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To *r* or not to *r*: social correlates of /ɹ/ in Singapore English

Abstract: This paper seeks to determine the correlation between the occurrences of postvocalic-*r*, intrusive-*r* and linking-*r* in Singapore English (SgE) and the users' education levels and socioeconomic status. This paper will also investigate the attitudes that SgE speakers hold toward the use of postvocalic-*r* and intrusive-*r* in the language. The results show that there is a direct correlation between the education level and socioeconomic status of the speaker and the production of postvocalic-*r* and intrusive-*r* in SgE. Speakers of higher education levels and socioeconomic status have a tendency to produce the postvocalic-*r*; speakers of low education levels and socioeconomic status have a tendency to produce the intrusive-*r*. The attitudes test also shows that users of postvocalic-*r* are viewed more positively as compared to users of intrusive-*r*. The results suggest that postvocalic-*r* and intrusive-*r* are not simply concrete, categorical phonological processes, but that their uses are motivated by social factors.

Keywords: postvocalic-*r*; intrusive-*r*; /ɹ/-sandhi; Singapore English; sociophonetics

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1 What's with the *r*-s?

This paper investigates the occurrences of postvocalic-*r*, intrusive-*r* and linking-*r* in Singapore English (SgE) and their correlation to a speaker's education level and socioeconomic status. Singapore English (SgE) has commonly been described as and believed to be a non-rhotic variety of English (e.g. Low and Brown 2005; Deterding 2007; Salbrina and Deterding 2010). In rhotic varieties of English, /ɹ/ occurs wherever there is an ⟨r⟩ in the spelling in word final positions, e.g. *car* [kɑɹ] and before a consonant, e.g. *cart* [kɑɹt]. The /ɹ/ in rhotic varieties is referred to as the postvocalic-*r*. American, Scottish and Irish Englishes are examples of rhotic varieties (Wells 1982). In contrast, non-rhotic varieties only allow /ɹ/ to occur before a vowel (Crystal 2003). Non-rhotic varieties of English also often see a

phenomenon commonly referred to as /ɹ/-sandhi. /ɹ/-sandhi involves the intrusive-*r* and linking-*r*, which, while appearing in different orthographic environments, are sometimes taken to be the same phenomenon. Intrusive-*r* occurs when there is no orthographic ⟨r⟩ present, e.g. *clawing* [klɔɹiŋ] and *ma* [mɑɹ] (Hay and Maclagan 2010). The use of intrusive-*r* is phonologically conditioned, usually occurring only after non-high monophthongs, or after diphthongs with non-high offglides. However, as Hay and Maclagan (2010) observe, in New Zealand English, young speakers are also beginning to use intrusive-*r* after /au/, e.g. *now-/ɹ/-and then*, or *plough/ɹ/ing*. Linking-*r* is similar to the intrusive-*r* in its realization and vocalization. The difference is that in the case of the linking-*r*, the underlying /ɹ/ is assumed to be retained or inserted to either "serve as a hiatus-breaking element, or to provide a sufficient onset or coda to the following or preceding syllable, respectively" (Gick 1999), e.g. *deer* [diə] → *deer is* [diəɹiz].

As a result of an assumed "non-rhotic" nature of SgE, there has been little written on this subject in SgE. Only two studies (Tan and Gupta 1992; Salbrina and Deterding 2010) so far have been devoted to investigating rhoticity in SgE. Salbrina and Deterding (2010), for instance, when comparing SgE and Brunei English, found that SgE was non-rhotic and exhibited far fewer instances of rhoticity than Brunei English, with only 8.3% of their SgE tokens showing features of rhoticity. In contrast, the earlier work by Tan and Gupta (1992), interestingly, observed some degree of rhoticity in SgE. Tan and Gupta further suggest that the use of postvocalic-*r* is a prestige feature for some speakers. Poedjosoedarmo (2000) argues that SgE is influenced by the American media. While describing phonological features of the speech of Singaporean newscasters and radio deejays, she found American English-like characteristics in SgE, but noted very few instances of postvocalic-*r*. This kind of ambivalence with regard to rhoticity in World Englishes, especially of the Southeast Asian varieties, is not unusual. Baskaran (2004: 1039) for example, suggests that Malaysian English is non-rhotic, but Hickey (2004) states otherwise.

The question remains: is SgE rhotic or non-rhotic? Is this a situation of SgE moving from a non-rhotic variety to a rhotic variety? Or if one could take the few above-mentioned studies on rhoticity in SgE into consideration in a synchronic way, could it be possible then that SgE has always been rhotic but in recent years lost its rhoticity? This would explain the apparent signs of rhoticity as observed in the earlier work of Tan and Gupta in the early 1990s; and what Salbrina and Deterding (2010) would observe 10 years later would be a sign of SgE derhoticizing. Derhoticization in English is not entirely without historical and phonological basis, as the loss of rhoticity was evident in London English in the 18th and 19th centuries in upper class speech in London (Mugglestone 2003). Stuart-Smith (2007) and Lawson et al. (2011) would make similar observations of derhoticiza-

tion in Scottish English. Or could it be that these studies on rhoticity in SgE have reached different conclusions because of methodological and experimental orientations?

While derhoticization is a historical and phonological fact, the idea that SgE has derhoticized seems implausible. For one, SgE is based on a British model. Singapore, being an ex-British colony, has a British English-based education system, and even after Singapore gained independence in 1965, the preference for British English as the "standard" continued to be perpetuated by the Cambridge-trained then Prime Minister, Lee Kuan Yew. One could assume therefore that SgE will be non-rhotic in nature, given that Standard Southern British English (the adopted norm in Singapore) is also non-rhotic. In addition, the earlier works by Tan and Gupta (1992) and Poedjosoedarmo (2000) in fact see evidence of the trajectory of SgE heading toward more rhoticization, and not the other way round. Tan and Gupta, in particular, made the following remarks:

> The pattern of use of post-vocalic /r/ in Singapore English appears to be undergoing change. . . . The presence of post-vocalic /r/ has never been mentioned in studies of Singapore English pronunciation. From informal observations over recent years, however, Gupta has come to feel that some Singaporeans – more specifically, young and high-prestige individuals – increasingly display post-vocalic /r/-usage in their speech. (Tan and Gupta 1992: 139)

