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The effect of usage on degrees of constituency: the reduction of *don't* in English*

JOAN BYBEE and JOANNE SCHEIBMAN

Abstract

In this paper we take the position that there are many degrees of constituency and that these derive in a direct manner from the frequency with which elements are used together: elements that are frequently found next to each other show a tighter constituent structure than those that collocate less frequently. We use both phonological and functional evidence from conversation to argue that repetition conditions chunking (Haiman 1994), sometimes overriding the syntactic and semantic logic of the organization of utterances. Our study examines the reduction of don't *in American English conversation. We find that* don't *is reduced the most in the contexts in which it occurs the most, that is, after* I *and before certain verbs, such as* know. *While a generalized constituent structure may be an emergent property arising from many analogous utterances, specific combinations that are frequently used may diverge from the general pattern because frequency conditions autonomy in storage and renders internal analysis unnecessary. This phenomenon reveals the essential role of repetition in the creation of constituent structure: while semantic and pragmatic factors determine what occurs together in discourse, the actual repetition of stretches of talk triggers the chunking mechanism that binds them into constituents.*

In this paper we take the position that there are many degrees of constituency and that these derive in a direct manner from the frequency with which elements are used together: elements that are frequently found next to each other show a tighter constituent structure than those that collocate less frequently. We use both phonological and functional evidence from conversation to argue that repetition conditions chunking (Haiman 1994), sometimes overriding the syntactic and semantic logic of the organization of utterances. While a generalized constituent structure may be an emergent property arising from many analogous

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utterances, specific combinations that are frequently used may diverse from the general pattern because frequency conditions autonomy in storage and renders internal analysis unnecessary (Bybee 1985, 1988, 1995b). This phenomenon reveals the essential role of repetition in the creation of constituent structure: while semantic and pragmatic factors determine what occurs together in discourse, the actual repetition of stretches of talk triggers the mechanism that binds them into constituents. The general priniciple we propose to predict the degree of cohesion between elements is the following: the greater the probability that one element will follow another, the tighter the grammatical cohesion between them. We further propose that this principle derives from the nature of memory storage of linguistic experiences.

1. Grammaticization

First consider the fact that constituent structure changes in grammaticization. Heine et al. (1991) point out that changes in constituent structure are common in grammaticization; in particular some instances of grammaticization involve a change in dependency relations within constituents, as, for example, when a head noun in construction with a genitive becomes a preposition, or when a main verb with a verbal complement becomes an auxiliary and the erstwhile embedded verb becomes the main verb. Such changes are accompanied by decategorialization (Hopper 1991) — the loss of morphosyntactic behavior characteristic of the major lexical categories, noun and verb. All of these changes involve a downgrading of constituent boundaries — from those separating higher-level constituents to those separating lower-level ones. Heine et al. (1991) find the claim that grammaticization downgrades constituent boundaries problematic, but our examination of their examples suggests that in every case, higher-level constituents become lower-level ones: for example, two clauses become one, V–NP becomes P–NP, etc. All such changes are gradual and conditioned by repetition.

The gradual nature of diachronic changes in constituent relations manifests itself as a continuum of constituent types in synchronic language. As Heine (1993) points out, the gradual loss of feature is characteristic of verbs and the gradual acquisition of grammatical properties is precisely what makes auxiliaries so difficult to categorize and leads to the controversy among synchronic grammarians as to whether they are best considered to be verbs or a category unto themselves.

The role of frequency or repetition is also well documented in the study of grammaticization. Enormous frequency increases are observed

during grammaticization. However, frequency increases should not be viewed as simply a consequence of the increase in the appropriate contexts of use of a form undergoing change, but as Haiman (1994: 14) has observed, repetition itself can be considered a major force behind the creation of rituals and conventions that in language are manifested as grammar. Among the effects of repetition on grammar (see Bybee and Thompson 1997), two are of special importance to our understanding of the change of constituent structure in grammaticization: chunking (automatization) and lexical autonomy. In chunking (Haiman 1994), a frequently repeated stretch of speech becomes automated as a processing unit. The original internal structure becomes less important and can be obscured by phonological change, making the unit more efficient to process (Boyland 1996). At the same time, high levels of usage also lead to autonomy. High-frequency collocations weaken their association with related items, as when, for example, *be supposed to* [spostə] (showing phonological assimilation) takes on functions increasingly less related to the meaning of *suppose.* In the example to be studied in this paper, various phrases with *don't* in them, such as *I don't know* and *why don't you*, fuse phonologically and the whole phrase takes on special discourse functions. Both chunking and autonomy lead to the loss of internal structure within constructions (cf. Goldberg 1995). Therefore, the grammaticalization of phrasal patterns based on usage (which includes changes in constituent relations) may be viewed as the creation, modification, or dissolution of constructions.

