Constant Rate Hypothesis, Age-grading, and the Apparent Time Construct[1]

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1 Introduction

In doing historical linguistics synchronically, sociolinguists oftentimes use what is known as the apparent time construct (Bailey et al. 1991). The logic behind this construct is that synchronic age differentiation reflects ongoing historical language change, so that the linguistic features of today's 20-year-olds are a precursor of the 40 year-olds 20 years later. Turning the diachrony of language into a synchronic matter, it enabled variationists to observe language change in progress, something that was once deemed impossible (Hockett 1958).

The problem of apparent time construct, however, is that the synchronic age differentiation is ambiguous: it could represent a case of age-grading, so that the teenagers with frequent uses of a certain form begin to use the form less as they grow past adolescence. A real-time survey of a speech community with datapoints decades apart would be the best (and only) solution to this problem. Without it, one may wonder if there is any systematic method of discerning whether a given pattern of synchronic variation is a reflection of change in progress or age-grading.

This paper addresses this question by extending Kroch's (1989) Constant Rate Hypothesis (henceforth CRH) and explores its synchronic implications. It will be seen that the extended version of CRH logically makes a strong prediction about the diachronic status of synchronic variation. I will also show that counterexamples to the Hypothesis can be accounted for systematically.

2 What is Constant Rate Hypothesis (Kroch 1989)?

Simply put, the CRH says that language change proceeds at the same speed in all linguistic contexts where it occurs. Certainly, there is a difference in the degree to which

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contexts favor the innovative form, so that there are favorable contexts and not-so-favorable contexts defined by a set of linguistic features. But the speed, or the rate of replacement of the old form by the new, innovative form, is the same across all those contexts. To quote Kroch (Kroch 1989:200):

> ... when one grammatical option replaces another with which it is in competition across a set of linguistic contexts, the rate of replacement, properly measured, is the same in all of them. The contexts generally differ from one another at each period in the degree to which they favor the spreading form, but they do not differ in the rate at which the form spreads.

Statistically speaking, then, the CRH is tantamount to saying the following:

(1) CRH in statistical terms
In language change, the effects of each linguistic context toward the rate of the new form are independent of the time and stay constant.

The significance of the CRH becomes clear when one considers Bailey's Wave Model (1973). The Wave Model says that language change proceeds in an S-curve fashion; it starts gradually, but suddenly, it gains momentum, running at a faster speed, until it peters off as it reaches the end point. Furthermore, Bailey equated the favorableness of each context to the rate of change and the order of appearance of change in each context: "[W]hat is quantitatively less is slower and later; what is more is earlier and faster" (Bailey 1973:82). Thus, the Wave Model predicts that the change proceeds faster if a context has a large positive effect toward the new form than in other contexts with less positive effects. This is exactly where the two theories differ, and accordingly, this is one of the points where the significance of the CRH lies.[2]

3 Extending the CRH

When Kroch proposed the CRH, his database consisted of historical data covering several centuries. But sociolinguistically speaking, these historical changes should necessarily be reflected in synchronic age-differentiation in apparent time, so that younger speakers use more innovative forms and less conservative forms, with older speakers showing the reverse tendency. Thus, what Kroch called *time* then becomes *age* in this picture. The content of his hypothesis should still hold under this transformation, as

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2 The CRH also goes against the predictions made by Anderson's Markedness Theory (Anderson 2001), though I will not touch on the issue here.

virtually nothing has been changed except the scale of time and the name of the axis. At this point, the hypothesis reads as follows:

(2) Extended CRH-I [ECRH-I]
In language change, age and linguistic contexts are independent of each other.

By taking a contraposition of ECRH-I, we would obtain (3):

(3) Extended CRH-II [ECRH-II]
If age and linguistic contexts are not independent of each other, the synchronic competition between two forms cannot be a reflection of language change.

In other words, the ECRH-II predicts that whenever there is an interaction between age and linguistic contexts, the observed variation cannot be a case of change in progress. In this form, then, the ECRH-II can function as a kind of litmus test to tell whether a given case of variation is a case of language change or age-grading. Note that the ECRH-II was derived from ECRH-I as a contraposition, which should necessarily hold whenever ECRH-I is true, and ECRH-I was derived by simply replacing time in CRH with age, a synchronic reflection of time.

