

# /æɪ/-/eɪ/ TRANSPOSITION IN AUSTRALIAN ENGLISH: HYPERCORRECTION OR A COMPETING SOUND CHANGE?

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## ABSTRACT

A sound change is underway in Australian English where /eɪ/ sequences are realised as [æɪ] by some speakers. Another less noted and possibly related phenomenon is also occurring, where /æɪ/ is realised as [eɪ] by speakers in the same region (/æɪ/-/eɪ/ transposition). In this investigation we introduce /æɪ/-/eɪ/-transposition, provide experimental data relating to it, and discuss issues surrounding the phenomenon. We also posit possible reasons for its existence: a) hypercorrection related to the /eɪ/->[æɪ] sound change, or b) the extension of an unrelated sound change where /æ/ raises in the presence of nasals.

**Keywords:** sound change, vowels, Australian English

## 1. INTRODUCTION

### 1.1. The /eɪ/-/æɪ/ sound change

A sound change is in progress in Australian English, where /eɪ/ -> [æɪ] for some speakers. For example, minimal pairs such as *hell* and *Hal* are no longer contrastive, appearing as [hæɪ]. We call this the /eɪ/-/æɪ/ sound change. The phenomenon appears to be regionally defined, occurring in the south-east of Australia's mainland, in the state of Victoria [2, 3, 5, 6, 7]. A similar sound change has also been reported to occur independently in other varieties of English, for example in New Zealand [1], and elsewhere.

With respect to Australian English, recent research shows that some speakers from Victoria do not distinguish /eɪ/-/æɪ/ in production [3], and that many listeners from the region have trouble categorising and discriminating words containing these combinations. Listeners from elsewhere in Australia do not have the same problems in perception [5, 6, 7]. However, only preliminary research has been carried out to date, and as such there are many unanswered questions relating to the /eɪ/-/æɪ/ sound change. In particular, its detailed acoustic-phonetic features, its precise distributional

characteristics, the sociophonetic profile of the people who use it, and the various implications it may have for the system of Australian English.

### 1.2. Introducing /æɪ/-/eɪ/ transposition

The focus of this study is a related, rarely commented on phenomenon where /æɪ/ -> [eɪ], which we call /æɪ/-/eɪ/ transposition. For example, some speakers realise the first vowel in a word such as *alcohol* with an [e] vowel. This raising has also only been reported to occur for speakers in Victoria, but has not been the focus of any earlier phonetic investigation to this point.

That transposition occurs is not surprising in itself. In summarizing phonetic and phonological variation across Englishes in general, it has been said that two variants of /æ/ are "competing globally" [8]. One variant is its lowering towards the /a/ vowel (which separates northern and southern Britain). The other variant is /æ/ raising, which is the form that transposition takes. This raising occurs in New Zealand English, as well as some British and American varieties. Raising of /æ/ also occurs before nasals for some speakers of Australian English (e.g., [4]).

For all the other varieties in which the /eɪ/-/æɪ/ sound change is reported to occur, to our knowledge, /æɪ/-/eɪ/ transposition has only been mentioned for New Zealand English. [10] reports on folklinguistic accounts, where language users commented on /æɪ/-/eɪ/ transposition occurring alongside the /æɪ/-/eɪ/ sound change. Interestingly, the reports only occurred within a narrow timeframe (from 1982 to 1992).

Cox and Palethorpe [3] provide the only quantitative evidence of transposition to date, amongst their analysis of the effects of velarised /l/ on Australian English vowels. The /eɪ/-/æɪ/ sound change occurred for all 13 Victorian speakers, and they note only very briefly that over half of these participants also transposed /æ/-/e/ before /l/. Crucially, neither transposition nor merger were observed in the speech of 20 participants from neighbouring New South Wales.

## 2. AIMS

The main aims of this study are to draw attention to /æ/→/e/ transposition, and provide experimental phonetic data relating to it. Given that no research has yet been carried out specifically into /æ/→/e/ transposition, our understanding of the phenomenon is necessarily embedded in previous experimental work we have carried out on the /e/→/æ/ sound change in perception. In our previous work, we analysed whether listeners can distinguish /e/→/æ/ tokens and explained patterns in their errors. However, we did not address the role of transposition, nor what might cause it. Exploration of these two points is an additional aim of the current study. Data are listener responses to a perception experiment, and (retrospective) acoustic analysis of tokens presented to listeners.

## 3. METHOD

### 3.1. Participants

345 native Australian English speaking listeners from Melbourne participated in three listening tests. In this study, we focus only on the first (open-choice) and second (forced-choice) listening test. A third listening test was a discrimination test (e.g., [6]), and is excluded from this analysis.