2. Natural chunking

The more often two elements are used together, the more tightly they will be fused or bonded phonologically and semantically, and thus the tighter their constituency. Pragmatic and semantic factors determine the frequency with which any two particular items will be contiguous. But in looking at constructions as generalizations over sequences of elements, another factor comes into analytical play: the chances that the same two elements will occur together is a function of the number of elements there are to select from in any two contiguous positions. Within a construction, some positions may be occupied by a single gram, a small set of grams, a semantically defined set of nouns or verbs, or a totally open set of nouns or verbs. For example, consider the construction for normal negation in English:

NOUN PHRASE Aux + *n't* VERB

Here NOUN PHRASE and VERB are fully open classes,[1] AUX designates a set of some 20 members (counting all inflected forms), and the negative position holds only one member (*n't*). Note further that the two positions with the fewest options are the most fused phonologically — the AUX and the negative — and they are the least likely to be separated by other intervening items, such as adverbs or parentheticals.

Constituency follows from our experience with language — the way it is used and the way it is recorded in memory. Consider a storage mechanism for language, proposed for morphology (Bybee 1985) but applicable to larger stretches of language as well, in which representation is highly affected by language use (see also Langacker 1995). Fragments of our linguistic experience are recorded, sorted out, categorized, and associated with other identical or similar records of linguistic experience. Activation of a linguistic element in production or decoding strengthens its representation in memory. Use of elements in sequence strengthens their syntagmatic relations. Elements very frequently used together fuse (e.g. *going to* > *gonna*). Classes of elements used together create constructions; bondedness within and between constructions depends on how frequently two contiguous elements occur together.

3. Reduction of *don't*

Phonological indicators of constituency arise as part of the automatization process. Bybee (1996) argues that alternations arise only WITHIN storage units, which are very often word-level units, giving rise to the concept of "word-level phonology." Constructions are storage units as well, and alternations can arise within constructions if they contain specific phonological material, say in the form of grammatical morphemes, as in French liaison (Tranel 1981), or the alternation in *a*/*an* in English.

It is also well known that ongoing phonological changes often affect high-frequency words to a greater extent or at a faster rate than they do low-frequency words (Bybee 1995a; Hooper 1976; Phillips 1984). Bybee (1995a) proposes that phonological processes of reduction and coarticulation affect lexical items on line in production, and that the effects of these phonological processes gradually change the shape of the stored representation. Since there is variability in all phonetic productions, and the range of phonetic variants may differ by lexical item, lexical representations must contain a range of variation for each item based on actual productions. This range gradually shifts as change proceeds. Given that

high-frequency items have more exposure to the articulatory forces of production, they undergo change at a faster rate.

The case we discuss here, the case of the reduction of *don't* in spoken American English conversation (Scheibman i.p.), is a case characterized by variation, which, when examined in context, allows us to make inferences about the usage factors influencing constituent structure. We find that the reduced variants of *don't* are not just favored in, but actually restricted to, the most frequent environments in which *don't* occurs. Syntactic treatments of the reduction of *don't* attempt to trace the conditions that allow reduction to constituent relations (Kaisse 1985), but even these treatments recognize that reduction depends heavily upon the subject's being a pronoun and the verb following *don't* being one of a small set of verbs frequently used with *don't*. While previous analyses of the reduction of *don't* have been based on speakers' intuitions, Scheibman (i.p.) studied the variants of *don't* in natural conversation.

3.1. *Description of the database*

One hundred and thirty-eight tokens of *don't* were taken from approximately three hours and 45 minutes of naturally occurring conversation tape-recorded by Scheibman. The conversations took place on three separate occasions and represent the speech of six participants, four females and two males, all residing in Albuquerque, New Mexico. The usages were transcribed using a conventional tape recorder and earphones; therefore, it was often difficult to hear subtle phonetic differences such as the nasalization of a vowel or the presence of a nasal consonant. For this reason, a decision was made to group the tokens into the following four categories.

