ABSTRACT
A survey confirms many teachers in Australian university English language centres believe helping Japanese learners with English /r/ and /l/ requires demonstrating the articulation of the two phonemes. Reasons are presented to suggest this method may not be ideal, and an approach is outlined which integrates insights from phonetics, psycholinguistics and communicative language teaching. Implications for how phonetics is taught during teacher education are considered.

Keywords: TESOL; Japanese; /r-l/ contrast

1. INTRODUCTION
Many Japanese learners of English experience difficulties with the contrast between /r/ and /l/, as in rock vs. lock. Errors are highly salient [1], yet famously resistant to change, with many learners frustrated by r/l problems even after proficiency in the language overall has been attained.

The difficulty of teaching r/l to adults has been blamed on a ‘critical age’, but this notion is now outdated [2]. Another possibility, offering more hope for a solution, is to locate the problem not in the learner but in the methods of teaching, and ultimately in teacher education. This paper supports the latter view by reporting results of a survey suggesting that r/l is commonly taught via less than optimal methods, and discussing how teachers might be prepared to provide more effective help with this important contrast.

2. A SURVEY OF TEACHER PRACTICE
The survey was administered via Survey Monkey in late 2009, with approval of the Human Research Ethics Committee of the University of XXX (Approval HEO9/199). Teachers were recruited via an email to administrative staff in eight university English language centres across eastern Australia. Like their UK counterparts, such centres generally take a communicative approach [3] to teaching.

The survey consisted of 15 questions about learners’ problems with /r/ and /l/, and how teachers address them. Most questions were multiple choice, but all offered opportunity for comments. One was open-ended (Q9: What do you consider to be the main reason students have problems with /r/ and /l/?). Questions and quantitative results are available in the Appendix, with key findings summarised here.

In total, 60 teachers participated. Almost all were native speakers of English, with around two-thirds having experience learning another language (Q3). They were accomplished teachers, 70% having taught for more than six years (Q1), and 86% rating themselves as ‘comfortable’ or ‘proficient’ in teaching pronunciation (Q4). In particular, they were familiar with r/l issues, 86% stating that in a typical year ‘some’ or ‘most’ of their students have difficulties with /r/ and /l/ (Q5).

Around 60% found r/l problems ‘somewhat’ or ‘very’ serious (Q8). Almost all stated it is at least ‘somewhat important’ that learners master r/l (Q11), and that they are unlikely to succeed without help from a teacher (Q7).

However, only 11% found it ‘easy’ to help students with /r/ and /l/, while 32% believed it is hard in principle (Q10), and nearly 40% personally found it hard (Q14). In comments, six cited lack of time, and 11, low student motivation, as key factors making it hard to teach /r/ and /l/. About 50% felt that only ‘few’ or ‘some’ of their centre’s students could use /r/ and /l/ appropriately by the time they graduate (Q15).

Turning to participants’ thoughts on the cause of r/l problems: virtually all indicated that, for them, the issue was at least partly one of production (Q6). Of the 51 teachers who answered the open-ended question (Q9), 40% stated that students are unable to articulate /r/ and /l/ because their first language lacks one or both of the sounds; 20% stated it is because the first language does not distinguish the sounds; 14% invoked a cause of ‘first language interference’; and 16% suggested the problem had fossilised because it was not tackled early in their English language education.

Unsurprisingly, given these views on the cause of the problem, 80% of respondents included the option ‘train articulation’ as one of the most effective ways to help students (Q12), and of the 16 comments, six (38%) strongly reinforced the
need to give help with articulation, via mirrors, diagrams or hand gestures. Other methods considered effective were ‘train perception’, ‘error correction with feedback’ and ‘minimal pairs’.

Finally, with regard to the source of their knowledge about how to teach /r/ and /l/ (Q13), all teachers cited ‘personal experience’, while around 20% also nominated ‘personal action research’ and a similar number, ‘professional development’. Only one cited published research as a source of information.

