

Mandarin Rhotacization: A Sociolinguistic Study of Young Urban Speakers in Beijing and Other Regions of China

Zhiyu Yan and Myra Xie

Department of Linguistics, McGill University
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Professor Charles Boberg

Abstract

Rhotacization (*erhua*) is a salient phonological feature of Beijing Mandarin and a well-known marker of regional identity in China, especially among male speakers. However, the distribution of this feature among younger Mandarin speakers, notably in large cities, somewhat differs from the distribution described in previous studies. This study investigates the effects of region and gender on *erhua* usage among urban Mandarin speakers born in the 2000s, recruiting participants from Beijing and other major Chinese cities, evenly divided by gender. Through a quantitative comparison across groups and styles in performing reading tasks, the results show a robust regional effect: Beijing speakers use *erhua* at significantly higher rates than non-Beijing speakers. Beijing speakers also display substantially greater individual variation, likely reflecting the city's sociolinguistic heterogeneity. In contrast, no statistically significant gender difference was found. However, descriptive patterns suggest that Beijing men may reduce rhotacization more sharply in formal contexts than women, indicating possible gendered style shifting. These findings highlight the continued importance of regional background in shaping *erhua* usage while suggesting a potential weakening of traditional gender-based differences among younger urban speakers.

1 Introduction

Rhotacization in Mandarin, often known as *erhua*, is a phonetic and phonological phenomenon in which certain syllables become r-colored, typically transcribed as [ə̞] or [ɿ]. While *erhua* occurs in many Mandarin dialects, it is particularly prominent in Beijing Mandarin, which serves as the foundation for Modern Standard Chinese. However, the distinction between the standard language and the Beijing dialect is somewhat arbitrary and has long been a topic of debate; certain features of Beijing Mandarin, including *erhua*, are generally not considered part of Modern Standard Chinese (Chen 1999: 37).

Even within Beijing Mandarin, *erhua* exhibits a high degree of free variation. Many words commonly occur in their rhotacized form, yet their unrhotacized counterparts are also acceptable and frequently observed (Chen 1999: 39):

- *huā* [xwa] or *huār* [xwaə̃] ‘flower’
- *pén* [pʰən] or *pénr* [pʰə̃] ‘basin’

The acceptability of *erhua* in Beijing Mandarin varies on a gradient scale. Unlike r-coloring in English, whose distribution is mainly phonological, *erhua* in Mandarin is closely associated to the specific lexicon. Depending on the specific word, rhotacization can either be obligatory, optional, or forbidden (Zhao 2017: 207). This variation provides ground for lexical contrasts, where rhotacization differentiates meanings between words (Chen 1999, 39):

- *huǒxīng* [xwoɕiŋ] ‘Mars’ vs. *huǒxīngr* [xwoɕiə̃] ‘spark’
- *xìn* [ɕiŋ] ‘letter’ vs. *xìnr* [ɕiə̃] ‘message’

Such distinctions are generally lost in Modern Standard Chinese, where all the words above would be pronounced without rhotacization.

The sociolinguistic status of *erhua* in China remains complex. It is a salient feature of Beijing Mandarin and a strong marker of local identity, yet it is also perceived as a stereotype of Beijing speech, as it is avoided in formal speech and attracts overt social commentary by Beijing and non-Beijing speakers (Zhao 2017: 51). A 2005 study on Chinese professionals in Beijing found that female employees in foreign companies used significantly less rhotacization than their male colleagues, whereas this difference was not observed among professionals in state-owned companies (Zhang 2005: 447). Another study on university students in Beijing revealed that men and students with low aspirations used 15% more *erhua* than women and students with high aspirations (Zhao 2017, 212-214). Beyond the capital, research on young men from Zhengzhou, Henan, indicated that extroverts tend to use more rhotacization, as it is associated with masculinity (Pankhurst 2012: 38).

This study focuses on a specific speech community: urban Mandarin speakers in China, particularly young adults born in the 2000s. This population generally has a native or near-native proficiency in Standard Mandarin through mass media, education, and language assimilation policies. In major urban centers such as Beijing and Shanghai, mass migration in recent decades may have also influenced local language patterns, reducing regional features and encouraging a shift toward Standard Mandarin (Zhang 2018: 74-75).