Group 1

Those tokens with a full-stop consonant and a full vowel, schematically represented as *stop* + *o*. This group includes [dõt], [dõn], and [dõ] and their oral vowel counterparts. The presence or absence of vowel nasalization does not contribute to the analyses given in this paper.[2]

e.g. we *don't* see him all ˆwinter
[dõ]
most of the time he lives underground. (G1.34S)[3]

Group 2

Those tokens with a reduced consonant, specifically an oral or a nasal flap, and a full vowel. This group is represented as *flap* + *o* and includes the variants [ɾõt], [ɾõ], and [ɾ̃õ] and their oral vowel variants.

e.g. J: who did it?
L: well they `*don't* ˆknow who `did it. (G2.13N)
[ɾo]

Group 3

Those tokens with both a reduced consonant and a reduced vowel. This group is represented as *flap* + *ə* and includes [ɾə̃] and [ɾ̃ə̃] and oral vowel variants.

e.g. can you imagine?
I *don't* know if I could ˆdo that. (G3.496S)
[ɾ̃ə]

Group 4

Those tokens with just a reduced vowel, represented as *ə* and including [ə̃] and [ə].

e.g. I *don't* know ˆanything about `guns.
[ə̃]
but god damn it,
I'm getting sick of this shit. (G3.181O)

The majority of *don't* usages appear in declarative constructions in a simple clause or in a main clause of a complement constructions (e.g. *I don't* [ɾ̃ə] *ˆknow if it would be such a `great job.*), eight of the 138 tokens are found in interrogative structures (e.g. *well why `don't* [ɾõ] *you do a ˆsurvey?*), and six usages are part of negative imperative forms (e.g. *don't* [dõ] *assume ˆI'm `guilty.*).

3.2. *Patterns in the data*

Our first prediction — that *don't* will be more reduced in the immediate linguistic contexts in which it is most used — is borne out by the data in a very robust way. First consider the requirement formulated by Kaisse (1985), that the subject be a pronoun for reduction to occur. In the data examined here and presented in Table 1, it can be seen that when flapping occurs, the subject is a pronoun and never a lexical noun phrase. The further reduction, of the [o] to [ə], however, occurs only with *I*, the most frequent of the pronouns, and once in the phrase *why don't you.* Thus it is not enough to single out the class of pronouns as conditioning reduction: this is neither entirely accurate nor explanatory. Instead we see a frequency effect: not only do pronouns occur with *don't* more often in the data than do other subject noun phrases, but the pronoun that appears most often (*I*) also occurs with the most reduced forms of *don't*.

Why would these more frequent forms, the pronouns, condition flapping in *don't*? Flapping of a coronal occurs within a phonological unit

Table 1. don't *variants by type of item preceding or by type of construction (n = 138)*

Preceding/Type	stop + o Group 1	flap + o Group 2	flap + ə Group 3	ə Group 4	Total no.	%
I	16	22	38	12	88	63
you	7	7			14	10
we	2	6			8	6
they	1	3			4	3
lexical NP	5				5	4
pause	1				1	1
adverb	2	2			4	3
neg. imper.	6				6	4
interrogative	3	4	1		8	6
Total	43	44	39	12	138	100

when the coronal is both preceded by and followed by a syllabic unit and the syllable preceding the coronal has more stress than the one following it. Flapping rarely affects a word-initial /t/ or /d/. Apart from their all ending in vowels, there is nothing special about the pronouns that would cause them to condition flapping more than any other unit, except the frequency with which they occur with *don't*. Our hypothesis is that the pronoun and *don't* constitute a storage and processing unit that is gradually undergoing reduction due to frequency of use (Bybee 1995a).

The vowel reduction (o → ə) that is observed in this case is often regarded as conditioned by the relative lack of stress. We are not directly appealing to stress, however, because the main indicator of lack of stress is precisely the reduction of the vowel to schwa. In other words, the reduced vowel and the perception of reduced stress are not independent of one another.[4] Moreover, we would still have to explain why the vowel and stress reduction only occurs when *I* is the subject. Since there is nothing in the phonological properties of *I* that could condition the reduction, we must conclude that it is the frequency with which *I don't* is used as a sequence that is responsible for the reduction of the vowel.

In addition, as shown in Table 2, the vowel reduction occurs primarily with the verbs that occur most frequently in the data: *know*, *think*, *have (to)*, *want*, *like*. Vowel reduction also occurs with three other verbs, *mean*, *feel*, and *care*, which are not particularly frequent in our corpus, but of course all of these occur very commonly in the phrases, *I don't mean*, *I don't feel*, and *I don't care* in American English. Again, there is nothing in the phonological properties of these verbs that would condition

Table 2. don't *variants in declarative constructions by following expressions (n = 124)*

Following	stop + o Group 1	flap + o Group 2	flap + ə Group 3	ə Group 4	Total
know	2	8	24	5	39
think	7	6	6	1	20
have	1	7	1		9
have to	1	2	1		4
want	1	1	3		5
see	3	1			4
like		1		1	2
get	1	2			3
mean				1	1
feel				1	1
care			1		1
play		1			1
meet		1			1
believe		2			2
inhale	2				2
work		1			1
support		1			1
give		1			1
need		1			1
intend	1				1
go out	1				1
make contact	1				1
follow through	1				1
do	1				1
code	1				1
eat	1				1
Total					
verb tokens	25	36	36	9	106
verb types	15	15	6	5	26
adverb/disc marker	3	3		1	7
pauses/break	6	1	2	2	11
Total	34	40	38	12	124

vowel reduction in a preceding word. It is rather the frequency with which these phrases — *I don't know*, *I don't think*, *I don't have (to)*, *I don't want*, and *I don't care* — are used that has rendered them fused storage and processing units and has conditioned the loss of stress on the middle element and its consequent reduction.

