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On Turbulence and Language Change

The notion of turbulence has never played a role in linguistics, historical or otherwise – either in the technical sense of the word, as in Hans Pecseli's contribution above, or in the various more or less metaphorical senses in which the word is used in Jonathan Williams' paper. For an observer who notices that no-one in a speech community speaks precisely like anyone else, the co-existence of the community's multifarious speech patterns might seem to exemplify a sort of turbulence. But once it is realized that language is not just speech, but that speech is derived from the systematic mental representations or competences of individuals, the initial, superficial impression yields to the understanding that the nature of language is very different from turbulence, whether in its literal or metaphorical sense.

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Rules, rules, rules

From the Sumerian–Akkadian grammatical translation tables of ancient Babylon (ca. 1900 B.C.) to the descriptive linguistics of the recent 1900s, the linguist's pursuit has always been based on the assumption that language behavior is rule governed. Consequently, that pursuit has always been dominated by (i) a search for observable regularities in speech, (ii) the formulating of grammar rules to which the observables would conform, and (iii) a quest for the principles – metarules, if you will – that govern the form of such rules. These are the aims of linguistic investigation articulated by Chomsky (1965) in his famous demand for observational, descriptive, and explanatory adequacy, but they can be recognized in linguistic writings as far back as our written records reach (Robins 1967).

Admittedly, usage is not completely regular. Even the best of us begin sentences we do not finish and produce sentences that begin one way and somehow change track and end another way. Words are often used in decidedly irregular ways. The morning paper writes about "a bullet-ridden street" (for *bullet-riddled*), an event that "was propitiated" by another (instead of *precipitated*), and someone who "did not have an inclination that NN was gay … [but] thought he was living with some woman" (for *inkling*; or *indication*; or both?). But this sort of linguistic disorderliness is not turbulence by any definition. It is significant, rather, that in conversation we are not fazed by irregularities like these. We mostly hear right through them, for we mostly attend to what we are being told and not the details of syntax or vocabulary used. If there is any turbulence in speech, language users are not aware of it. And linguists have not described it.

Variation (1)

Something akin to turbulence enters linguistic science in the guise – and much later under the name – of *variation* in the early 1800s. It is characteristic that when Bredsdorff (1821) observes the variant pronunciations of Danish unstressed *e*, he casts this observation in the shape of a rule: it may be a "fairly pure *e* before *s*, approach *ɛ* before *r*, or, most commonly *ö*". And when he records the different ways in which city folk pronounce everyday speech in Copenhagen, he assigns the variation (not yet so called) to two distinct styles, a formal and a colloquial (1817). A hundred years later Jules Gilliéron knew variation was a problem in collecting materials for the French dialect atlas. Unable to deal with it he decided to banish it from view by instructing his field worker Edmond Edmont to ignore any variant pronunciations by the informants and consistently note down only their first response to each item in the questionnaire (Bottiglioni 1986). Only a hundred and fifty years after Bredsdorff did variation in speech become a serious object of study, in the work of William Labov and his students. In short order, numerous variable features were described in phonetics, morphology, and syntax along the parameters of style, social status, age, gender, and ethnicity, first in American English and soon after in many other languages.

Turbulence?

This work had serious implications for an understanding of language.

First of all, different cases of variation could be described (i) as the variable output of a rule, (ii) as the variable application of a rule (an optional rule), or (iii) as variable constraints on the application of a rule; many cases of variation turned out to be quite complex, with several, hierarchically ordered constraints. (A few simple examples follow below.) Although individual sociolinguistic investigations naturally focused (and continue to focus) on one or a few individual cases of variation at a time, it quickly became apparent that what was being described was perhaps just bits and pieces of a vast congeries of patterns of variation, each one describable only in statistical terms; and that congeries was normal, everyday speech.

This was startling news to the grammarian who had been weaned on the idea of speech as rule-governed behavior. It seemed that once we recognized the existence of an unlimited set of variations in language, in part of great complexity, we might have to conceptualize the flow of human speech as literal or metaphorical turbulence.

The second major implication of these findings was for our understanding of the human capacity for language. It was obvious, from Labov's earliest work onwards, that sociolinguistic variation is meaningful. For example, his (1963) paper on the variant pronunciation of the /ai/ and /au/ diphthongs on the island of Martha's Vineyard, Massachusetts showed that speakers who used one set of variants identified more with the island community, whereas speakers who used the other set expressed greater allegiance with the mainland. Later investigations tested variables in a variety of settings, such as spontaneous conversation, responses in a formal interview, reading a text aloud, and reading a list of words aloud. These quite mundane conditions left no doubt either: the observable variation in usage is not random but well-ordered; speakers know what they are doing, they choose pronunciation variants to fit the situation they

are in. Precisely how much or detailed insight speakers have into the choices they make as they speak is a matter of debate. But it is clear that language behavior is indeed guided by rules; however, the rules may have variable outputs, may be optional, or may apply with a variety of constraints, and in each case the alternatives can be described as statistically weighted.