In our research, we are looking at the performance of male and female speakers from Beijing and other cities. Based on previous research, we hypothesize that *erhua* usage will vary based on both region

and gender: (1) speakers from Beijing will use *erhua* more frequently than speakers from other cities, and (2) male speakers will use *erhua* more frequently than female speakers.

2 Methodology

Our research included speech samples from two groups: 20 speakers from Beijing and 20 speakers from other Chinese cities. Each group was evenly divided into 10 male and 10 female speakers. Non-Beijing participants were carefully selected to ensure a balanced representation of China’s major Chinese-speaking regions. To recruit participants, we contacted friends and acquaintances to participate in the research and asked a few of them to reach out to their own friends for participation. Most of this outreach occurred on social media, with some interactions taking place in person. We chose not to upload our survey online to maintain better control over participant backgrounds. Our participants were mainly university students, and all had completed at least high school. Most of the participants belonged to the middle class, but this was not a strict classification and is not a major focus of this study.

To qualify for participation, individuals had to meet the following criteria:

1. Fluency in Standard Mandarin. This applied to all members of the target speech community; we did not encounter anyone who did not meet this criterion.
2. Born in the 2000s. Since we were looking for adult participants, only individuals born between 2000 and 2006 were eligible. We successfully recruited a range of participants born between 2002 and 2006.
3. Have lived in a single city for most of their first 18 years. Participants were not required to have remained in the same city throughout their youth, but they had to be able to identify one city that best represented their background. We also used this information to select participants by region, as shown in Table 1.

Region	Northeast	Central N	East	Central S	Southwest	South
Male	1	2	2	1	2	2
Female	1	2	2	1	2	2

Table 1: Non-Beijing participants by specific region

Each participant received a survey to verify their demographic background (gender, year of birth, and city) and completed two tasks. Task 1 consisted of a short Chinese passage that we composed, which

contained 55 words that could potentially undergo rhotacization. Participants were asked to record themselves reading the passage in a natural, conversational tone. Task 2 featured a list of 50 words that could be rhotacized, and participants were also asked to read and record it. The two tasks featured the same syllable targets, most of which belonged to the same word in both tasks. However, a few words in Task 2 were deliberately made different from their Task 1 counterparts to avoid excessive repetition (e.g. 公园 in Task 1 vs. 动物园 in Task 2). Certain words appeared multiple times in the passage (hence 55 targets rather than 50), allowing us to cover the rhotacization of the same word across different linguistic environments.

We collected information on gender (male/female) and region (city name) through demographic questions in the survey. To analyze *erhua* usage, we listened to the audio recordings and coded each possible instance of *erhua*: a score of 1 was assigned for presence and 0 for absence. While most cases could be identified impressionistically, some utterances were difficult to decipher due to fast speech. In such cases, we turned to secondary phonetic evidence:

- Coda deletion (e.g., *hái* [xai] vs. *hái*r [xaə]; *jìng* [tɕɿŋ] vs. *jìng*r [tɕjə̌]). The absence of [i] and [ŋ] is sufficient to indicate *erhua*.
- Blocking of raising (e.g., *diǎn* [tjɛn] vs. *diǎn*r [tjaə]; *yuán* [ɥɛn] vs. *yuán*r [ɥaə]). The vowel /a/ in rhymes /jan/ and /ɥan/ rise to /ɛ/. However, *erhua* causes deletion of the coda /n/, destroying this rhyme and thus blocking raising.

If the target syllable was strongly reduced, it was marked as absent (0). If a participant misread a word, such as through substituting it with a synonym or skipping part of the phrase, the word was excluded from the data. However, if a participant avoided rhotacization by adding suffixes (e.g. *xiǎohái* vs. *xiǎoháizi*, *lǎotóu* vs. *lǎotóuzi*), this was not considered as a misreading but rather a morphological strategy to produce natural speech without *erhua*. In such cases, the *erhua* of the word was also marked as absent.

Once all data was encoded, we calculated each participant's individual frequency of *erhua* usage for both tasks.