4. Storage and processing

Almost all of these reduced phrases also occur in a nonreduced form in our data. The individual elements in these phrases, *I*, *don't*, and the verb, are storage and processing units as well, so that it is also possible to use them compositionally. In addition, each of these individual units is associated with the stored combinations, *I don't know*, *I don't mean*, etc. In this way, these phrases are parallel cognitively to the morphological formations modeled in Bybee (1985, 1988) and Losiewicz (1992). In this associative network model of morphology, irregular forms are stored lexically and associated by lexical connections with similar forms. But lexical storage is highly affected by language use, such that high-frequency forms have stronger lexical representation than low-frequency forms. It is for this reason that low-frequency irregulars tend to regularize. But it also follows that high-frequency regular morphological formations would be represented in memory. So high-frequency past tense/past participle forms such as *supposed*, *wanted*, *liked*, and so on would also be strong storage and processing units (Baayen et al. 1996; Stemberger and MacWhinney 1988).

Losiewicz (1992) devised a test of this hypothesis based on earlier findings by Walsh and Parker (1983). In a series of experiments Walsh and Parker found that English /s/ in word-final position is longer in acoustic duration if it is the plural morpheme (*laps*) than if it is part of a monomorphemic word (*lapse*). Losiewicz (1992) found this same distinction applies to morphemic /d/ or /t/ (the past tense) as in *rapped* versus nonmorphemic final /d/ or /t/ as in *rapt.* Losiewicz further reasoned that if the difference in length is due to the nonmorphemic segment being part of a lexical representation, while the morphemic one is added to the stem in processing, then the same difference in length should appear in low- versus high-frequency words with morphemic /d/, since the low-frequency words would be formed by using a schema and the high-frequency words would be accessed directly from the lexicon.

Losiewicz asked subjects to read sentences containing English past tense forms that constituted rhyming pairs of high- and low-frequency verbs (*covered*, *hovered*; *needed*, *kneaded*). For all subjects and all pairs of verbs, the final past morpheme was longer in the low-frequency verb of the pair. The average duration difference was 7 ms, and this difference was highly significant and not due to overall differences in word length. It is not proposed that such a length difference is either perceptible or learnable from input, but rather that it reflects a difference in processing type. These results, then, can be taken to support the hypothesis that high-frequency inflected verbs are stored in the lexicon while low-

frequency inflected forms are produced by combining a template for past *-(ɨ)d* to a base verb form.

Similarly, we can postulate two cognitive mechanisms by which a phrase such as *I don't know* can be produced. In one case, the expression is a construction and accessed whole from storage, and it thus includes reductions and coarticulations that have accumulated in its representation; in the other case it is put together from two (*I don't* and *know*) or three (*I*, *don't*, and *know*) elements, in which case the vowel of *don't* will not be reduced, though flapping can occur.[5] As with the past tense, these alternate means of access do not necessarily correspond to different degrees of semantic compositionality.

However, it has also been proposed in this model that stored units that are of high frequency of occurrence will be more autonomous from related units in storage, accounting for the fact that derivationally or inflectionally related words that are of high frequency are more prone to split off semantically from related words (Bybee 1985). For the phrases studied here, this means that with higher frequency of the unit as a whole, the function may deviate more from the function of the phrase as composed of three lexical units. This is precisely what is found in the data studied here. As Scheibman (i.p.) has shown there is a high correspondence between the reduced version of *I don't know* and a special discourse function that is independent of the meaning of the phrase as a sum of its parts. A similar case can be made for the phrase *I don't think*, which is not used to literally mean that the speaker has failed to generate cognitive activity, and for *why don't you* when used in making suggestions.