The underlying assumption behind the above comments is that SgE has always been non-rhotic. In the case of SgE, rhoticity seemed, to Tan and Gupta two decades ago, to be a new development in SgE and that it was found only in a selected group of Singaporeans. Their study on 21 speakers of ages 10 to 42 found varying degrees of postvocalic-*r* use, with 4 speakers who had more than 60% of postvocalic-*r* occurrences in their tokens, and the rest of the speakers averaging about 20%. Their results, as a preliminary study, while not conclusive, do provide some evidence for the increasing use of postvocalic-*r* in SgE. One important conclusion in their study, as a point of corroboration to the classic Labov study of postvocalic-*r* in New York City in 1966, is that the use of postvocalic-*r* is restricted to a select group of speakers and correlated to social factors. Tan and Gupta's paper unfortunately did not give information about their informants beyond their age and sex, and it remains unclear, to date, if the use of postvocalic-*r* in SgE can be said to be really following the classic Labovian hypothesis of 1966. And twenty years from Tan and Gupta's study, what is the state of rhoticity in SgE? Has SgE become even more rhotic now? If so, is rhoticity still restricted to a selected group of speakers, and who are these speakers? Would one be able to say if social class or other social factors have a role to play in the use of postvocalic-*r* in SgE?

Tan and Gupta's study also claimed that postvocalic-*r* is perceived as a prestige factor by those who used it. In fact, 9 out of their 21 speakers reported that they found the use of postvocalic-*r* to be prestigious, and this number included two ten-year-old children. There was however no indication in their paper of how the "prestige" rating was obtained, but it would seem methodologically questionable to ask the speaker if their use or non-use of postvocalic-*r* is due to prestige. It is not unsurprising that speakers who did use postvocalic-*r* reported that it is prestigious, and speakers who did not reported otherwise. Furthermore, one wonders how non-linguists (assuming that their informants are non-linguists) and 10-year-old children can perceive or reflect on their use of postvocalic-*r*. While their conclusions do not stand very strongly without further details about how they obtained them, they nonetheless raised an important question on the perception of postvocalic-*r* in SgE. How do speakers of SgE in general perceive the use of the postvocalic-*r*? In other words, what are the attitudes of SgE speakers to the use of postvocalic-*r*?

Even though Tan and Gupta set out to look at only postvocalic-*r*, they observed that 5 of their speakers also used linking-*r* and intrusive-*r*. They suggested that this was due to hypercorrection and "the mixed origins of (r) in Singapore English as well as the linguistic instability of (r)" (Tan and Gupta 1992: 148). The occurrences of linking-*r* and intrusive-*r* in SgE are interesting, especially when they are found in the same speakers who produced the postvocalic-*r*. While it is typical that linking-*r* and intrusive-*r* are found in non-rhotic varieties of English, their occurrences are usually in complementary distribution to the postvocalic-*r*. In fact, Hay and Sudbury (2005) observe, from historical data in New Zealand English, that the linking-*r* and intrusive-*r* made their appearance only when New Zealand English was losing its rhoticity. Besides the brief mention of linking-*r* and intrusive-*r* in Tan and Gupta (1992), there has not been any detailed study looking at the occurrences of intrusive-*r* and linking-*r* in SgE. It is unclear if the postvocalic-*r*, intrusive-*r* and linking-*r* are occurring in complementary distribution in SgE. If all three /ɹ/ – the postvocalic-*r*, intrusive-*r* and linking-*r* – are to be found in SgE, do they present a new phonological phenomenon, or are they motivated by sociolinguistic factors?

In view of the above gaps, this paper seeks to answer the following research questions:

1. Do speakers of SgE use postvocalic-*r*, linking-*r* and intrusive-*r*?
2. If so, who are the speakers, and is there a correlation between the speakers' educational level and socioeconomic status and the use of the above three different /ɹ/?
3. What are the attitudes of SgE speakers to the use of postvocalic-*r* and intrusive-*r* in SgE?

To answer research questions (1) and (2) above, speakers of different education levels and socioeconomic backgrounds were recorded reading a carefully designed list of sentences meant to elicit the postvocalic-*r*, linking-*r* and intrusive-*r*. This production exercise and the analysis of their production will be described in the following section. Research question (3) is an attitudinal task, and the methodology and the results will be presented following the section on the production task.

2 Data collection for /ɹ/-production

2.1 The informants

24 native SgE speakers were recorded. The speakers recorded are female and aged 18–25 at the time of recording. Females, rather than males, were recorded as women's linguistic behaviour, according to Trudgill (1972) and Labov (1990), are more likely to be driven by community prestige norms, as opposed to men's. Labov (1990) in addition argued, from his Philadelphia data, that women's use of linguistic variants are driven by both global and local prestige norms. If the use of postvocalic-*r* is indeed considered to be a prestige marker within the Singapore community, as asserted by Tan and Gupta (1992), then females will be more likely to produce them.

All 24 speakers are Singaporeans of Chinese ethnicity. A conscious decision was made to only record Chinese speakers, as opposed to including speakers from the other two major ethnic groups in Singapore – the Malays and Indians. For one, the Chinese forms the majority of Singapore's population, with 76.8% of the population belonging to this group, followed by the Malays at 13.9% and the Indians at 7.9% (2010 Singapore Census of Population). Using speakers of the dominant ethnic group can be said to be representative of a larger group of Singaporeans. More importantly, it may be possible that there are ethnic group differences in the use of the postvocalic-*r*, linking-*r* and intrusive-*r* due to the different linguistic backgrounds of the speakers. As a preliminary study, it is necessary for this paper to control the ethnic group of the speakers to reduce the number of variables and leave the investigation of ethnic differences in the use of /ɹ/ for future work.

All the speakers recorded are English-Mandarin Chinese bilinguals. They can be said to be products of a State-engineered bilingual education program, which Pakir (1991: 111–120) describes as "English-knowing" bilingualism. For these speakers, as with all Singaporeans born after independence, two languages –

English and their State-assigned "Mother Tongue" – are mandatory in the school curriculum for the first ten years of their formal education. The designated "Mother Tongue" for the Chinese community is Mandarin Chinese, and thus the speakers in this study are young Singaporeans who can be said to be bilinguals of English and Mandarin Chinese.