3 Results

Region	Beijing		Non-Beijing	
style	reading style	word list	reading style	word list
average (%)	54.55	45.2	13.88	14.2
standard deviation	24.14	30.99	13.93	13.78

Table 2: Regional variation in *erhua* frequency

Gender	Male		Female	
	reading style	word list	reading style	word list
style				
average (%)	31.24	29.98	37.18	27.02
standard deviation	24	27.98	35.4	28.36

Table 3: Gender variation in *erhua* frequency

Region/Gender	Beijing		Non-Beijing	
	reading style	word list	reading style	word list
Male avg. (%)	49.27	35	13.21	13
Female avg. (%)	59.82	55.4	14.55	15.4
Male std. dev.	30.01	34.18	16.56	14.7
Female std. dev.	16.36	24.05	11.59	13.47

Table 4: Detailed variation in *erhua* frequency based on both region and gender

4 Discussion

We begin by examining the first variable: region. As shown in Table 2, speakers from Beijing exhibit an average *erhua* frequency of 54.55% in the reading style and 54.2% in the word list. In contrast, speakers from other cities show a markedly lower average frequency of 13.88% in the reading style and 14.2% in the word list. A *t*-test on the reading style results yields a *p*-value of 0.000000152, significantly smaller than any conventional significance level. This data strongly supports the conclusion that Beijing speakers use *erhua* at a significantly higher frequency than non-Beijing speakers. This finding aligns with the known distribution of *erhua* in China, where its usage is most prominent in Beijing and less frequent in other regions.

Furthermore, the usage of *erhua* differs in non-Beijing areas. After sorting non-Beijing participants by specific regions in Table 5, we observe a skewed distribution where the *erhua* frequencies from northern China (Northeast, Central North) is higher than their southern counterparts:

Region	Northeast	Central N	East	Central S	Southwest	South
reading style	36.95	27.27	7.27	13.64	6.36	3.18
word list	47	22.5	7	5	9.5	6

Table 5 : *Erhua* frequency by specific region

While the limited sample size prevents us from drawing definitive conclusions about broader regional variation, this north-south divide in *erhua* usage is worth further investigation. A possible account for this result is the influence of local Chinese varieties of each region. As a linguistic feature, *erhua* is exhibited in most northern dialects and a few southern dialects, specifically the southwest and Wu-speaking regions in eastern China (Cao 2008, Map 052). However, from our results, speakers from the east and the southwest have a low frequency of using *erhua*. A possible explanation lies in the the quality of *erhua* of these regions: *erhua* in northern Chinese varieties is commonly realized as rhotacization, similar to *erhua* in Beijing. In comparison, *erhua* surfaces as a rhotic or lateral suffix in the southwest and takes the form of a nasal coda in Wu Chinese (Cao 2008, Map 052). Such realizations are considerably more different from the *erhua* in Beijing Mandarin, and therefore might not be adopted by southern speakers when speaking standard Mandarin.

The variability in *erhua* usage also differs between the two groups. Among Beijing speakers, the standard deviation is 24.14% in the reading style and 30.99% in the word list, whereas for non-Beijing speakers, it is 13.93% and 13.78% respectively, as shown in Table 2. An F-test on the reading style data produces a p-value of 0.0209, which is below the significance level of 0.05, confirming that Beijing speakers exhibit more significant variation in *erhua* usage than non-Beijing speakers.

A key factor contributing to this variation may be that non-Beijing speakers tend to use very little *erhua* overall, with their average frequency being only around 14%. Nonetheless, since they come from diverse regions across China, one might expect more variation among them than among Beijing speakers, who represent a single city. Interestingly, we observed the opposite trend: *erhua* variation is greater among Beijing speakers, likely due to the city's sociolinguistic complexity. As a major metropolis, Beijing has absorbed migrants from across China, leading to linguistic diversity within its speech community. While the children of migrants in Beijing generally assimilate to the local dialect, variation still remains, particularly in highly variable features such as *erhua* (Dong 2009: 118; Zhang 2018: 64-68). Therefore, this variation could be explained by the variation in regional backgrounds of Beijing speakers. To confirm this explanation, however, further research should collect information on family background, such as the place of origin of the speakers' parents.

The second variable under investigation is gender. In Table 3, male participants exhibit an average *erhua* frequency of 31.24% in the reading style and 24% in the word list, while female participants show higher averages of 37.18% and 35.4%, respectively. However, *t*-tests indicate no statistically significant difference between the two groups.