5. Constituent structure

Let us look more closely now at what the data suggest about the constituent structure and storage of expressions containing *don't.* What we find is that where *don't* is used in a frequent phrase, it is more likely to occur in its most reduced form (with a flap and reduced vowel), and in these pronunciations it is often the case that the negative auxiliary does not contribute compositionally to the semantics of the expression. That is, in its reduced form in frequent collocations, *don't* does not always literally mean *do not*; rather, the entire phrase can convey less analytically derived, discourse-dependent meanings. Such distinctions in function among phrases containing the negative auxiliary provide important evidence that constituent structure is subject to the same phonological, semantic, and functional usage factors that affect lexical items undergoing processes of grammaticization. Additionally, the discovery of divergent functional-phonological correspon-

dences for expressions whose elements reflect different degrees of bondedness is amenable to a processing and storage model that allows differential treatment of the SAME lexical item or phrase depending on its meaning, its pronunciation, and its linguistic and conversational contexts.

I don't know

Of the 37 total tokens of *I don't know* in the corpus, only eight contain full vowel variants of *don't* (two with a stop and six with a flap), whereas 29 of these usages are schwa forms (24 pronounced with a flap and five with just the reduced vowel). In other words, in 95% of *I don't know* tokens, *don't* is pronounced with either consonant or vowel reduction or both, and for 78%, the auxiliary is articulated with a reduced vowel.[6] In this frequent expression, then, there is consistent phonological reduction of the negative auxiliary.

With respect to their functions in conversation, all variants of *don't* in *I don't know* are able to express the compositionally transparent meaning of not having knowledge about an entity or a proposition, as illustrated in (1).

(1) (Sexual practices)
O: well but that's interesting,
because I was telling F,
I `don't `know ˆany ˆwoman,
[dõt]
that I've discussed it with,
who hasn't tried it. (B2.434O)

Seven out of eight of the full-vowel variants participate in this function of verb negation, as do 12 out of the 29 reduced vowel forms. *I don't know*, then, pronounced in varying degrees of reduction may express a speaker's lack of knowledge about a given entity, event, or proposition. On the other hand, one out of the eight full-vowel variants of *don't* in the expression *I don't know* — a token pronounced with a flap — and 17 out of the 29 schwa variants in these constructions perform more pragmatic functions in discourse. Specifically, these uses of *I don't know* in conversation express a more subjectified meaning of *not knowing* by conveying a speaker's uncertainty toward a proposition or an extended stretch of talk.[7] For example, in (2), Z's *I don't know* is uttered rapidly as one unit (marked allegro in the transcript) after her narrative and right before a speaker change. In this context — and also in six out of seven similar usages of *I don't know* in the corpus that occur after usually

lengthy stretches of talk — the speaker appears to be politely and deferentially opening up the floor to other participants. Östman (1981) notes a similar use of *I don't know* that expresses speakers' uncertainty about their contributions and can function as a floor-yielding device.

(2) (Getting old)
Z: well I talked to a guy that's thirty-four in my class,
and we were talking about the difference,
just in .. physiology and how you feel,
and your best study hours,
and [the ..] rest you need versus what you do,
O: [right]
Z: <A *I don't know* A>
[rə]
it's just --
O: right
S: you know what was the biggest give away for me?
I couldn't --
I can't get loaded anymore.
Z: uh huh.
All: @@@@
S: I mean without paying. (G1.76Z)

Similarly in (3), O's *I don't know* does not convey a lack of knowledge about an entity or proposition; rather her *knowing* or *not knowing* is dependent on her own future action, which has interactional consequences. As S's request — *will you finish the salad?* — favors an affirmative response from O (i.e. it is directed toward the salad's getting eaten up and not whether or not O actually wants more salad), the speaker's *I don't know. not now.* softens her negative response.

(3) (Dinner)
S: you don't get any more asparagus,
cause I gave it all to Z.
N: that's okay.
O: @@@
S: how about salad?
N: nope I'm great.
S: no salad?
O will you finish the salad darling?
O: *I don't ˆknow.*
[ɾ̃o]
not now. (G2.464O)

Table 3. *Full-vowel and reduced-vowel variants of* don't *in* I don't know *by lexical versus pragmatic function*

	Full vowel	Schwa
Lexical sense	7	12
Pragmatic function	1	17

In summary, though all variants of *don't* in *I don't know* convey the phrase's lexical sense of *not knowing,* only reduced forms (one token with a reduced consonant and 17 tokens with reduced vowels) express the construction's more pragmatic functions of indicating speaker uncertainty and mitigating polite disagreement in conversation, as shown in Table 3.

I don't think

The second-most frequent use of *don't* in the corpus is in the expression *I don't think* (19 occurrences of *I don't think* versus 37 of *I don't know*); it is also the second-most frequent site for reduced *don't.* As is the case for many tokens of *I don't know*, *I don't think* conveys a meaning in conversation that is noncompositional; that is, when speakers use this expression they are not expressing an inability to mentally formulate or ponder something. Unlike the case of *I don't know*, however, which may be used to indicate a lack of knowledge about something, speakers never use *I don't think* to convey the lexical sense of *not thinking.* This meaning is expressed by the verb *to think about*, as illustrated in (4).

