.

Conclusion

Success in communication does not simply rely on perceiving the segmental aspects of language; the prior discourse, gesture¹, context, and suprasegmental features of language are valuable resources that participants can depend on to facilitate communication. Furthermore, when those resources fail, there is a system of repair available to speakers (Schegloff, Jefferson, & Sacks, 1977; Schegloff, 1979). Thus, some researchers suggest that teaching segmentals is not as important as teaching other aspects of communicative competence. However, segmental features are still an aspect of communicative competence, and problems in this area can cause miscommunication, embarrassment, which can affect confidence and motivation.

The studies presented in this paper, may provide a neurobiological basis for speech perception at the segmental level. The studies suggest that when we hear people talk, we are actually simulating their articulation in our brains through mirror neurons. We are matching their pronunciation to stored templates in our brains, and if their non-native or dialectically different pronunciation does not perfectly match with ours, our brains “work” to find a match that facilitates comprehension. This provides some explanation as to why speakers are intelligible despite differences in dialect or problems with phonemes in their speech. Such findings also support the notion that teaching segmentals, at least to a level of intelligibility, to a non-native speaker can improve a learner’s communicative competence. In addition, research demonstrates that mirror neurons can learn. Thus, if research also demonstrates that mirror neurons involved in speech perception can be acquired, then such a finding supports the value of including a focus on segmentals (i.e. drilling) in a Communicative Language Teaching (CLT) framework (Hammond, 1995).

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¹ Because mirror neurons subserve action-recognition, they are also speculated to be involved in understanding iconic gestures (Iacoboni, 2008).