As education level and socioeconomic status are the key variables in this study, some care was taken in the choice of the speakers. In terms of education levels, the speakers came from three groups of post-secondary educational institutions in Singapore. The first group of speakers consists of undergraduates at one of Singapore's universities – in this case, the university where the author is teaching. The second group consists of students from institutions called the "polytechnics" in Singapore. The polytechnics in Singapore are post-secondary institutions that provide more practical training for high school leavers who may not have qualified for university entrance, or have decided to go for more practical "hands-on" courses instead of academia. Polytechnic graduates receive a diploma instead of a degree. The third group of participants consists of students at the Institutes of Education (ITE). The ITE is an institution that provides apprenticeship-like training to high school leavers, and students are trained for jobs such as mechanics, nursing assistants or office assistants. Most of these students would not have qualified for the polytechnics. This group of students can be said to be the least academically inclined. In terms of an educational hierarchy, it is widely recognized in Singapore that the university is the highest, followed by the polytechnics and then the ITEs. The 24 speakers in this study can be classified into these three above groups of 8 participants each, and at the time of recording in September 2010, all the speakers were students at one of these institutions. The author acknowledges at this point that this kind of classification is fairly broad and general, and that there would be cases where the Singaporean students do not fall neatly into these three categories. However, to ensure comparability across the groupings, effort was made to select participants who fit the above "norms".

While it was relatively simple to use the education levels of the speakers as a tool for sampling, it was more complex to determine their socioeconomic status, as the speakers were all students and were relatively young. In the determination of socioeconomic status, Labov (1966) used a three-component index comprising of occupation, education and family income in his New York City study, and Trudgill (1974) included other components such as locality of residence and housing type (see Chambers [2003: 39–61] for an extensive discussion on the sociolinguistic treatment of social class). Occupation, across most studies, is the key indicator of one's social class. Since all the speakers were students, their socioeconomic status would have to be determined by some other factors. Currie et al. (1997)

established that the occupation of the father is a good indicator for the social class of adolescents. Hay and Maclagan (2010) also used the occupation of their participants' parents to determine the social class of their participants, who were also students at the university. Using these works as references, in this study, the social class of the speakers will be determined by the educational attainment and the occupation of the speakers' fathers.

In addition to the above, the languages spoken in the household are also used as a supplement to the speakers' and their families' social status in Singapore. This is because social stratification in Singapore is marked very clearly by the languages used in the household. This phenomenon can be said to have started from the early days of the *Speak Mandarin Campaign*, which began in 1979, and which was set out to eliminate the Chinese "dialects" other than Mandarin Chinese. According to the then Prime Minister, Lee Kuan Yew, if these "dialect"-speaking speakers did not wish their children to be left behind in terms of access to economic and social opportunities, they should not retard or "burden" their children's climb out of their "dialect" trappings by continuing to speak to them in their native idioms or mother tongues (Lee [1979], cited in Tan and Goh [2011]). The underlying message here is that the users of other Chinese "dialects" have low social status. In the 1999 National Day address of Goh Chok Tong, Singapore's Prime Minister from 1999–2004, this social class distinction by language use was made clearer when he made a distinction between two types of Singaporeans: the "cosmopolitan" Singaporean and his "heartlander" counterpart. "Cosmopolitan" Singaporeans are those who "speak good English but are bilingual" and "have skills that command good incomes". The "heartlander" Singaporeans have "skills that are not marketable beyond Singapore. . . . They include taxi-drivers, stallholders, provision shop owners, production workers and contractors. . . . If they emigrate to America, they will probably settle in Chinatown, open a Chinese restaurant and call it 'eating house' " (Goh [1999], also cited in Tan and Goh [2011], and see the same article for an extensive discussion of the distribution of social class by language use in Singapore). Clearly, the "cosmopolitan" Singaporean is higher on the social hierarchy, and he/she is an English-speaking bilingual. The "heartlander" Singaporean, speaking bad English or no English, and, within the Chinese community, therefore probably speaking only Mandarin or Chinese "dialects", is the one who is economically and socially disadvantaged.

The speakers for the production task are therefore chosen based on: (1) their education level, (2) their father's occupation, (3) their father's education level and (4) the languages they speak at home. With that, the participants are grouped into three groups with respect to their social class and education. For ease of reference, the first group, which can be said to be the one with the highest

Group	Participant's education	Father's education	Father's occupation	Father's socio-economic status	Primary household language
1 High	University	University	manager; engineer; CEO; surgeon; lawyer	Upper middle class	English
2 Middle	Polytechnic diploma	Polytechnic diploma	salesperson; shop assistant; housing agent; secretary; clerk; car salesman	Lower middle class	Mandarin
3 Low	ITE (apprentice-ship)	High school/ no formal education	electrician; construction worker; technician; printing worker; crane operator; taxi-driver; forklift operator; odd-job laborer	Working-class	Chinese "dialects"

Table 1: Summary of the speakers' background and respective groupings

socioeconomic status and education will be referred to as Group H, the second group as Group M, and the last group as Group L. Table 1 presents a summary of these three groups of speakers based on the speakers' education, father's education and occupation and the languages they speak at home.

The university students, all of whom were students of the author, were recorded in the Linguistics laboratory at the author's university. The speakers from outside the university were sourced through the network of family and friends of the author's students. These speakers were also asked to do the recording in the Linguistics laboratory, but in some cases where travelling to the university proved to be too inconvenient for them, they were recorded in a quiet room in either their homes or schools. All the recordings were done using the Marantz solid-state recorder (PMD660). Each recording session took no more than 20 minutes. While the university students did the recordings out of goodwill, the other speakers from outside the university were paid a token sum of $10 each as compensation for their time, travelling cost and inconvenience.