3. LIMITATIONS OF THE ARTICULATORY APPROACH

Though merely a snapshot, the survey indicates many teachers believe Japanese learners’ problems with r/l are caused by difficulty in physically producing the sounds. However, this is at odds with the view standard among phonetics researchers. Situations like r/l are commonly explained [19] by reference to the distinction between phonetics and phonology. On the level of phonology, it is true that, where English has two phonemes /r/ and /l/, Japanese has one, typically transcribed as /r/ (but equally well represented with /l/). However, on the level of phonetics, this single Japanese phoneme (like all phonemes) has several variant pronunciations, or allophones. These are under-researched (cf. [4]) but have been confirmed by acoustic analysis [5] and ultrasound [6] to include sounds that serve well as English /r/ and /l/.

This suggests learners’ difficulty with English r/l is not inability to produce appropriate sounds. Rather, the problem seems to be that Japanese speakers do not notice the differences in their own production of the Japanese /r/ phoneme – naturally enough, since such allophonic differences (by definition) do not distinguish words of different meaning. This insight has been the basis of extensive psycholinguistic research, discussed in the next section, promoting a shift of focus from production to perception.

4. PSYCHOLINGUISTIC APPROACH

Interestingly, the original aim [7] of research on Japanese learners’ problems with /r/ and /l/ was to disprove the ‘critical age hypothesis’, by demonstrating that adults can be trained to perceive even this very difficult contrast.

After considerable experimentation, a method was devised which successfully trained r/l perception [8, 9]. It involves preparing recordings of several English speakers producing r/l minimal pairs (e.g. rent/lent, clock/crock, lorry/lolly). These recordings are built into a computer-based training program in which learners see both members of a pair (e.g. tally, tarry) on the screen, while hearing one member of the pair (tarry) through headphones. Their task is to indicate with a keystroke which of the two words they think they heard. If they are right, their score increments and they move on; if they are wrong, they hear the word again with the correct answer highlighted, and then move on.

Experiments testing subjects’ perception and production, having them take the computer-based training every day for three weeks, then testing perception and production again, demonstrated significant improvement, which generalised to new words and new speakers, and lasted over time. This fulfilled the aim of debunking the critical age hypothesis – but the results are far more important than that [7].

Only perception was trained, but both perception and production improved. This lends strong support to the view, widely accepted by second language speech researchers [10], that the key problem is not articulation, but discrimination.

This in turn supports the suggestion made in the introduction: the common teaching practice of demonstrating the articulation of sounds learners can already produce perfectly well may be confusing and counterproductive, hindering learners from reaching their full potential.

5. LIMITATIONS OF THE PSYCHOLINGUISTIC APPROACH

Though some teachers in the survey indicated they used minimal pairs and a perception-based approach, the method of these experiments has clearly not been widely taken up.

This may be because, important as the experimental results were in countering the critical age hypothesis, they are severely limited from a teaching and learning perspective. The method is essentially a return to the deprecated ‘drill and kill’ training of the 1950s [11]. Subjects work through 272 minimal pairs in random order, with no hint of contextualisation or instructional design. Though this may be necessary in an experiment, it does not integrate well with the communicative style of modern language teaching – and few schools could replicate the experimental conditions, which featured individual study booths attended by a
research assistant, and a financial incentive to ensure subjects completed the course.

In fact, from the perspective of modern language teaching, it is surprising the experiments were successful at all – and it is important to point out that, although improvement was statistically significant, on average learners gained only about 15 percentage points over initial scores around 60%. This means that, even after the grueling training, they were still making an average of 20-30% errors (on word-lists; transfer to spontaneous speech was not tested). Though it has been suggested this may represent a theoretical limit on r/l learning [12], many learners, and teachers, would hope for a better outcome.

Looking at the experimental design in more detail gives reason to nurture this hope. Anyone who has learned a foreign language is familiar with the experience of being unable to discriminate words which native speakers insist are different. In this situation, what learners usually need is to hear both words repeatedly, side by side. Strangely, however, no opportunity to do this was given in the r/l experiments: following an error, subjects heard the difficult word just once, alone, and moved on.

To investigate the effects of integrating this insight from learning and teaching, an experiment was run [13], identical to the above description, except allowing users to play both words. This resulted in significantly improved scores – and surely more improvement is possible by further integrating insights from both theory and practice.

6. AN INTEGRATED APPROACH

To develop a better method, it is useful to consider why designers of the experiments did not build in the easy-to-implement option of letting learners contrast r/l words. The reason may be found in the computational model of speech processing that forms their theoretical framework. According to that model, the reason allophones are hard to discriminate is that they exist at levels of processing inaccessible to conscious awareness. On this view, the r/l contrast cannot be ‘taught’ in the usual sense, but requires ‘training’ the subconscious mind, much as a computer is ‘trained’ for speech recognition.