(4) (Bad water)
O: I'll never drink out of the water fountains,
I mean they're so horrible,
the [stuff] tastes carcinogenic.
Z: [really]?
oh my god.
O: it's really horrible @@.
so .. if I take this stuff,
I'll drink it but,
I don't `think about ˆtaking it. (G2.557O)
[ɾõn]

For all *I don't think* tokens, speakers convey an epistemic stance toward some elaborated or pro-complement (e.g. *I don't think so*), as illustrated in (5). And as is the case with pragmatic uses of *I don't know*, *I don't*

think allows speakers to hedge and manage polite disagreement in conversation (Thompson and Mulac 1991).

(5) (Bed and Breakfasts)
S: you guys need some capital,
I keep saying.
F: we need the Mormon church behind us.
O: oh?
S: <A how'll you get them A>?
F: how?
O: <@ yeah *I don't think* they'll ˆgo for your ˆfantasy @>.
[ɾə̃]
(B1.92O)

I don't think always has scope over an entire clause, so that what is negated is the following complement, and not the verb in the construction. In other words, for *I don't think* + complement constructions, *don't* does not negate the verb *think* but rather the proposition in the subsequent clause. Though *I don't think* is a frequent site for reduced *don't*, unlike *I don't know*, there does not appear to be a form–function correspondence between variants of *don't* in *I don't think* and its meanings and uses. That is, though the meaning of *I don't think* is compositionally unanalyzable in conversation — indicating a more grammaticized unit — there is no consistent formal reduction concomitant with this functional shift as we saw for *I don't know* (i.e. we find in the data both full and reduced variants of *don't* in *I don't think*).

Why don't (you)

In the data, *don't* occurs eight times in interrogatives: twice in *don't you think* in which it is not reduced, and six times in *why don't (you)*. In this latter phrase *don't* is in its full form once and occurs with a flap four times and with a reduced vowel once. It is admittedly a small number of tokens, but the distribution of variants appears to be significant. Five of the instances of *why don't (you)* are not actually questions, but rather suggestions, as seen in (6) and (7).

(6) (Dinner)
O: *why don't* you `take ˆone,
[ɾõt]
before I pass it? (B1.53O)

(7) (Office hours)
S: she asked me a question,
I say,
no that's not ˆone question,
so I started telling her how it's--
Z: hmm.
S: more than one question.
I said *why don't* you sit ˆdown,
[ɾ̃ə̃]
so that I can talk to you about it. (G3.9S)

All of the suggestion uses of *why don't (you)* have a flap in *don't* and one has a reduced vowel. Worth noting is that the one case of the full form in this context occurs in an actual question:

(8) (West Texas motel)
O: now *why don't* you think that's a fantasy?
[dõ]
S: I don't `know `what's ˆfa-
[ɾə̃]
I can't imagine what would .. consti-
O: well just because you can't understand it,
doesn't mean that it doesn't exist.
S: are you a little mad at me? (B1.179S)

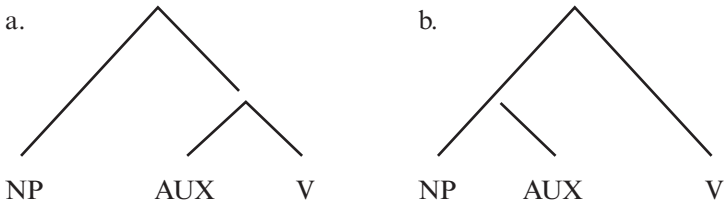
In fact, it seems that if *don't* occurs in its full form after *why* it will be interpreted as asking a question rather than making a suggestion. Thus it appears that *why don't*, when it is used for suggestions, constitutes a processing and storage unit: it has a particular range of phonetic variation and it has a function not derivable directly from the sum of its parts. Furthermore, parallel to the case of *I don't know*, the reduced form of *why don't (you)* participates in a pragmatic function of making polite suggestions versus the full form's being involved in a more propositional task of asking for information.

6. Degrees of internal constituency

Within the three-unit phrase, *I don't know*, *think*, *want*, etc., degrees of constituency exist.[8] The structure predicted by the syntactic structure would separate the subject from the verb phrase as the major constituent division, and the auxiliary would separate from the verb as a lower-level division, as shown in (9a). However, we will argue from the phonological

evidence that in these frequent phrases, and perhaps more generally in English, the constituent structure of NP–AUX–V is as in (9b).

(9) a. b.