2.2 The reading list

As it was difficult to ensure adequate and appropriate environments for the occurrences of postvocalic-*r*, intrusive-*r* and linking-*r*, the advantages of natural and

spontaneous speech were sacrificed in favor of a reading task. This method of data collection ensured sufficient data for all three types of /ɹ/ that this paper is looking at, and more importantly, it also allowed for a fair comparison across all the speakers. The participants were asked to read aloud a set of 50 sentences that were designed with phonological environments for the occurrences of postvocalic-*r*, intrusive-*r* and linking-*r*. The target words chosen varied in terms of the preceding vowels (/ɑ/, /ɔ/, /ɛ/, /ə/, /o/, /u/, /iə/ or /ɑiə/), and /ɹ/ was positioned in both simple and complex codas (see Appendix for the reading list). Within these 50 sentences, there were 35 unique target words intended to elicit the postvocalic-*r*, some of these words repeated in different sentences to maximize the chances of elicitation. There are 63 instances in all for the elicitation of postvocalic-*r*, arriving at a total of 1512 (63*24) tokens for analysis. Half of these target words have the structure V(r), which will be presented in Table 2, and the other half V(r)C, shown in Table 3.

/ɑ/	/ɔ/	/ɛ/	/ə/	/iə/	/aiə/
star (*3)	*soar*	*mare*	*brother* (*2)	*fear*	*dire*
bar	*bore* (*2)	*pair*	*father* (*4)	*mere*	
	pour		*sister* (*2)		
	Singapore		*mother* (*4)		
			later		
			better		
			matter (*16)		
			together		
			sir		
			fur		

Table 2: Target words to elicit postvocalic-*r* with the structure V(r)

/ɑ/	/ɔ/	/ɛ/	/ə/	/iə/	/aiə/
party	*port* (*2)	*fared*	*birds*	*beard*	*fired*
start			*learn*		
park (*2)			*return*		
mars			*word*		
heart			*perfume*		

Table 3: Target words to elicit postvocalic-*r* with the structure V(r)C

The 50 sentences also contained 24 target words that were chosen to elicit intrusive-*r*, arriving at a total of 576 tokens (24*24). The target words chosen varied in terms of the preceding vowels /ɑ/, /ɔ/, /o/, /u/ and /ɑu/. Some of these

target words are nonsense words, as /ɹ/-intrusion is relatively difficult to elicit in spontaneous speech. These words are adapted from Hay and Maclagan (2010), but modified for use in the Singaporean context. Table 4 shows the target words used to elicit the intrusive-*r*.

Base	-ify	-ish	-ing	-y
claw /ɔ/	*clawify*	*clawish*	*clawing*	*clawy*
crow /o/	*crowify*	*crowish*	*crowing*	*crowy*
glue /u/	*gluify*	*gluish*	*gluing*	*gluey*
grandma /ɑ/	*grandma-ify*	*grandma-ish*	*grandma-ing*	–
plough /ɑu/	*ploughify*	*plough-ish*	*plough-ing*	*ploughy*

Table 4: Target words to elicit intrusive-*r*

There are also 7 other sentences in the list that have environments for linking-*r* to occur, and they contain a word with an orthographic ⟨r⟩ preceding *is*, e.g. *mother is, father is, brother is, sister is, Singapore is, fur is, mare is*. The total number of tokens for linking-*r* is 168 (7*24).

Each utterance recorded was given a binary analysis, indicating whether /ɹ/ was produced in the target word or not. For those tokens that were analyzed as containing an intrusive, linking or postvocalic-*r*, acoustic analysis using Praat (http://www.fon.hum.uva.nl/praat) was carried out to confirm the auditory analysis. Acoustically, F3 is the most salient characteristic of /ɹ/, characterized by a dip in the formant. Figures 1 and 2 are examples of where the dip in F3 occurs, confirming the existence of /ɹ/. Figure 1 shows an example of the word *park* produced with a postvocalic-*r*. Figure 2 shows an example of the word *clawing* produced with an intrusive-*r*.

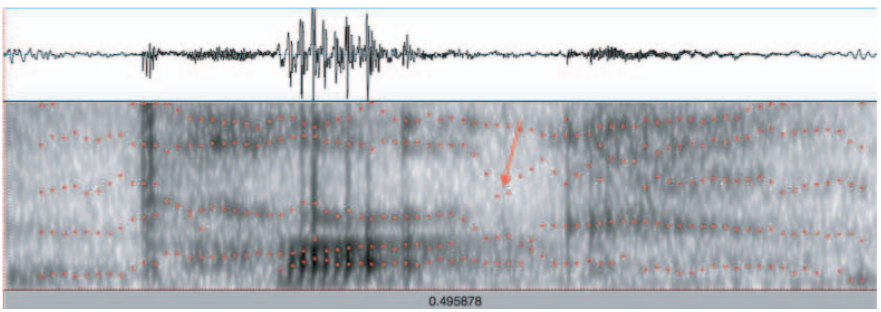

Fig. 1: Utterance of the word *park* produced with postvocalic-*r*, with a vertical dotted line indicating the dip in F3

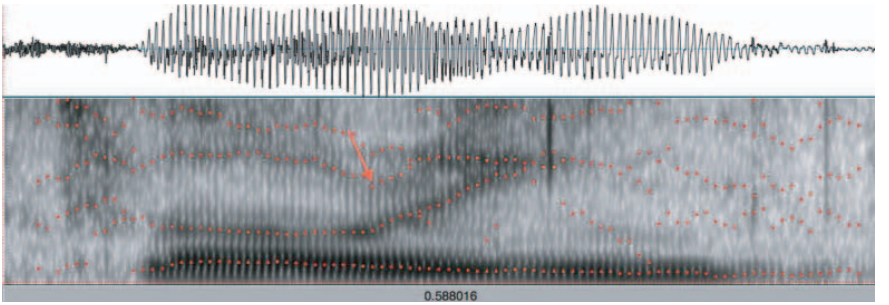

Fig. 2: Utterance of the word *clawing* produced with intrusive-*r*, with a vertical dotted line indicating the dip in F3

The following results section presents, in order, the occurrences of the postvocalic-*r*, intrusive-*r* and linking-*r* by the three groups of speakers. Comparisons across each group of speakers will be done using a one-way ANOVA multivariate test and the Tukey post-hoc test to ascertain if the differences in production of the postvocalic-*r*, intrusive-*r* and linking-*r* across the three groups are statistically significant.