Variation (2)

There was a paradox in these discoveries. Few linguists had given much thought to the variability of language usage, and fewer thought it was significant. But at the very time its full extent was revealed, it was shown to be a great deal more orderly than anyone could have imagined.

Sociolinguists are typically cautious when speaking about the output of variable rules and traditionally use the detached language of statistics, in which speakers' gender, age group, or socio-economic group are spoken of as 'factors' that 'determine' the output of the respective variable rules. This output is cautiously called 'markers' of gender, age group, or socio-economic group, as the case may be. But of course an individual's choice of 'markers' is not *determined* by their biological age, though it may reflect their perceived relative age; it is not *determined* by their socioeconomic (gross income) status, but more likely reflects their perceived class membership. Similarly gender markers are not *determined* by biological sex, but signal the speaker's placement along a (language or community-specific) scale of femininity–masculinity. The 'markers' are signs, technically, indexes. The subjective basis for speakers' choices of stylistic and social-class indexes accounts for a great deal of the observed range of variation; it has an obvious blurring effect in the statistics. It is essential for an understanding of the nature of variation to recognize both this subjective element and the limits defined by social convention within which speakers can exercise their choices.

But despite the subjective choices made by speakers, different variables largely correlate. For instance, in New York City speech the presence of syllable-final *r* (*beard*, *four*) increases in frequency across styles (from casual speech to word lists) and across social classes (from lower class to middle class); similarly the use of [d] for *th* (*them*, *those*) decreases across styles (from casual speech to word lists) and across social classes (from lower to middle). And each of such style and class correlations conforms to a chronological progression. The formerly '*r*-less' New York dialect is acquiring syllable-final *r* through exposure to general American pronunciation; the reinstated *r* occurs earlier in higher than in lower classes and earlier (for all classes) in more than in less careful styles. The local, stigmatized [d] for *th* is yielding to general American ð; this change too occurs earlier in higher than in lower classes and is observed earlier in more careful than in less careful styles (Wolfram and Fasold 1974). Similar examples can be found in all languages.

It is by no means all variations that reflect changes in progress, and the way age grading reflects ongoing change is not in every case direct. But on the whole, the general picture is clear: Each speaker has a passive knowledge of most or all variations that currently serve to index the social classification (age, gender, class) of members of the speech community; and for each variation, the speaker commands a range commensurate with their individual social-class membership, which the speaker uses to index

different speech styles. Speakers know which behavior is appropriate under which circumstances. Each speaker's communicative competence includes a personal version of the community's appropriateness norms.

This conception of variation is important for a coherent account not only of variation but also of language change.

Language change

It has always been a mystery why languages change. Many linguists are convinced that speakers change their languages to improve them. But this cannot be generally correct, for languages change all the time, and there is no evidence that they are getting better and better. On the other hand, speakers who are thoroughly familiar with a language, such as mature speakers, usually agree that new ways of speaking that are being inflicted on their language by the younger generation are changing it for the worse. But there is no evidence that they are right either. Evidently, the problem of language change needs to be approached with a little more circumspection.

Before asking *why* languages change, one must consider *how* change comes about, which is less of a mystery. Typically one or more speakers create a new expression, or a new pronunciation, and use it; others adopt it and use it in their speech; once enough speakers use it, new cohorts of speakers will learn that expression or pronunciation as part and parcel of the language. So, for every individual change we can ask why a given new expression or pronunciation was created, and why it was widely adopted. Once an expression has been adopted widely and is in widespread use, it is not surprising that it would be acquired by new cohorts of learners. To put it differently, change follows as an unsurprising consequence of innovations of different kinds, which may have come about for different reasons.

But before we go on, notice that the initial innovation, the new expression or pronunciation, the moment it is created and when it is adopted, is a variant of an already existing expression or pronunciation. (In the limiting case of a new word for a new concept, the new expression is an alternative to a circumlocution.) I will leave aside for now the types of change that happen simply as language is transmitted from generation to generation. Instead, we will look at several kinds of 'contact change'.

Consider first the introduction of syllable-final *r* in the New York City dialect (*beard*, *four*). The very first speakers who modified their *r*-less speech may have done so because they found the *r*-ful pronunciation better, either because it was closer to the spelling, or because it was that of the radio and television networks or a majority of conscripts in the armed forces; this is an empirical issue, which can be investigated. To modify their speech these New Yorkers immediately made their *r*-dropping rule optional. Those who adopted this usage similarly made their *r*-rule optional, perhaps for the same reason or reasons as the innovators.