Before looking at actual examples, let us check what kind of predictions ECRH-II makes. As we saw above, when age and linguistic context are not independent of each other (=interacting), ECRH-II predicts that it is not a change in progress, and accordingly, it can only be age-grading. But when age and linguistic contexts *are* independent of each other, ECRH-II does *not* say anything; this is because the prediction is relevant only when they are not independent of each other. In such a case, the variation can be age-grading or change in progress. Notice that ECRH-II predicts two cases of age-grading, depending on whether the age/linguistic-context independence obtains or not. Naming them A(ge)G(rading)-I and II respectively, the ECRH-II predictions are summarized as follows:

(4) Predictions of the ECRH-II
I. If age and linguistic contexts are independent of each other, then the variation is either (a) a change in progress or (b) age-grading (AG-I).
II. If age and linguistic contexts are not independent of each other (=interacting), then the variation is an age-grading (AG-II).

In the next section, we will see empirical evidence supporting these predictions.

4 Empirical Evidence for the ECRH-II

4.1 Age and Linguistic Contexts Mutually Independent: Change in Progress

Because this is exactly the case that Kroch (1989) dealt with, all of his examples —the replacement of *have* by *have got* in British English (Noble 1985), the rise of the definite article in Portuguese possessive NP (Oliveira e Silva 1982), the loss of V2 word order in French (Fontaine 1985) and the development of periphrastic *do* (Kroch et al. 1982)—fall into this category and are usable as supporting evidence.

There is also a growing body of evidence from real-time studies of language change in progress. Labov (1994:86ff) compares his original department store study in NYC in 1962 with the results from Fowler's replication study in 1986. In the two graphs showing the rate of *r*-pronunciation in two words (*fourth* and *floor*) in two styles (1994, Figure 4.4), the lines for each department store run almost parallel to its corresponding line in the other era. Taking the two words to be representative of the preconsonantal and word-final position, we can easily understand how this should be so: they are parallel to each other because the ongoing change observes the ECRH-II principle, with the effect of the linguistic contexts (phonological position of the *r*) is independent of that of age. Thus, we can assume that the evidence supporting the prediction I-(a) is a firm one.

4.2 Age and Linguistic Contexts Mutually Independent: AG-I

To the best of my knowledge, there is only one reported case for this category. Matsuda (1995, 1999) reported variable zero-marking of the accusative case in Tokyo Japanese. The variation involves an accusative case marker *-o*, which is variably realized as zero (∅) in natural speech:[3]

(5) Hora, koomuin siken -∅ ukeru -kara -sa
see government employee exam ACC take because FP
'See, because I'm going to take the government employees' exam"
[TY, 8839-0-569]

(6) Sore -o titi -ga yatteru n -desu -kedo
that ACC father NOM doing COMP COP but
'My father does it, but ...' [IJ, 9126-0-562]

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[3] ACC = accusative, COMP = complimentizer, COP = copula, FP = final particle, NOM = nominative. In the brackets are speaker's initial and the utterance ID.

Matsuda identified adjacency between the object NP and the verb as the strongest syntactic factor through a multivariate analysis of sociolinguistic interviews of Tokyo Japanese speakers, so that the zero-marking is most likely when the two constituents are strictly adjacent to each other. But the same analysis failed to detect a coherent monotonic difference by age. Matsuda (1999), however, found a sizable difference between teenagers and other age groups, which strongly suggests that it is a case of age-grading. If we plot the zero-marking rate for the two age groups (teenagers/other age groups) by adjacency, the two groups show almost parallel pattern, indicating that the linguistic contexts (adjacency) is independent of age (Figure 1). That is, it is a case of age-grading where age and linguistic contexts are independent of each other, and fits the prediction in (4) perfectly.

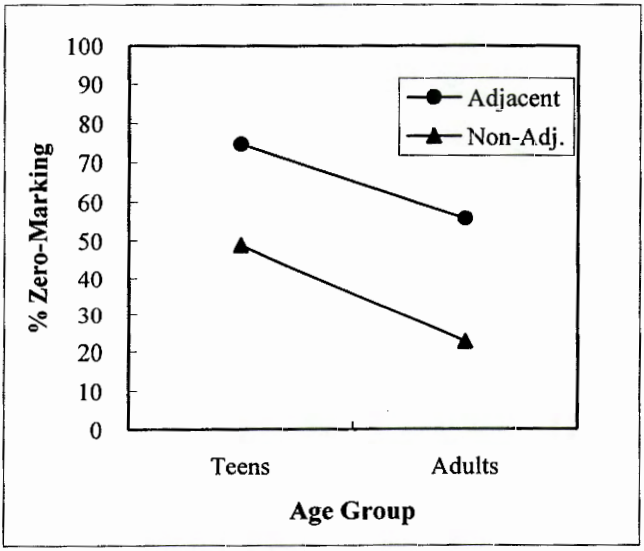

Figure 1. Adjacency effect for two age groups (Matsuda 1999)