The reduction of the vowel of *don't* is more dependent on the subject than it is on the following verb. The reduction only occurs with *I* (and in one instance with *why*), but it occurs with a variety of verbs: *know*, *think*, *have(to)*, *want*, *like*, *mean*, *care*, and *feel*. Moreover, the deletion of the flap occurs only with *I*, but with a variety of verbs: *know*, *think*, *like*, *mean*, and *feel* in this corpus.

Note also that an adverb intervening between the subject and *don't* blocks vowel reduction, as seen in examples (10a) (S's last utterance) and (10b), but an adverb between *don't* and the verb does not, as in example (11).

(10) a. (Bubbles)
N: mine was plain water,
and now it's carbonated.
I'm drinking somebody else's stuff.
O: no..you're not.
S: I don't ˆthink `so.
[r̃ə̃]
All: @@@
O: you're having [a hallucination].
S: [*I ˆreally ˆdon't `think* so]. (G2.540S)
[dõ]

b. (Sexual practices)
O: but *I also `don't `know* any..ˆone,
[rõ]
that I've discussed it with.
who enjoyed it. (B2.435O)

(11) (Coming of age)
Z: you had all the feelings,
but you just,
didn't play,
you didn't--
you just ignored it.

S: so you were just horny anyway,
so you might as well fuck men.
Z: yeah .. well .. I--
I--
I don't even ˆknow,
[ð]
if I was `really all that ˆhorny. (G3384Zb)

The greater dependence of *don't* on the subject is possibly part of the general tendency in English for auxiliaries to lean on the subject, as evidenced by contractions such as *'ll*, *'s*, *'ve*, *'d*, *'re*. This proclivity in English is in accordance with Halliday's (e.g. 1994) positing of the mood element. In Hallidayan systemic grammar the mood is composed of subject plus auxiliary. This component of the clause is used by discourse participants to negotiate propositions with one another (e.g. A: *can she do it?* B: *yeah, she can*.) and may also express speaker stance, especially when the subject is first person singular or when the auxiliary is a modal.

However, given that traditionally the auxiliary syntactically and semantically belongs in the verb phrase — for example, grammatical categories such as person, number, tense, aspect, and mood typically occur with the verb — why does the phonological fusion unite the auxiliary with the subject?

Our data suggest an answer to this in terms of the number of types that occur in the position before the auxiliary versus the number that appear after the auxiliary. In the conversations analyzed here, which yielded 124 examples of *don't* in declarative constructions, only 12 different items preceded *don't* (three are adverb types), while 30 different items followed *don't* (four are adverb types). This means in actual language use, the position following *don't* is more than twice as flexible as the position preceding *don't*.

(12)	Subject	*don't*	verb/adverb
type frequency	12 (5 lexical NPs)		30 (16 verbs occurring only once)

It is also interesting to consider the transition probability in the sequence *I don't*. That is, what is the most common item to follow *I*. Krug (1998) has shown for a large corpus of British English that the most common auxiliaries to contract with *I* are also the ones that follow *I* most frequently. Therefore, we wanted to know what items follow *I* most commonly. Unfortunately, we did not have this information for

the corpus studied for *don't* reduction because only utterances with *don't* in them were transcribed. However, it was possible to use another conversational corpus with 414 tokens of *I* to count the items following *I*. In this corpus we found that the most frequent item to follow *I* was *'m* with 47 occurrences. The next most frequent item was *don't* with 44 occurrences. Krug has argued that conventionalized contractions are conditioned by frequency of cooccurrence. The reduction of *don't* after *I* could be regarded as a type of contraction, and thus conditioned by the same factors that condition contraction of the auxiliary with the subject.

The item following *don't* with the highest token frequency was *know*, which occurred 39 times; the item preceding *don't* with the highest token frequency was *I*, which occurred 88 times. Fewer items with low token frequency preceded *don't* than followed it. Five lexical noun phrases, each occurring once, preceded *don't*, but 16 verbs that occurred only once followed *don't.* That is, the class following *don't* is more open than the class preceding *don't.* The fewer types and the resultant higher token frequency of individual types creates a stronger syntagmatic relation in the storage unit. In other words, because of a higher token-to-type ratio, subject–auxiliary sequences are more entrenched than auxiliary–verb sequences.

This case is somewhat unusual because the frequency of co-occurrence does not correspond to semantic relations. Ordinarily, semantic relatedness would correspond to tighter constituent structure. Instead, in the case of reduced *don't*, we have elements joined into frequently used constructions because of their occurrence in discourse. Recall that all but one of the reduced variants of the negative auxiliary co-occur with *I*. Collocations composed of a first person singular pronoun plus a verb such as *know* or *think* may easily take on as a major part of their meaning the speaker's evaluation or construal of a proposition. The basic epistemic sense of *know* in the expression *I don't know* contributes to the construction's usefulness in discourse, not only as a conventionalized response to explicit or implied requests for information, but also as an interactional softener with scope over both linguistic and social material. We propose, then, that functional relatedness, which leads to contiguity in expression, and variation in type and token frequency lead to the behavior attributed to abstract relations of constituent structure.