While the computational model has been accepted in theoretical psycholinguistics for many years [14], it may not be ideal for teaching and learning contexts. An alternative which takes account of the phonetic facts, the psycholinguistic evidence, and the lived experience of teachers and learners, may offer more practical guidance on how to help learners. Such a framework is given by socio-cognitive theory, which sees cognition, not as subconscious computational rules, but as embodied, socially-situated engagement with a meaningful world [15].

Socio-cognitive theory has been strong in applied linguistics for decades, but its application to pronunciation teaching is relatively recent [16]. In brief, this aims to transcend the division between ‘perception’ and ‘production’ by recognising that both are driven by cognition. Thus, for r/l, the problem is not that learners cannot produce or perceive the sounds, but that they do not conceptualise them as phonemes.

A crucial difference from the computational model is that phonemes are seen as the product, not of subconscious computational processing of allophones, but of conscious analysis of words, to develop ‘phonological awareness’ of the kind native speakers acquire during literacy education [17].

On this view, the solution for r/l problems is not training but teaching – via a phonological awareness program similar to that used with children, but adapted to the interests and cognitive skills of adults. This approach integrates well with the meaning-centred communicative teaching style popular today, and, though outcomes have yet to be formally evaluated, early indications are that it can be found surprisingly easy and surprisingly successful by both teachers and learners.

The question then is how to make the insights of the socio-cognitive perspective widely available to teachers dealing with r/l issues – and the answer involves change in teachers’ phonetics education.

7. IMPLICATIONS FOR TEACHER EDUCATION

It is well known that language teachers tend to find phonetics ‘hard’. In an effort to simplify for them, textbooks aimed at teachers typically offer a single phonetic description for each English phoneme. For /l/ and /r/, these might be ‘voiced lateral approximant’ and ‘voiced retroflex approximant’. While the intention to simplify can be respected, the problem with this approach is that it simplifies for teachers at the expense of making it harder for them to simplify for learners.

Such descriptions of /r/ and /l/ reinforce the inaccurate everyday view that each phoneme is an
individual ‘sound’, with a unique articulation. In reality, both phonemes cover a wide range of allophones. Though these are typically not noticed by native speakers, it is not difficult to bring them to teachers’ awareness, by considering a series of words like rain, train, drain, three, prune, etc. On first impression these all contain ‘the same sound’, /r/, but closer observation shows the actual pronunciation is subtly different in each word. In fact, some differences are not subtle at all. For example, the first part of train is closer to the first part of chain (a different phoneme, /ʃ/) than to the first part of rain (the same phoneme, /r/) – as seen in common children’s errors such as ‘chrain’ [18].

The intention of such observations is not for teachers to learn technical descriptions for all the allophones – and certainly not for them to teach these to learners. Rather it is to raise questions in teachers’ minds as to why they had never noticed this kind of allophonic variation before. The answer, of course, is that English speakers learn as children to ignore the substantial differences among the allophones of /r/ and /l/ because they play no role in differentiating word meanings. At the same time, the difference between allophones of /r/ and allophones of /l/ becomes highly salient to them, precisely because it does make a difference to English word-meaning. The upshot is that English speakers confidently use different allophones in rain, train, etc., yet equally confidently (even obstinately) believe themselves to be producing ‘the same sound’, /r/. The existence of allophonic variation, and the fact it goes unnoticed, is typical of every phoneme in every language [19], including Japanese /r/, as discussed above. Having their ‘ears opened’ to English allophones can help native-speaker English teachers empathise with Japanese (and other) learners who do not notice the difference between /r/ and /l/. Without such ‘ear-opening’, however, the explanation that learners do not notice such an ‘obvious’ difference may not occur to them. They fall back on an articulatory cause – rarely observing that, unlike, say, German learners, who may pronounce /r/ or /l/ ‘oddly’, Japanese learners produce both sounds perfectly well, showing their problem to be not difficulty of articulating them but a tendency to ‘mix them up’.