3 Results of /ɹ/ production

There is no clear pattern to the kinds of words that the speakers tend to produce the postvocalic-*r*, intrusive-*r* and linking-*r*. The results in this section will therefore focus only on speaker-specific production of postvocalic-*r*, intrusive-*r* and linking-*r* and its correlation to the speaker's education level and socioeconomic status.

As there are far fewer occurrences of linking-*r* across these three groups of speakers as compared to postvocalic-*r* and intrusive-*r*, the results on linking-*r* will be discussed later. Table 5 shows the percentage of occurrences of only postvocalic-*r* and intrusive-*r* across the three groups of speakers.

In terms of the production of postvocalic-*r* and intrusive-*r*, there seems to be a clear correlation to the speaker's education level and socioeconomic status. The group with the highest education and socioeconomic status – Group H (i.e. the university students) produces the highest percentage of postvocalic-*r*, whereas the other two groups of lower education and socioeconomic status (Groups M and L) produce postvocalic-*r* with much lower frequency.

Five out of 8 Group H speakers produce postvocalic-*r* for more than 50% of the tokens, and 3 of them produce postvocalic-*r* with almost 100% consistency. In

Speaker	H1	H2	H3	H4	H5	H6	H7	H8	Average
Postvoc.-*r*	4.76%	7.94%	0.00%	87.30%	100.00%	96.83%	57.14%	93.65%	55.95%
Intrus.-*r*	4.17%	0.00%	0.00%	8.33%	12.50%	4.17%	0.00%	0.00%	3.50%
Speaker	**M1**	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**Average**
Postvoc.-*r*	22.22%	0.00%	3.17%	1.59%	0.00%	11.11%	22.22%	11.11%	8.93%
Intrus.-*r*	12.50%	0.00%	8.33%	16.67%	16.67%	4.17%	0.00%	0.00%	7.00%
Speaker	**L1**	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**	**L8**	**Average**
Postvoc.-*r*	7.94%	17.46%	9.52%	20.63%	0.00%	3.17%	23.81%	0.00%	10.32%
Intrus.-*r*	25.00%	16.67%	37.50%	16.67%	8.33%	50.00%	25.00%	8.33%	22.50%

Table 5: % of occurrences of postvocalic-*r* and intrusive-*r* across the three groups of speakers

contrast, no speaker from Group M produces postvocalic-*r* in more than 23% of the tokens, and 2 of the Group M speakers do not produce postvocalic-*r* at all. Similarly, Group L speakers produce the postvocalic-*r* with low rates, with only 2 speakers producing postvocalic-*r* in more than 20% of the tokens. On average, Group H speakers have 55.95% of postvocalic-*r*, whereas Group M and Group L speakers only produce 8.93% and 10.32% of postvocalic-*r*, respectively. The difference between Group H to Groups M and L is statistically significant at $p < 0.05$ ($p = 0.001$, $N = 504$, $df = 2$). This seems to suggest that postvocalic-*r* production is directly correlated to high education level and high socioeconomic status. The results seem to corroborate with Labov (1966) on the use of postvocalic-*r* by Americans of high socioeconomic status in New York City.

The occurrences of the intrusive-*r* are generally lower than those of the postvocalic-*r*. However, what is striking is that Group L, the group with the lowest education level and socioeconomic status, produces the highest percentage of intrusive-*r*, whereas the other two groups of higher educational levels and socioeconomic status (Groups M and H) produce intrusive-*r* with much a lower frequency.

Group H speakers, the ones who produce postvocalic-*r*, as we have seen earlier, hardly produce any intrusive-*r*. Only Speaker H5 has more than 10% of intrusive-*r* production, and the rest of the 7 speakers in this group show very few intrusive-*r* occurrences. The incidences of intrusive-*r* increases slightly in Group M speakers, with 3 speakers, namely M1, M4 and M5, showing more than 10% of intrusive-*r* production in their tokens. The numbers increase more dramatically in Group L. 5 out of 8 Group L speakers produce intrusive-*r* in more than 15% of the tokens, and 4 of them produce intrusive-*r* with more than 25% consistency. Speaker L6, in particular, has a 50% rate of producing intrusive-*r*. On average, Group L speakers produce 22.5% of intrusive-*r*, whereas Group M and Group H speakers only produce 7.0% and 3.5% of intrusive-*r*, respectively. The difference between Group L to Groups M and H is statistically significant at $p < 0.05$ ($p = 0.001$, $df = 2$, $N = 192$). The results seem to suggest that intrusive-*r* production is inversely correlated to the speaker's education level and socioeconomic status.

Comparing across speakers, the production of postvocalic-*r* and intrusive-*r* seems to occur in some kind of complementary distribution. The patterns of use tend to fall into three main groups: postvocalic-*r* and not intrusive-*r*; intrusive-*r* and not postvocalic-*r*; or neither postvocalic-*r* nor intrusive-*r*. Except for speaker H5, who has a 100% rate of postvocalic-*r* usage and a relatively high 12.5% rate of intrusive-*r* usage, none of the other high postvocalic-*r* users show high usage of intrusive-*r*. This could possibly be due to self-consciousness or hypercorrection such that the /ɹ/ needs to be inserted at every possible point, postvocalic or not.

As Speaker H5 is only one speaker out of the entire group, she can be seen as an anomaly more than the norm.

Users of intrusive-*r* similarly show relatively low usage of postvocalic-*r*, though the pattern is not as clear as that seen in Group H speakers. Speakers L1, L3 and L6 show more than 25% occurrences of intrusive-*r* (a relatively high number in comparison to the rest), and can be considered to be high users of intrusive-*r*. Their use of postvocalic-*r* is considerably lower, with less than 10% usage. Speakers L2 and L7 do fall out of the predicted norm, as they use both the postvocalic-*r* and intrusive-*r* almost equally. However, in both cases, their use of postvocalic-*r* is relatively low, at 17% and 24% respectively, and this could be a sign of inconsistent usage. And finally, Group M speakers can be said to be perhaps the most consistent group of speakers as compared to the other two groups. Across the board, they have low occurrences of both the postvocalic-*r* and intrusive-*r*. They may perhaps be seen to be the group that represents the "default", average Singaporean. If that were the case, then perhaps /ɹ/, intrusively or postvocalically, is not a feature common to the average SgE speaker.