Traditional methods of determining constituent structure in competence-based models tend to consider distributional properties without considering type and token frequency. Thus pronouns are considered NPs because they occur in the same positions as full NPs: before a VP, after a preposition, etc. *I* is a pronoun because it shares properties with other pronouns: it takes no determiners or other modifiers and it has

both subject and object forms. Our approach aims for a model of usage and performance, where constituents are processing units. Thus the evidence we consider here from phonological fusion and distribution in terms of type and token frequency suggests a different constituent structure for *I* plus *don't* and perhaps other auxiliaries than for full NPs plus a lexical verb or even for full NPs plus an auxiliary.

This proposal is not all that odd typologically. In many languages, pronouns affix to the verb while full NPs do not (e.g. Navajo [Young and Morgan 1980]). In other languages person/number markers fuse with modality markers (e.g. Quileute [Andrade 1933]), or pronouns and auxiliaries of tense, aspect, and modality fuse into a clitic complex (e.g. Luiseño [Steele 1981]). In all these cases, pronouns evince a different constituent structure than full NPs, and auxiliaries or other items that develop from verbs behave differently from lexical verbs.

Most recent analyses of cases where phonological processes operate across word boundaries only in certain contexts, some of which are not syntactically motivated, conclude that the relation between syntactic structure and phonological or prosodic units is at times arbitrary (Inkelas and Zec 1990). We suggest that such relations are not arbitrary, but that frequency of co-occurrence determines the application of phonological processes across word boundaries because it also determines the chunking of speech into processing units that we equate with constituents. Given the evidence we have offered here and the support from the structure of other languages, it seems to us that the claim that languages suffer a mismatch between syntactic structure and prosodic structure is the one that requires justification.

7. Conclusions

Following the many functionalists who have cited repetition as the mechanism that creates grammar (e.g. Givón 1979; Haiman 1994), we have shown that the probability that two items will be contiguous in naturally occurring speech determines their degree of fusion into constituents (see also Meillet 1912). Of course, since contiguity in discourse is determined by pragmatic and semantic factors, items that occur together will be relevant to one another. In the usual case, then, this principle will lead to the commonly occurring constituent relations — preposition with NP, adjective with noun, auxiliary with verb, and so on. However, we have also seen that not all instances of a construction have the same status in storage and processing, and not all semantic relations are expressed iconically in constituent structure. By examining cases in which phono-

logical fusion and discourse function defy the usual constituent relations, we are able to reveal the effects of frequency of occurrence in creating new constituent relations.

Our study shows that a low type frequency for each slot in a construction coupled with a high token frequency of particular items in a construction creates the tightest constituent structure. It follows that the higher the type frequency of any particular position in a construction, the looser will be its constituent bonds to other parts of the construction. This hypothesis makes predictions that could be tested on the behavior of other constructions in naturalistic data. We believe that using naturally occurring discourse data to help determine the nature of cognitive representations will yield a better understanding of the set of relationships studied under the rubric of constituent structure.

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Notes

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1. But see below how the realities of language use affect the relative openness of these classes.
2. Kaisse (1985) claims that the presence or absence of a nasal consonant or vowel nasalization in a given pronunciation of *don't* is frequently predictable based on the initial consonant of the following word. However, the conversation data do not show such systematic variation.
3. Numbers following examples locate utterances in the database. Transcription is based on the Du Bois et al. (1993) system. Stress is indicated only for the intonation units in which *don't* occurs. The following are the symbols used in this paper:

ˆ = primary stress
` = secondary stress
. = final transitional continuity
, = continuing transitional continuity
? = appeal transitional continuity
[ ] = speech overlap
-- = truncated utterance
.. = pause

(0) = latching
A = allegro: rapid speech
@ = laughter
X = indecipherable

4. Ladefoged (1975: 99–102) distinguishes two types of unstressed syllables in English — those with a full vowel and those with a reduced vowel.
5. Kaisse (1985) also argued that *don't* with a reduced vowel has a separate representation from the one with a full vowel.
6. Furthermore, 64% of the total number of reduced forms of *don't* in all declarative utterances in the corpus — those that are pronounced with a flap and a reduced vowel and those pronounced just with a reduced vowel — occur in the expression *I don't know.*
7. See Scheibman (i.p.) for in-depth analyses of these usages.
8. We are assuming, of course, that *don't* is a single unit, the fusion of two etymological units.

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