In the time since this happened, generations of New Yorkers have acquired an optional *r*-rule, which has gradually been applied less and less. They have acquired it in a community with two kinds of speakers (from the linguist's point of view): natives with variable usage and newcomers to New York with consistent *r*-ful usage. But notice that in reality new learners in this community have encountered, besides the consistently *r*-ful usage, a range of different degrees of variable usage; for

since it first became optional, the *r*-rule has been applied differently by different age groups and different classes in different styles. To an outsider, this usage would seem chaotic and confusing. But this multivariant picture has not prevented new generations of native New Yorkers from continuing to acquire the *r*-rule and its variable usage in conformity with their own age group norms, social class norms, and corresponding stylistic norms. At the same time, successive cohorts of speakers have acquired the *r*-rule with gradually decreasing frequency of application. And more and more native New Yorkers have acquired the *r*-rule only as passive knowledge, while in their own usage they consistently pronounce syllable-final *r*. (For an explanation of such gradual change, see Andersen 2001.)

Mixed languages

The second example of contact change we will consider is the situation when several languages are used in a community. In such a case, an observer might easily find the community usage chaotic.

Linguists distinguish several kinds of 'mixed languages', the most important ones being pidgins and creoles. A pidgin is an *ad hoc* language created for practical purposes by speakers of different languages. It combines elements of these languages and is typically used for specific topics of communication, such as trade or work. A creole is a language that has developed from an 'expanded pidgin'. It is spoken in part, predominantly, or exclusively by speakers who have acquired it as their first language. No longer *ad hoc*, it has been adapted to communication on all topics relating to community life (Mufwene 2001).

It is sometimes said that pidgins are not 'real' languages, or 'natural' languages. Such statements reflect the outsider's point of view. In fact, the makeshift character of a pidgin merely results from an elaboration of individual speakers' competences. It arises when individual speakers add to their full first-language (L_1) competence expressions and constructions they adopt from speakers of a contact language (L_2). These elements are adopted as variants of existing L_1-elements, they have special social value, and they serve to adapt the individual's speech to socially defined situations and/or addressees. Speakers of the other language (L_2) may also adapt their speech in those situations, and it may well be that L_2-based speech is quite different from L_1-based speech – although the two are mutually comprehensible. The combined L_1 and L_2 usage may strike an outsider as chaotic. But it results from individuals using vocabulary and syntax that they have added to their initial grammatical competence by means of 'adaptive rules' (Andersen 1973). There is nothing unreal or unnatural about pidgins. But they differ from regular languages by (i) being used for limited purposes, and (ii) by their *ad hoc* character, their lack of community-wide appropriateness norms.

Creoles are regular languages, used for general purposes and according to community-wide norms. They are interesting to the linguist by the fact that their vocabulary and syntax are not received from a single tradition of speaking, but contain elements from several languages. A few creoles are known in which these different elements have an orderly distribution. In Michif (spoken in North Dakota), for instance, verbs are Cree (an Algonquian language), but most nouns are French (Thomason and Kaufman 1988). But in most creoles, the different language elements are not distributed by any clear functional principle. In terms of their origin,

therefore, they appear to be helter-skelter. But this has no relevance for the speakers. And the grammar of any creole is just as well organized as that of any other traditional language.

Variation (3)

It is impossible to exemplify in speech the "random fluctuation of local velocities and pressures" of the dictionary definition of turbulence. The objectively chaotic usage in dialects or languages in contact is as close as one can get. But a closer look at such examples suggests why turbulence does not play a role either in speech or in the transmission of language.

Speech is rule-governed behavior in which each individual's usage is guided by rules. The rules may be variable in a number of ways and may differ from those of other members of the speech community. But they do so in an orderly way and in accordance with a system of appropriateness norms shared by the members of the community. The one exception to this is the *ad hoc* limited-purpose pidgins.

Learners of a language – any language, including creoles – approach the usage they hear with definite expectations regarding basic semantic and phonological categories and elementary construction types on all levels of linguistic structure, but also with a readiness to grasp apparent fluctuation in usage as well-ordered variable usage. They are aided in this task, undoubtedly, by an expectation that each case of variation that is not phonologically or grammatically conditioned serves to index social group membership – age, gender, social class, or ethnicity – but never other features of speakers (skin color, stature, or other physical characteristics). Furthermore, it appears, they are ready to assign values to such variables in such a way that on the whole, the values of each category of variation are congruent with those of others. The resulting system of values thereby acquires a high degree of cohesion. In addition, they typically do this with such a high degree of uniformity that the members of a community tacitly subscribe to practically identical conventions (Andersen 2001).

We can imagine that at some level of detail – in the occurrence of phonetic, syntactic or other features – there is a threshold above which learners readily impose patterns of variation, typically similar patterns to those of the speakers they choose as their models. In this way patterns of variation may remain relatively stable in a tradition of speaking. Undoubtedly, below this threshold there are objectively speaking unordered distributions or fluctuations of detail. But this flux is devoid of significance for the speakers. It can become significant – that is, socially meaningful – only (i) if it is grasped as regular (rule governed) and ascribed social meaning, and used in accordance with such an innovative interpretation; (ii) if this pattern of usage is adopted and used by suffi-ciently many others; and (iii) if it is subsequently acquired by new cohorts of speakers (Andersen 1989).

Our innate capacity for language is, or includes, a capacity for imposing order on speech data. One might say that the nature of language is anti-thetical to the notion of turbulence.

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