Several factors might explain this result. First, the sample size may be insufficient to detect a gender-based difference. Previous studies have shown that gender differences in speech are not always evident and sometimes involve only a small margin, such as the 15% difference in Zhao's (2017: 213) study on university students. A larger sample might be necessary to confirm any potential differences. Another possibility is that gender-based variation in *erhua* usage is diminishing within our target speech community. Research on other features of Beijing Mandarin, such as neutral tone, classifier omission, and the intensifier *te*, suggests that long-term promotion of Standard Mandarin and the lack of prescriptive differences between Beijing Mandarin and Standard Mandarin may be contributing to the gradual loss of gender-based speech differences (Zhao 2022, 141).

Interestingly, rather than supporting the expectation that men use more *erhua*, our data actually suggests the opposite: women may have higher *erhua* usage than men. While the difference is not statistically significant, female participants consistently exhibit higher *erhua* frequency in both tasks. A possible explanation is style shifting; that is, men might be reducing their *erhua* usage more consciously in the two tasks.

Comparing the change from reading style to word lists, male participants reduced their *erhua* frequency by 7.24%, whereas female participants only reduced theirs by 1.78%. This effect is even more significant among Beijing speakers: based on data in Table 4, Beijing men reduced their *erhua* usage by 14.27%, while Beijing women reduced theirs by only 4.42%.

As suggested by previous studies, *erhua* is perceived as a stereotype of Beijing speech, which might have a stronger effect on men since it is also associated with masculinity. This perception may lead Beijing men to reduce their rhotacization in formal contexts such as reading passages and word lists, where they might perceive it as less appropriate. However, the degree of style shifting likely varies between individuals. Indeed, male Beijing participants exhibit greater variability in *erhua* usage than their female counterparts: in reading style, the standard deviation is 30.01% for men and 16.36% for women; in word lists, variability increases for both groups, with 34.18% for men and 24.05% for women (Table 4).

This suggests that some male speakers significantly reduce their *erhua* usage in formal contexts while others do not, leading to greater overall variation. In contrast, female participants exhibit more consistent behavior across tasks. However, to confirm this style-shifting hypothesis, future research would need data from casual and careful speech contexts to better capture potential changes in *erhua* across different speech styles.

Overall, style shifting is not highly significant. Across all participants, the average *erhua* frequency is 34.21% in reading style and 29.7% in word lists. However, as suggested previously, this does not imply that all participants maintain a consistent level of *erhua* usage between the two tasks.

Shift type	Sharp decrease	Mild decrease	Consistent	Increase
Range	-15% & lower	-15% ~ -5%	-5% ~ +5%	+5% & higher
Participants	6	7	20	7

Table 6 : Shift in *erhua* frequency between styles

This relates back to individual variation in style shifting: speakers exhibit different motivations and tendencies when adjusting their *erhua* frequency. Some reduce it in more formal contexts, others reinforce it, and some remain largely consistent across tasks.

5 Conclusion

This study examined *erhua* usage among young urban Mandarin speakers, focusing on region and gender. The results confirm that Beijing speakers use *erhua* significantly more than non-Beijing speakers. Beijing speakers also showed greater individual variation, likely due to the city's linguistic diversity. Non-Beijing speakers, on the other hand, had less variation but still exhibited regional differences. Gender differences were not statistically significant. Nonetheless, it appears that Beijing men have a stronger tendency to reduce *erhua* in formal contexts. Style shifting was minimal overall and varied by individual. These findings suggest that regional identity remains a key factor in *erhua* usage, while gender differences may be decreasing due to changing social norms. Future research should further explore other speech styles, namely casual speech and careful speech. Regional backgrounds of speakers could be investigated to study *erhua* variation in Beijing, while larger samples should be collected to study gender-based differences.