4.3 Age and Linguistic Contexts Interacting: AG-II

The first case in this category comes from a study of *t/d*-deletion by Guy and Boyd (1990). As is well known, English speakers delete the final *t/d* less when it is a separate morpheme as in *missed, begged* than when it is a part of the same morpheme as in *mist, gold.* Between these two categories lies a class of past-tense/past-participle form of semi-weak verbs (*kept, told*), where the morphological status of the final *t/d* is am-

biguous. In their seminal study, Guy and Boyd demonstrated that the speakers gradually learn to treat the final *t/d* in English semi-weak verbs as if it were a separate morpheme as they grow older. In their figure (replicated here as Figure 2), speakers (represented by each dot) are seen to decrease the probability of *t/d*-deletion of semi-weak verbs as their age increases.

Note that nowhere in English dialects is *t/d* -deletion reported to be involved in change in progress, so the age-correlation here cannot be an instance of change. Rather, it is age-grading, a change over the lifetime of an individual that does not involve a communal change (Labov 1994:83). Thus, this is another case of age-grading (AG-II), but unlike in the AG-I case mentioned above, here the linguistic contexts (*i.e.*, morphemic status) *do* interact with age.

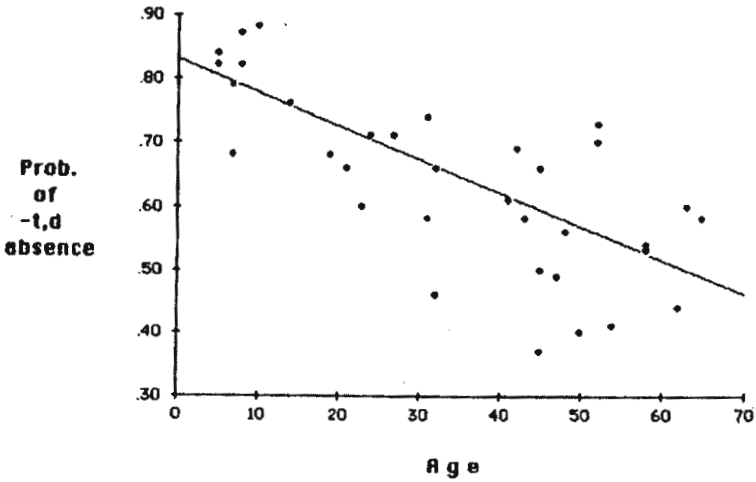

Figure 2: Probability of *t/d* Absence in Semiweak Verbs by Age (Guy and Boyd 1990:8)

There is another, somewhat similar example of AG-II. Wolfram (1969) checked a final consonant cluster simplification process in AAVE in Detroit, and located age-grading there. The rate of simplification shows regular monotonic convergence to the adult norm in the monomorphemic environment, suggesting that it is an age-graded phenomenon (Table 1). The rate of simplification in the bimorphemic environment, however, virtually stays the same, resulting in an interaction between the linguistic contexts and age, a good indication of AG-II.

	Age 10-12	*Age 14-17*	*Adults*
Monomorphemic	45%	43%	38%
Bimorphemic	13%	15%	14%

Table 1. Consonant Cluster Simplification in Detroit AAVE Speech (Wolfram 1969; adapted from Romaine 1984:107)

So far, we have seen that the predictions made by ECRH-II are all confirmed by empirical data from natural speech in the speech community. In the next section, I will deal with apparent counterexamples to the ECRH-II, and show what kind of generalizations one could derive from them.

5 Counterevidence to the ECRH-II

Counterexamples to the ECRH-II can be found in Labov's classic study of Martha's Vineyard (Labov 1963) and AAVE copula deletion in Springfield, Texas (Cukor-Avila 1999). I will begin with the Martha's Vineyard case below.