8. CONCLUSION

Teachers’ effectiveness in helping learners with r/l may be improved by including more phonetics in teacher education programs. The key, however, is to frame the phonetics in socio-cognitive, rather than computational theory [16]. This allows a shift of focus from providing technical explanations for learners’ problems, to offering practical advice on how to help them overcome their problems, within an overall communicative teaching program.

9. REFERENCES

10. APPENDIX

Q1: How long have you been an English Language Teacher?
Less than a year 5.3% 3
1-5 years 24.6% 14
6+ years 70.2% 40
Comments: 6
Q2: How long have you taught English in the university sector?
Less than a year 15.8% 9
1-5 years 43.9% 25
6+ years 40.4% 23
Comments: 5
Q3: How would you describe your own language background?
Native speaker of English (not proficient in another language) 27.8% 15
Native speaker of English but have learned a language whose speakers typically have difficulties with English r/l (eg. Japanese, Korean, Thai) 33.3% 18
Native speaker of English but have learned a language whose speakers do not have difficulties with English r/l 33.3% 18
Native speaker of a language whose speakers typically have difficulties with English r/l (eg. Japanese, Korean, Thai) 0.0% 0
Native speaker of a language other than English whose speakers typically do not have difficulties with English r/l 5.6% 3
Do you feel your language background gives you special insight into the difficulties learners have with English r/l? Please comment 19
Q4: How would you rate yourself in pronunciation teaching?
Expert 6.9% 4
Proficient 31.0% 18
Comfortable 55.2% 32
Reluctant 6.9% 4
Avoid 0.0% 0
Comments: 7
Q5: How many of your students in a typical year would have difficulties with English /r/ and /l/?
All of them 0.0% 0
Most of them 22.8% 13
Some of them 63.2% 36
A few of them 14.0% 8
None of them 0.0% 0
Comments: 7
Q6: Is their difficulty with /r/ and /l/ mainly in perception or production?
Perception 0.0% 0
Both 45.6% 26
Production 45.6% 26
Not sure 3.5% 2
Other (please specify) 5.3% 3
Q7: To what extent are students able to overcome /r/ and /l/ difficulties with no intervention from a teacher, in your opinion?
Not at all 15.8% 9
With effort 73.7% 42
With luck 3.5% 2
With aptitude 7.0% 4
Easily 0.0% 0
Comments: 9
Q8: How serious a problem is difficulty with /r/ and /l/ for students, in your opinion?
Very serious 3.6% 2
Somewhat serious 57.1% 32
Not very serious 39.3% 22
Inconsequential 0.0% 0
Comments: 9
Q10: To what extent is it possible, in your opinion, for teachers to help students overcome difficulties with /r/ and /l/?
Easy 11.3% 6
Somewhat 56.6% 30
Hard 32.1% 17
Impossible 0.0% 0
Comments: 15
Q11: How important do you consider it to help students overcome /r/ and /l/ problems?
Very important 24.5% 13
Somewhat important 71.7% 38
Not important 3.8% 2
Comments: 13
Q12: What do you consider to be the most effective way to help students overcome difficulties with /r/ and /l/? You may check more than one option if you wish; please expand your answer in the comments box.
train articulation 82.7% 43
train perception 55.8% 29
written exercises 1.9% 1
error correction with feedback 61.5% 32
minimal pairs 53.8% 28
natural speech 30.8% 16
other 9.6% 5
Comments: 16
Q13: Are your answers in this section based on (multiple answers possible. Please expand in the comments box)
Your personal experience as a teacher 100.0% 53
Your own action research or other classroom based research 18.9% 10
Published research 1.9% 1
Information provided to you by teacher education or professional development courses 22.6% 12
Comments: 7
Q14: How easy do you personally find it to help students overcome difficulties with /r/ and /l/?
Easy 11.3% 6
Somewhat 50.9% 27
Hard 37.7% 20
Impossible 0.0% 0
Comments: 11
Q15: How successful is your Centre/School overall (as opposed to you personally) in helping students who have difficulties with /r/ and /l/ when they first arrive?
All students can use /r/ and /l/ 2.0% 1
Most students can use /r/ and /l/ appropriately by the time they graduate 47.1% 24
Some students can use /r/ and /l/ appropriately by the time they graduate 45.1% 23
Few students can use /r/ and /l/ appropriately by the time they graduate 5.9% 3
No students can use /r/ and /l/ appropriately by the time they graduate 0.0% 0
Comments: 8