References

- Cao, Zhiyun. (ed.). 2008. *Linguistic atlas of Chinese dialects*, vol. 3. Beijing: The Commercial Press.
- Chen, Ping. 2012. *Modern Chinese: history and sociolinguistics*. Cambridge: Cambridge University Press. doi:10.1017/CBO9781139164375
- Dong, Jie. 2009. 'Isn't it enough to be a Chinese speaker': Language ideology and migrant identity construction in a public primary school in Beijing. *Language & Communication* 29. 115-126. doi: 10.1016/j.langcom.2009.01.002
- Pankhurst, Matthew. 2012. Rhotic lenition as a marker of a dominant character type in northern Mandarin Chinese. *Working Papers of the Linguistics Circle of the University of Victoria* 22(1). 27-40.
- Zhang, Qing. 2005. A Chinese yuppie in Beijing: Phonological variation and the construction of a new professional identity. *Language in Society* 34(3). 431-466. doi: 10.1017/S0047404505050153
- Zhang, Qing. 2018. *Language and Social Change in China: Undoing Commonness through Cosmopolitan Mandarin*. New York and London: Routledge. <https://doi.org/10.4324/9781315886251>
- Zhao, Hui. 2017. *Language variation and social identity in Beijing*. London: Queen Mary University of London PhD Dissertation.
- Zhao, Hui. 2022. 6 Social meaning and variation in perception: Beijingers' attitudes towards Beijing Mandarin. In McLelland, Nicola & Hui Zhao (eds.), *Language standardisation and language variation in multilingual contexts: Asian perspectives*, 128-146. Bristol, Blue Ridge Summit: Multilingual Matters. doi: 10.21832/9781800411562-009

Appendix A

Task 1. Characters with emphasis marks represent specific syllable targets.

过了这么多年，我终于回了一趟老家。在老家的最后几天，我给很久没联系的浩文发了微信，和他约在小区旁边的公园见面。从公园大门进去之后，我找了个长椅坐下。道路两边的树木开了很多花，长椅上全是落下来的花瓣。不远处的几个小孩在一起玩跳绳。

浩文过了一会才过来。他穿了一件灰色的 T 恤，还戴着眼镜，跟以前的他看起来有点不一样。我不免回想起小时候，我们在学校后院一起玩的那段时光。

我上前招呼他过来。“哎呀，这都多少年没见了。”他热情地说，“你要是早点告诉我，我肯定找时间去餐馆请你吃饭了。”

我们一起散步，欣赏着草地上的兰花，随意地聊天。浩文的人缘很好，和很多人都还在联系，不管什么样的事他都知道。“丽丽在区里当了官，真是佩服；彭哥呢，好像是在一家互联网公司上班。”他说，“我记得他高考没考好，比一本线低了好几分，差点就去复读了，没想到这家伙现在混得有模有样的。”

浩文又提到了其他几个人，但我和他们一点也不熟，搞不清楚人名，所以听得有些走神。我用脚踢了踢路上的几块石头，没想到鞋带突然松了，只好狼狈地蹲下来系鞋带。

我本来以为浩文要带我在公园里面走几圈，结果他带我到外面的人行道上。“既然这次没法请你吃饭，等会我就请你喝个饮料吧。”

“你可别这么客气，我自己买就行了。”我告诉他，接着向街上望去。学生时代在这里卖烤肠的路边摊不见了，我们一路走到最近的小卖部。浩文从冷柜里拿出一根冰棍，问我要不要。我摆了摆手，然后打开冰箱，原本想拿一罐汽水，但最后还是拿了一瓶橙汁。我抢在浩文前面，把自己的饮料递给收银台的老头，告诉他：“分开付。”

后来，浩文带着我在街上逛，到了傍晚才各自回家。进了家门之后，我发现之前桌子上摆的一盘瓜子、花生、杏仁已经不见了，厨房里飘来饭菜的香味。我去厨房帮我妈干活，她递给我几个小碗，让我去盛米饭。吃饭的时候，我给她讲了今天和浩文聊的一些事，她听了之后沉默了片刻，然后说：“看来我真的是老了，怎么之前总感觉，你们还是小孩呢？”

Appendix B

Task 2. Characters with emphasis marks represent specific syllable targets.

1 旁边	11 上班	21 老头	31 大件行李	41 呼啦圈
2 动物园	12 差点	22 陶瓷盘	32 有点累	42 等一会
3 马路边	13 一点盐	23 杏仁	33 游玩	43 地摊
4 花瓣	14 走神	24 干活	34 餐馆	44 木棍
5 玩游戏	15 鞋带	25 琐事	35 人缘	45 汽水
6 休息一会	16 没法	26 公园	36 贪官	46 果汁
7 眼镜	17 香肠	27 开门	37 打分	47 大门
8 电影院	18 萝卜根	28 茉莉花	38 人模狗样	48 瓜子
9 聊天	19 易拉罐	29 小孩	39 人名	49 香味
10 坏事	20 酒瓶	30 跳绳	40 石块	50 饭碗