The listeners were senior high-school students and their teachers, who were attending an English Language workshop at The University of Melbourne. Participants listened to linguistics-based lectures, and then participated in questionnaire-based research. Their attention was not drawn to the /e/→/æ/ sound change, or to transposition, at any point. Participant demographics are outlined in [5].

### 3.2. Experimental task

Listeners read instructions, heard a male voice producing words with /e/ and /æ/ tokens, and were then required to make a judgement about what they had heard. All items were heard twice. The speaker who provided data for use in the experiments is a 30-year old male from Sydney (NSW) who contrasts /e/ and /æ/ prelaterally. In the open-choice task the prelateral items that listeners heard were *Alan* and *shell* and in the forced-choice task the prelateral items were *pellet*, *Ellie* and *tally*. Listeners also heard non-prelateral items and distracters (see e.g. [5, 6, 7]).

## 4. RESULTS

### 4.1. The role of /æ/→/e/ transposition?

Table 1 reports the general direction of listener misperception for prelateral /e/ and /æ/, whether /e/→[æ] “merger”, or /æ/→[e] “transposition”. The table lists the experimental item played to participants, how many listeners misheard the item (by choosing its /e/ or /æ/ competitor), and the proportion of errors in each case. The two open-choice items are listed first.

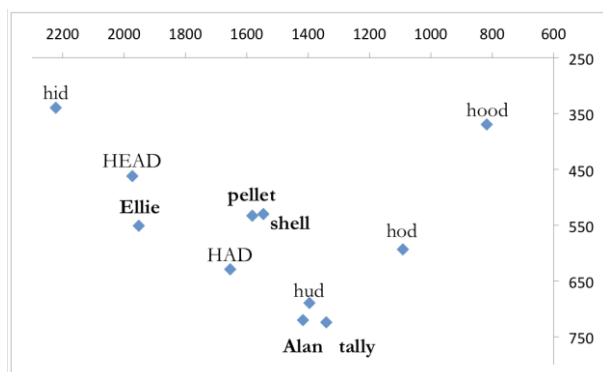
**Table 1:** Direction of listener misperception (no./345 and %)

		/e/→[æ] (merger)	/æ/→[e] (transposition)
played heard	<i>Alan</i> <i>Ellen</i>		134 (39%)
played heard	<i>shell</i> <i>shall</i>	25 (7.2%)	
played heard	<i>pellet</i> <i>palate</i>	25 (7.2%)	
played heard	<i>Ellie</i> <i>Allie</i>	15 (4.3%)	
played heard	<i>tally</i> <i>telly</i>		23 (6.7%)

The greatest number of errors were made for the open-choice item *Alan*, with a disproportionately and unexpectedly large number of listeners choosing the competitor *Ellen*. Misperception for the other items occurs far less frequently. When results for *Alan/Ellen* are compared with the similar items *Ellie/Allie*, played in the second experimental task, the unexpected strength of directionality towards raising in the former is particularly striking.

In previous work (e.g., [7]), we have argued that acoustic structure of experimental items plays a role in misperception. This includes both vowels (degree of height and retraction) and laterals (degree of velarization). Fig. 1 shows the F1/F2 vowel space for the speaker of the materials. We note that this vowel space shows only the target of lax vowels, with non-prelateral /e/→/æ/ capitalized and prelateral items bolded. Items other than these were recorded and measured by the speaker on a different occasion. New data provided here are for the open-choice items *Alan* and *shell* (other results were reported in [7]).

**Figure 1:** F1/F2 lax vowel space for the male speaker who produced the experimental tokens.



It is clear that all prelateral items are all lower than their non-prelateral counterparts (in the words *head* and *had*). Most, aside from *Ellie*, are also substantially retracted.

Items played in the open-choice task, *shell* and *Alan*, cluster acoustically with the items *pellet* and *tally* played in the forced-choice task. These results are interesting as far as the possible role of transposition is concerned. Firstly, the /æ/ tokens are at the lower limit of the speaker's vowel space, yet a large number of speakers reported hearing a mid vowel (especially for *Alan*), despite the fact that the token was played twice. Second, the acoustic clustering of *Alan* and *tally* together, produced with almost identical /æ/ tokens, is unexpected because perceptual results across the experiments were extremely divergent for these items. That is, over a third of listeners reported hearing /e/ in *Alan* but only 6.7% reported hearing /e/ in *tally*, as seen in Table 1.

As discussed in [7], acoustic structure of the vowel clearly has some effect on listeners, with the least retracted prelateral item (*Ellie*) recognised best. The other /e/ items have the same number of misperceptions (7.2%), and *tally* is also misperceived at approximately the same rate (6.7%). However, results cannot be fully explained by acoustic structure when the disproportionately high number of errors for *Alan* are considered. The analysis of the direction of misperception, coupled with the noticeably elevated error rate for *Alan*, leads to further questions about what might motivate listeners to categorise an /æ/ token as [e], and vice versa.