As for linking-*r*, the occurrences are negligible. All three groups produce linking-*r* rarely, with percentages of occurrence for each group at close to 0%. The differences, as expected, are also statistically not significant. Out of a possible 168 instances for linking-*r* to occur, only 3 speakers out of the 24 speakers produce them, and they are Speakers H5 (twice), M1 (once) and M8 (once). One of the reasons for why there are fewer occurrences of linking-*r* could be due to the relatively smaller number of tokens available for analysis, as compared to the larger numbers for postvocalic-*r* and intrusive-*r*. Despite the small number, the fact that the occurrences are so rare does confirm earlier observations by Tay (1982) and Brown (1988) that linking-*r* is not commonly found in SgE.

The fact that linking-*r* is not found in SgE while the intrusive-*r* is, seems to go against the assumptions of phonological theories (see Hay and Sudbury [2005: 799–801] for an extensive discussion) and the distribution of /ɹ/-sandhi across dialects of English. In brief, most phonological theorists take both the linking-*r* and intrusive-*r* to be the same phenomenon, and their appearances or lack thereof can be explained by phonological rules that assume their existence on the phonemic level. The linking-*r* and intrusive-*r* are claimed to have arisen from the same phonological process and are distinct "only historically and orthographically" (Wells 1982: 223). As mentioned earlier in the paper, /ɹ/-sandhi typically appears in non-rhotic varieties of English. Most varieties that exhibit linking-*r* will also exhibit intrusive-*r*. However, there are instances where a dialect exhibits linking-*r* and not intrusive-*r*. Wells (1982) for example highlighted how some RP speakers use linking-*r* without using intrusive-*r*, presumably be-

cause of their strong knowledge of orthography. In general, linking-*r* occurs at a higher rate as compared to intrusive-*r* as the latter may be associated with a certain amount of stigmatization (Hay and Sudbury 2005: 801). However, there has not been, in the literature, any documentation of a variety of English that exhibits intrusive-*r* without linking-*r*. The results here suggest the possibility that SgE may be one, and might point to a different phonological process working on the linking-*r* and intrusive-*r*, in which case the idea of /ɹ/-sandhi and the theories underpinning it need to be revised to account for it. However, until more data is available to show that linking-*r* does not occur in SgE regardless of phonological environments, the idea that SgE is a counter-example to theories accounting for /ɹ/-sandhi is not likely to hold. More likely, the use of intrusive-*r* and lack of use of linking-*r* in SgE is socially rather than phonologically conditioned. What the social conditions are exactly, this paper cannot claim to have the answer, but it does open up questions for further research in the future. And if indeed the use of the different *r*-s in SgE is socially conditioned, the evidence will show itself in the perception and attitudes of speakers towards the different *r*-s. For now therefore, what remain to be answered are: how do SgE speakers perceive the use of postvocalic-*r* and intrusive-*r*? What kinds of impressions do Singaporeans have toward users of postvocalic-*r* and intrusive-*r*? The next section describes the attitudes test that was developed and administered in an attempt to answer those questions.

4 Attitudes to /ɹ/

As mentioned earlier, one of the research questions that this paper seeks to answer is to determine the attitudes of SgE speakers to the use of postvocalic-*r* and intrusive-*r* in SgE. A perception test was designed and carried out for this task. Since, as mentioned earlier, the linking-*r* occurs less frequently, it has been left out of the perception test. Fifty undergraduates at the author's university were played 12 utterances, selected from the recordings done earlier. Four utterances had the postvocalic-*r*; 4 had the intrusive-*r* and the other 4 utterances had neither instances of intrusive-*r* nor postvocalic-*r,* to be referred to as *r*(0). For each utterance, the participant was asked four questions. The questions were meant to elicit the attitudes towards the speaker of the utterance in terms of status and solidarity dimensions (Cavallaro and Ng 2009). Traits associated with the status dimension are intelligence and education. The solidarity dimension, on the other hand, focuses on features such naturalness and likeability. The following are the four questions, and the corresponding options the respondents have to the questions:

(1) Do you think this speaker sounds natural?	Yes or No
(2) Do you think this speaker sounds intelligent?	Yes or No
(3) Do you think this speaker sounds likeable?	Yes or No
(4) What level of education do you think this speaker has?	ITE or below, Polytechnic or University

The attitudes test was limited to no more than 10 minutes for fear of participant fatigue. The following subsection presents the results of the attitudes test.

4.1 To r or not to r?

4.1.1 Naturalness

The presence or absence of *r* has no major effect on the perceived naturalness of the speaker, with most of the utterances judged to be sounding authentic, local and natural. Table 6 shows the judgments of the informants with regard to the question on perceived naturalness of the speakers.

	Postvocalic-*r*	**Intrusive-*r***	***r*(0)**
Natural	67.5%	56.0%	76.5%
Not natural	32.5%	44.0%	23.5%

Table 6: Judgments of naturalness to the use of the postvocalic-*r*, intrusive-*r* and *r*(0)

On the whole, it can be noted that the speakers who do not produce postvocalic-*r* and intrusive-*r* are perceived to be most natural-sounding. 76.5% of the informants prefer speakers with *r*(0) as compared to 67.5% for postvocalic-*r* and 56.0% for intrusive-*r*. While there is no significant difference between the perceived "naturalness" of the postvocalic-*r* and *r*(0), the judgments of naturalness to the use of intrusive-*r* is found to be significantly different from that of the postvocalic-*r* at $p < 0.05$ ($p = 0.04$) and that of *r*(0) at $p < 0.05$ ($p = 0.001$, $df = 2$, $N = 600$). This suggests that the intrusive-*r* is perhaps most "foreign" or "alien" to Singaporeans and therefore perceived to sound most unnatural. This could also be a sign of stigmatization for speakers who produce intrusive-*r*. The informants are all university students, and may possibly view intrusive-*r* users as bad English speakers, especially since, as shown earlier, university students do not tend to produce much intrusive-*r* themselves.