5.1 (ay) and (aw) in Martha's Vineyard

In the very first study in the variationist paradigm, Labov (1963) reported an ongoing sound change in Martha's Vineyard whereby the two diphthongs in the dialects, (ay) and (aw), are centralized. The strongest factor conditioning variation was the following segment, but the way those segments affected the variation varied by age. "[F]or older speakers, internal constraints involved a wide variety of phonetic factors; for the youngest generation, these were resolved into a simple opposition of following voiceless consonants against all other environments. External environments interacted with internal factors." (Labov 1982:52-53) Indeed, in this case the linguistic constraints on variation cannot be stated without reference to the age of the speaker, as the constraints differ for older and younger speakers. This, then, is a clear counterexample to the ECRH-II, which predicts that this variation in Martha's Vineyard could not be an instance of change in progress (obviously a false prediction).

5.2 AAVE Copula Deletion in Springfield, Texas

The second counterexample to the ECRH is found in Cukor-Avila's study of copula deletion in Springfield, Texas (Cukor-Avila 1999). In her analysis of a well- known phenomenon in AAVE whereby a copula is deleted variably (e.g. *she 's/∅ nineteen, he 's/∅ dancin'*), Cukor-Avila looked at the effect of the following grammatical ele-

ment in different age groups, and demonstrated that the pre-WWII and post-WWII generations have different constraint orders. For the former group, a participial is most likely to be preceded by a zero copula, with stative adjectives and non-stative adjectives less likely to occur with the zero copula (Participial > Stative Adj. > Non-stative Adj.). For the latter group, however, non-stative adjectives top the constraint hierarchy, followed by participial and stative adjectives (Non-stative Adj. > Participial > Stative Adj.). In other words, what used to be categorized with adjectives has now come to be categorized as verbal (participial). Because this is exactly a case of interaction between age and linguistic contexts in language change in progress, it is another counterexample to the ECRH-II.

5.3 Accounting for Counterevidence

Formidable as they look, both examples show certain similarities under close inspection. That is, these are cases where there existed some internal or external situation encouraging reinterpretation by the speaker. Since reinterpretation directly affects the linguistic contexts and reorganizes the basic scheme of the change, there will be a substantial difference in linguistic contexts for speakers unaffected by reinterpretation and those affected by it, resulting in an interaction between age and linguistic constraints. Accordingly, the change no longer observes the ECRH-II principle.

The Martha's Vineyard case fits this model perfectly. As for the internal constraints, older speakers were burdened with numerous phonetic factors controlling vowel centralization which were later simplified by the younger speakers into a simple voiced/voiceless distinction. Furthermore, it is worth noting that the relationship between the diphthongs changed as centralized vowels attained social symbol status, marking the speaker as a native Vineyarder, and spread to other ethnic groups, forming an external (social) environment for reinterpretation. The situation is described by Labov as follows (Labov 1972:169):

> The centralization of (aw) was part of a more general change which began with the centralization of (ay). This initial change proceeded from a moderate level of (ay) centralization which was probably a regional and recessive trait inherited from the original settlers of the island. The increase of centralization of (ay) began in a rural community of Yankee fishermen descended directly from these original settlers. From there, it spread outward to speakers of the same ethnic group in other occupations and in other communities. The structurally symmetrical variable (aw) began to show similar tendencies early in this process. The change was also adopted by the neighboring Indian group at Gay Head, and a generation later, spread to the large Portu-

guese group in the more settled sections of the island. In these two ethnic groups, centralization of (aw) overtook and surpassed centralization of (ay).

Such a situation strongly leads us to suspect that the reorganization of the phonetic constraint can also be traced back to this complex intersection of ethnicity and the time course of the change.

We find similar reasoning in the Springfield case. Here, it is the inherent ambiguity of the non-stative adjectives, which could be readily understood as adjectival or verbal, that encouraged the reinterpretation by the post-WWII generation. The ambiguity functioned as a window of vulnerability for reinterpretation, and once the newer generation exploited the ambiguity to simplify the constraint in their way between verbal vs. adjectival distinction, they modified the original course of the change to break off with the path predicted by the ECRH-II principle. Here again, reinterpretation was the mechanism that disrupted the ECRH-II-observant change.