## 5. DISCUSSION

In previous work (e.g. [5]), we have analysed the /e/-/æ/ sound change using exemplar theory (like [9], for New Zealand English). According to this

theory, an exemplar is a remembered token of a speech sound, which occurs when speakers draw from overlapping exemplar “clouds”. In the case of the /e/-/æ/ sound change, listeners experience both [e] and [æ] tokens for /e/, and thus their remembered exemplars for this combination are especially variable.

In dialects where /e/->[æ], listeners' lexical categories for /æ/ should contain only [æ] exemplars, but their lexical categories for /e/ contain both [e] and [æ] exemplars. This means that listeners should be most confused when faced with /æ/ tokens, because their experiences have them hearing [æ] in both /e/ and /æ/ words. In contrast, [e] occurs only in /e/ words, and not for all speakers. Our results accord with this.

Something that is as yet unexplored is the fact that due to transposition, lexical categories for Australian English /æ/ actually contain both [e] and [æ] exemplars (albeit fewer exemplars, going by [4]). One of our results in particular, where *shell* was heard as *shall*, supports this. As well as exemplar theory, lexical frequency would predict that listeners choose *shell*, as *shall* is extremely infrequent in input, especially for young people. Note that we have also shown previously that lexical frequency does indeed affect listener responses (e.g [6]). However, a group of listeners chose the lower frequency item, despite hearing *shell* twice, suggesting that the presence of [æ] exemplars in the /e/ space is an issue.

In the current study, the possibility that /æ/-/e/ transposition is affecting listener responses is entwined with the direction of errors we expect under exemplar theory (i.e. that /æ/ tokens are more confusable). On the basis of these preliminary results we cannot yet untangle whether listeners are solely influenced by transposition (hearing *Alan* pronounced with [e] as the first syllable), or whether they have also been influenced by the /e/-/æ/ sound change (hearing *Ellen* pronounced with [æ] as the first syllable).

An issue we have not mentioned yet is order of presentation. Results here, with the extremely high number of errors for the first prelateral item played to listeners who simply had to write the correct word with no prompts, may suggest that order of presentation has had some effect on listeners. Indeed, this was thought to be a possible motivating factor in listener responses in [6]. However, the provision of further data allowed order of presentation to be ruled out as a factor in these listeners' responses [7]. We also note that

lexical frequency is not likely to be an issue for this item, as both *Ellen* and *Alan* are names occurring at similar frequency rates in input, and choice of either should therefore occur at a random rate (the same is true for *Ellie/Allie*).

To date, we have thought that /æ/-/e/ transposition is probably a part of the /e/-/æ/ sound change, treating it as a form of hypercorrection (in agreement with [2]). In previous work, we have predicted that transposition is solely the hypercorrect by-product of a system in flux. Where the /e/-/æ/ sound change is a form of *hypocorrection*, transposition may be a countervailing tendency for language users to *hypercorrect*. The fact that both phenomena occur in the same region of Australia is some supporting evidence for this.

While this analysis is likely, there is a second, competing possibility. As mentioned in 1.2, raising of /æ/ also occurs before nasals for some speakers of Australian English. This means that caution is needed in interpreting transposition as solely the product of the /e/-/æ/ sound change. Hearing a raised /æ/ in *Alan* may be due to anticipatory nasality, with the presence of nasality linked to final /n/, triggering, for many listeners, vowel raising. Results for *Ellie/Allie*, where no nasal is present and listeners made few errors, and only in the direction of vowel lowering, support this. Linking transposition to some presence of nasality also accords with the characterization of Australian English as hypernasal [10]. In this variety, elevated word-level nasalization or nasal spreading across syllables in the presence of a nasal consonant is normal.

At this stage, more research is needed to test this alternative hypothesis. Specifically, future research into /e/-/æ/ in Australian English must take into account vowels in prenasal environments, prelateral environments where a nasal is present in the word, and prelateral environments where no nasal is present in the word.

## 6. CONCLUSION

/æ/-/e/ transposition adds unexpected layers of complexity to our ongoing investigation of the /e/-/æ/ sound change in Australian English. To date, only preliminary experimental results relating to the phenomenon exist, and these are a side effect of other investigations (i.e. [2, 3, 4, 5]). Our future research will investigate both the /e/-/æ/ sound change and /æ/-/e/ transposition more fully, and

will include detailed phonetic and socio-phonetic analyses. In particular, we will address some of the questions raised in 1.1 relating to the sound change, and we will also address the main question now arising from investigation of results in the current study. That is, why does /æ/-/e/ transposition occur in the system of Australian English? Future research will determine whether it is indeed the product of a system in flux, or whether it is part of a competing and unrelated sound change linked to nasality.

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