It is interesting to note that the informants do not view speakers who use the postvocalic-*r* too negatively in terms of naturalness. As Poedjoesodarmo (2000)

and Tan and Gupta (1992) observed, the use of postvocalic-*r* in SgE is most likely due to the influence of the American media. If the use of postvocalic-*r* were to mimic what is shown in the media, then one would assume that SgE speakers who use postvocalic-*r* would be perceived as being pretentious, and therefore unnatural. The results here show otherwise. This is likely due to the fact that the informants, being university undergraduates, fall under the group that is most likely to be using the postvocalic-*r* themselves. But more importantly, this could be a sign that the postvocalic-*r* is in the process of being adopted as a part of the phonological inventory of SgE to the extent that its use is no longer considered unusual or unnatural.

4.1.2 Likeability

Table 7 shows the judgments of the informants with regard to the question on likeability of the speakers.

	Postvocalic *r*	**Intrusive *r***	***r*(0)**
Likeable	61.0%	9.0%	51.5%
Not likeable	39.0%	91.0%	48.5%

Table 7: Judgments of likeability of speakers' use of the postvocalic-*r*, intrusive-*r* and *r*(0)

An overwhelming 91% of the respondents find speakers with the intrusive-*r* unlikeable. This points very clearly to the stigma attached to speakers who use intrusive-*r* in SgE. Corresponding to what was discussed earlier on the naturalness rating of speakers who use the postvocalic-*r*, the results here suggest that the postvocalic-*r* has gained acceptance in SgE. 61% of the participants find the use of postvocalic-*r* desirable, as they find speakers who use the postvocalic-*r* to be likeable. In fact, the postvocalic-*r* may in fact be preferred, as only about 50% of the informants find speakers of *r*(0) to be likeable. While there is no significant difference between the likeability of speakers of postvocalic-*r* and *r*(0), the likeability ratings of the speaker of the intrusive-*r* is found to be significantly different to that of the postvocalic-*r* at $p < 0.05$ ($p = 0.001$) and that of *r*(0) at $p < 0.05$ ($p = 0.001$, $df = 2$, $N = 600$).

4.1.3 Intelligence

The two above questions on the solidarity dimension are veered positively toward users of postvocalic-*r* and negatively towards users of intrusive-*r*. The perception

of intelligence is one of the two questions on the status dimension. Table 8 shows the judgments of the informants with regard to the question on the perceived intelligence of the speakers.

	Postvocalic *r*	Intrusive *r*	*r*(0)
Intelligent	76.0%	23.0%	61.5%
Not intelligent	24.0%	77.0%	38.5%

Table 8: Judgments of intelligence to the use of the postvocalic-*r*, intrusive-*r* and *r*(0)

76% of the informants feel that speakers who use the postvocalic-*r* are intelligent, as compared to speakers who do not, with only 61.5% of the informants judging *r*(0) to be intelligent. This difference is significant at $p < 0.05$ ($p = 0.001$, $df = 2$, $N = 600$). This is consistent to what was shown earlier. The positive feelings towards users of postvocalic-*r* are not restricted only on the solidarity dimension, but are extended to the status dimension. Since the informants are all university students, and especially since, as shown earlier, university students do tend to produce postvocalic-*r* themselves, it is quite likely that their positive association to the intelligence of the postvocalic-*r* users in the stimuli stem from this.

What is even more striking is that 77% of the informants perceive speakers who produce the intrusive-*r* to be unintelligent, and this difference is statistically significant at $p < 0.05$ ($p = 0.001$, $df = 2$, $N = 600$). Similar to what was observed earlier, this is a clear sign that there is a stigma attached to intrusive-*r* usage.

4.1.4 Education

The informants, in this question, were given an option to attach one of the three educational levels – university, polytechnic and the ITE – to the stimulus speakers. The results are consistent to what was discussed earlier. Table 9 shows the judgments of the informants with regard to the question on the education level of the speakers.

	Postvocalic *r*	Intrusive *r*	*r*(0)
University	71.5%	0.0%	47.5%
Polytechnic	23.5%	44.0%	43.0%
ITE & below	5.0%	56.0%	9.5%

Table 9: Judgments of education level to the use of the postvocalic-*r*, intrusive-*r* and *r*(0)

Users of *r*(0) are clearly split between the two highest educational bands, with an average of 45% of respondents for each band. This suggests that the informants do not have any strong positive or negative associations toward the users of *r*(0). The results for the perceived education level of postvocalic-*r* and intrusive-*r* users however show much larger contrasts.

More than 70% of the informants believe that speakers using postvocalic-*r* are university-educated, and 23.5% of the informants placed postvocalic-*r* speakers in the polytechnic category. Only 5% of the informants believe that postvocalic-*r* speakers are at the lowest educational band, suggesting that postvocalic-*r* is strongly associated with higher education.

What is most striking is that all the informants unanimously feel that speakers who use intrusive-*r* have no university education. At the same time, more than 50% of the informants believe that users of intrusive-*r* must belong to the lowest educational band. This kind of stark contrast points very clearly to the perception of postvocalic-*r* use and intrusive-*r* use. Intrusive-*r* users are clearly stigmatized and believed to be poor academic achievers.

All the results point consistently to positive attitudes towards postvocalic-*r*, and negative attitudes to intrusive-*r*. It does seem that for one to be judged favorably in Singapore, it would be best to produce *r* in a postvocalic position, and if one is not able to and decides not to, then it is better not to *r* at all than to produce an intrusive-*r*.

5 Discussion and conclusion

This paper began by asking if speakers of SgE use postvocalic-*r*, linking-*r* and intrusive-*r*, and if so who the speakers are, and also if there is a correlation between the speakers' educational level and socioeconomic status to the use of the different /ɹ/. The results show that there is a direct correlation between education level and socioeconomic status of the speaker and the production of postvocalic-*r* and intrusive-*r* in SgE. Speakers of higher education levels and socioeconomic status have a tendency to produce the postvocalic-*r*, and speakers of low education levels and socioeconomic status have a tendency to produce the intrusive-*r*. This confirms Tan and Gupta's (1992) observations that the use of postvocalic-*r* is associated with, in their words, "high prestige", though in this case, one can go further and assert that the use of postvocalic-*r* is directly correlated to education level and socioeconomic status, which explains precisely why it can be seen as a prestige marker. The use of intrusive-*r* is perhaps not simply due to hypercorrection or the instability of the /ɹ/, as Tan and Gupta also claimed. Rather, because the intrusive-*r* and postvocalic-*r* are in complementary distribution and are used

by speakers on the opposite ends of education level and socioeconomic status, the intrusive-*r* is in itself a social class marker.