The reinterpretation theory certainly raises several further questions concerning the basic mechanism of the process itself and its relationship with grammaticalization, which must await further exploration.[4] But one thing is clear: Reinterpretation is a limiting case for the ECRH-II predictions, and whenever it modifies the change, it will never observe the predicted course of the change.

6 Two Kinds of Age-Grading: AG-I and AG-II

Aside from the predictions on the way that language change proceeds, the ECRH-II also predicted that there must be two kinds of age-grading, one in which the linguistic contexts and age are independent of each other (AG-I) and another in which they are not (AG-II). Since the variationist paradigm has traditionally recognized only one type of age-grading, it is worth looking into the difference between the two processes here.

AG-I, judging from the Japanese example, seems to represent the classical case of age-grading that is characterized by a steep difference between adolescents and adults in the frequency of socially stigmatized, non-standard forms. Adolescents learn to use these forms under strong peer pressure, but as they are introduced to a wider range of social classes in later adolescent years, they gradually deviate from the vernacular pattern, toward the more prestigious speech of the upper middle class (Wolfram and Fasold 1974:91-92). Although the point has never been explicitly made in the literature before, what is involved in such a classical age-grading then is just an *overall* decrease in the frequency of a non-standard from, with the internal constraints kept perfectly intact during the whole process.

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[4] Thanks to Sali Tagliamonte, who raised this important issue at the time of the presentation.

There is another reason to support such a position. Labov (1994:85ff) demonstrated that in four real-time studies of change in progress, real-time change was accompanied by age-grading (Labov 2001:76). Note that the age-grading here is again age-grading in the classical sense of the term. Since a change proceeds with age and internal constraints mutually independent according to the ECRH-II, it follows that if a change and age-grading co-occur, the age-grading there must have characteristics of age-context independence as well. That is, it can only be AG-I. As such, our position above is supported by Labov's observation.

Compared with AG-I, our knowledge of AG-II is rather limited. To begin with, AG-II has never been treated as age-grading in the literature before, but given its correlation with age without being a change as in Figure 2, there is no reason not to classify this process as a kind of age-grading. It does, however, have some different characteristics from those of AG-I.

First and foremost, it seems to be free from the social evaluation that is a crucial part of AG-I. Thus, speakers are totally unaware of the change in the conditioning factors of their grammatical system they or the people around them undergo. The change concerns a fine detail of the system that it is not salient, hence the lack of social evaluation. Probably the most crucial fact here is that AG-I does not involve the decrease or increase in the overall frequency of some form, but the decrease or increase of a *factor weight*.

The second characteristic of AG-II is the length of the period of change. While AG-I occurs between adolescence and adulthood, AG-II can vary from a period comparable to that of AG-I (Wolfram 1969) to a life-long process (Guy and Boyd 1990). Although both cases involve phonology/morphology, how the length of the AG-II age-grading period correlates with the level of the linguistic system is not clear at all, as it touches on the ability of grammatical systems (Labov 1982).

7 Conclusion

I have shown above that Kroch's CRH can be transformed in to ECRH-I and II, and that ECRH-II makes meaningful predictions on the status of variation. Crucially exploiting the notion of independence between the linguistic contexts and age, I demonstrated that when the two are independent of each other, variation can be either a case of AG-I or a change in progress, while when they are not, it can only be AG-II. In such a way, ECRH-II enables us to judge at least that a given variation *cannot* be a change in progress from just synchronic, apparent time data. The ECRH-II also predicts that there are two distinct types of age-grading—AG-I and AG-II—with different characteristics. It then naturally follows that it is AG-I, and not AG-II, that co-occurs with change in progress. A close look at counterexamples established that reinterpretation is a limiting case for the ECRH-II predictions.

Certainly unanswered questions abound, as I have already mentioned in relevant places above. But no less important than those questions is the issue of paucity of reported cases of age-grading. As Chambers (1995:147) mentions, reports of age-grading are not numerous or at least not frequently reported. Furthermore, when reporting age-grading, researchers are usually not interested in detailed analysis of the internal constraints. As a result, sociolinguists have not had much chance to learn what was really happening in age-grading, leaving a huge gap in our understanding of language variation and change. Perhaps what has been behind such a tendency in the sociolinguistic community is our fascination with change phenomenon, and less enthusiasm about the lack of change. The picture depicted by the ECRH-II suggests, however, that age-grading is in no sense a wasteland. Rather, it could be a goldmine of new exciting findings about language variation and change.

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