It is highly possible that the use of postvocalic-*r* in SgE is due to the speakers' increased exposure to American media, as suggested also by Tan and Gupta (1992) and Poedjosoedarmo (2000). The fact that the use of postvocalic-*r* is restricted to university students with higher socioeconomic backgrounds bears stronger evidence to the influence of American English. While the American music and movie industry has a strong foothold in Singapore, the Group H speakers have a higher chance of exposure for a few reasons. Firstly, their main home language is English, as compared to the Group M speakers whose home language is Mandarin and Group L speakers whose home language is a Chinese "dialect". One can assume that Group H speakers are most likely to be entertained by English TV programs and English pop music, and therefore have much higher exposure to the English-language media, which is highly Americanized in Singapore. Group M and Group L speakers, on the other hand, are likely to be more at home with the mainstream non-English media, of which Taiwanese and Hong Kong pop culture has a strong influence. Group H speakers, being in university, are also more likely to be in contact with professors and students from the US, with increased exchange opportunities, especially between Singapore and the US. In fact, while analyzing the recordings of the speakers, it was observed that users of postvocalic-*r* have also adopted American features such as taps in words like *later* and *matter*. The question of how far SgE speakers are going in adopting American English features in SgE is one for future research.

There is no doubt that the intrusive-*r*, like the postvocalic-*r,* is a sociolinguistic variable motivated by social factors. Foulkes' (1997) study on /ɹ/-sandhi in Newcastle showed that there were clear age and class differences in the use of intrusive-*r* and linking-*r*, suggesting that /ɹ/-sandhi is socially conditioned. Hay and Maclagan's (2010) study on New Zealand English found intrusive-*r* to be a sociolinguistic variant, and that the occurrences of intrusive-*r* are more common in speakers of lower socioeconomic status. This is exactly what is found here, and perhaps does suggest a commonality in dialects of English across the world. However, in the case of SgE, while one can attribute the use of postvocalic-*r* to American influences, where does the intrusive-*r* come from, and why is it restricted to Group L users? In New Zealand English, both the linking-*r* and intrusive-*r* emerged when New Zealand English was losing its rhoticity (Hay and Sudbury 2005). This can be said to be a naturally occurring phonological process. In the case of SgE however, the intrusive-*r* appears without the linking-*r*. It is unlikely therefore that the intrusive-*r* in SgE is phonologically conditioned. If the intrusive-*r* is motivated by a phonological process in SgE, then one would expect the linking-*r* to be occurring, and most likely in the same group of speakers. The fact that linking-*r* is not

commonly found in SgE while the intrusive-*r* is, seems to go against the assumptions of phonological theories and the distribution of /ɹ/-sandhi across dialects of English. However, without historical data, it is difficult to pin down when and how the intrusive-*r* made its appearance in SgE, and if it is an innovation in SgE or if it has always been latent in the language, waiting to be uncovered. The most plausible explanation one can offer for now, without the benefit of more concrete evidence, is that Group H and Group M users are perhaps more careful in their speech and more aware of orthography, which in turn make them more unlikely to insert an /ɹ/ where orthographically they know there should not be one. This explains the lower frequency of intrusive-*r* occurrence in Group H and Group M speakers, as compared to Group L speakers. It is perhaps because of this that the intrusive-*r* users may be perceived to be speakers of "bad" English in Singapore, which explains the stigma attached to these speakers.

The attitudes test carried out in the second part of this study attests strongly to the stigmatization of intrusive-*r* users. Postvocalic-*r* users rank very highly in terms of naturalness, likeability, intelligence and education. Intrusive-*r* speakers on the other hand are perceived to be foreign, undesirable, unintelligent and have low education levels. This match between production and perception is significant, as it shows that social categorization is not only encoded in the users of the different /ɹ/, but further strengthened by the attitudes and perceptions of speakers of the language. Of course, in a negative way, this serves to promote stereotypes and creates an unhealthy cycle to which intrusive-*r* users will only be further stigmatized. However, the results of the attitudes test only go to show that the postvocalic-*r* and intrusive-*r* are not simply concrete, categorical phonological processes, but are considerably influenced by social factors. Has SgE become fully rhotic then, one might ask? Not quite yet, if postvocalic-*r* use, at present, is restricted to only an "elite" group of speakers. However, this elitism may well push SgE on its way to becoming a rhotic variety if speakers decide that it is better to *r* than not to *r* – postvocalic-*r*, that is.

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Appendix: Speaker's reading list

1. I am reading a list of sentences.
2. This will be very interesting.
3. Can I have a word with you?
4. He has some glue.
5. My sister fared well from the start.
6. He is clawing through this.
7. Can I pour you some port?
8. He is crowing about this matter.
9. Can you return the perfume?
10. He is crowy about this matter.
11. He is gluey about this matter.
12. This is my greatest fear.
13. He is gluing some things together.
14. He is going to claw through this.
15. He is going to crow about this matter.
16. My father loves my mother.
17. He is going to plough through this.
18. My grandma is a bore.
19. He is ploughing through this.
20. My brother is a bore.
21. He would like to clawify this matter.
22. I love his beard.
23. He would like to gluify this matter.
24. Look ma, no hands!
25. My brother is at the party.
26. He is crowish about this matter.

27. No sir, this is not my heart.
28. He is gluish about this matter.
29. My father fired the star employee.
30. He is ploughy about this matter.
31. My father loves the park.
32. He would like to ploughify this matter.
33. My father will go to the park later.
34. He would like to crowify this matter.
35. My mother is eating a Mars bar.
36. He is clawish about this matter.
37. My mother likes this star better.
38. He is ploughish about this matter.
39. My mother loves this pair of shoes.
40. She is grandmaing about this matter.
41. He is clawy about this matter.
42. My sister is in a dire situation.
43. She is a mere star.
44. She is grandmaish about this matter.
45. Singapore is a port.
46. The birds soar in the sky.
47. The fur is beautiful.
48. She would like to grandmaify this matter.
49. The mare is beautiful.
50. You learn well.