HOW USEFUL ARE CITATION FORMS IN SYNCHRONIC THAI PHONOLOGY?

Richard B. Noss
The Central Institute of English Language

Citation forms are clearly part of language, but their role in speech is a dubious one. Language in its direct communication function does not always behave as it should. Consider the following English conversation fragment.

> A: Choose a letter of the alphabet.
> B: /way/.
> A: Now pick a number.
> B: I didn't say /way/, I said /hway/.
> A: Oh. It's just a game, that's all.

Of course, B *did* say /way/ originally. Furthermore, we know that B's citation form for "Why?" is /hway/. Why then didn't he use it in the first place, instead of using his citation form for the letter "Y"? Was he too lazy to devoice the first segment of the labiovelar just in this one instance, or is this his normal way of speaking? To make matters worse, we still don't know the phonetic shape of A's citation form for "Why?"--only that he recognizes /hway/ when he hears it.

There are a number of ways in which a competent phonologist, whether of the structural, generative, or traditional school, could account for the above conversation. Different theoretical orientations would yield different results, of course, but each could provide a satisfactory interpretation of the relation between the citation form /hway/ and the variant /way/. None, however, could account for the variant unless someone had *heard or recorded it* in this kind of context in the first place.

A major point of this paper is to show that too little recording of word variants in Central Thai is being done by synchronic phonologists, and that far too much reliance is being placed on citation forms.

Historical and comparative Tai phonology must obviously confine itself, for the most part, to citation forms of individual words, because the typical investigator has little enough access to data on the actual forms of lexical items as uttered in connected discourse by living speakers, and none at all, except by inference, to those preserved in written records. Citation forms are even useful in pedagogy. For example, they can help to establish tone, consonant, or vowel contrasts more easily for the foreign learner. They provide a better basis for decoding the writing system than the actual forms of running speech could ever do. Whatever the frequency of true citation forms in connected Thai discourse is, therefore, such forms are well worth investigating in their own right.

But the skilled teacher of Thai as a foreign language does not normally confine his instructional models to citation forms, and the historical phonologist is grateful for any information he can get about variant pronunciations of individual words, whether or not conditioned by occurrence in longer utterances. Obviously, the investigator of synchronic Thai phonology should be even more concerned with running speech forms than the teacher or the Tai philologist. Yet in too many cases he ignores them, and concentrates on the more easily described citation forms.

In the special case of the experimental phonetician, this neglect is understandable, because he finds it much more practical and productive to apply his rigorous methods to single words, phrases and short sentences in the citation mode, as opposed to long communication exchanges among native speakers. But the non-instrumental phonetician has no such excuse.

As it happens, pure citation forms are surprisingly rare in running Central Thai speech. The faster the tempo, the less frequent they become. But the chief "distortion" factor affecting citation forms, the one that yields the most predictable variants, seems to be rhythm rather than tempo. Rhythm interacts with vowel quantity and quality, stress, tone, and even consonant articulation in various ways, yet it is one of the least studied aspects of Central Thai prosody.[1]

1. Vowel Quantity

There is no single aspect of descriptive Thai phonology which illustrates the questionable validity of citation forms better than vowel quantity. Every synchronic description of Central Thai by linguists[2] specifies a long-short distinction for the nine basic vowel phonemes in citation forms. Although phonemic treatments of vowel lengths differ--e.g. /aa/ or /a:/ for the long version of /a/; /ă/ or /ʾ/ for the short version--there is no disagreement about the facts of vowel quantity in minimal pair situations. Abramson (1974) has made an experimental study which seems to confirm this analysis. His data show a constant ratio of about 2.5 between long and short versions of the same vowel, with clear separation between the two ranges. But this applies only to citation forms.[3]

Two factors muddy up the vowel quantity picture when we come to forms in running speech. The first is a failure by some phonologists to discriminate between (unpredictable) lexical variants and (predictable) phonological variants. Thus the often-cited example of น้ำ "water," which is pronounced /ná:m/ by itself but /nám/ in compounds like น้ำมัน "oil," tells us nothing about what happens to ร้าน "store," which also has a long vowel /a:/ and high tone in isolation: /rá:n/. As a matter of fact, the vowel of /rá:n/ *does* get shortened in compounds in a predictable way, but not as much as the vowel of /ná:m/. A "phonological rule" which applies to only one, or a small set of lexical items need not concern us here. We are interested in

rules which are applicable to syllables, or sequences of syllables, under clearly stated phonological conditions.

A second confusing factor is that the long-short vowel distinction is not only relative, like all quantity distinctions, but the basis of vowel length comparison may extend over only a short span--a phrase, or rhythmic unit--rather than over a whole utterance. For example, the compound ผู้หญิง "woman, female" has a citation form /phûː yǐŋ/, in which the vowel of the first syllable is absolutely longer than the vowel of the second. But almost any occurrence of the compound as a constituent of a longer phrase calls for automatic syncopation of the first syllable. Thus in เด็กผู้หญิงพูด "girls spoke" /dèk phû yǐŋ phûːt/, even if the "long" vowel of /phû/ is still perceptibly longer than the "short" vowels of /dèk/ and /yǐŋ/, it is apt to be much closer in quantity to those vowels than to the genuinely long vowel of /phûːt/. It would be extremely arbitrary to say, on the basis of quantity comparison over a longer span or a whole utterance, that the vowel of /phû/ is "long."

Two recent experimental studies of vowel length in Central Thai shed some light on this second source of confusion. Abramson (1974, 82), besides comparing minimal pairs in the citation mode, sampled vowels chosen at random from an unrehearsed narration. He found that his 2.5 ratio between corresponding long and short vowels of citation forms still held up, but that the actual ranges of duration now overlapped: 35-120 milliseconds for the short vowels versus 110-300 for the long ones. Recognizing that a more thorough study of the long-short contrast would require attention to environmental conditions, including rhythm, Abramson considers these results "striking" (presumably, surprising in the sense that he had expected a change in the ratio and a much greater overlap).

In a study published earlier, Sittachit (1972) found an average ratio of 1.75 between long and short /a/ in minimal-pair citation forms. The discrepancy between this ratio and Abramson's 2.5 is probably explained by the fact that about half of the latter's minimal pairs involved final stops, while Sittachit had only one such pair (ratio 2.6) in her shorter list. (Her single pair of vowels, as against Abramson's six pairs, may also have been a factor.) Sittachit's long and short /a/ ranges did not overlap in citation forms: 130-330 milliseconds for /a/ as against 340-450 for /aː/. These figures should be compared with Abramson's 60-150 to 160-330 in a carrier sentence. Although the presumed faster tempo of the carrier-sentence frame reduces both the long and the short vowel duration ranges, note that the gap between the ranges is identical with Sittachit's: 10 milliseconds.

So far, the experimental results suggest support for the thesis that we need to know only the tempo of the utterance to establish relative vowel quantity as a feature of Central Thai. Even Abramson's small overlap in running speech can probably be accounted for in this way. The experimental data on vowel quantity to this point can be summarized as follows:

Inferred Tempo	Example	Short Vowel Range	Long Vowel Range	Ratio
Slow	Sittachit's citation forms	130-330	340-450	1.75
Medium	Abramson's citation forms (in carrier sentences)	60-150	160-330	2.5
Fast	Abramson's random sample (in running speech)	35-120	110-300	2.5

When we consider the second part of Sittachit's study (1972, 30-31), however, we see that tempo will no longer serve as a conditioning factor for the variation in absolute range. Three of the original minimal long-short pairs were placed at the beginning of short sentences, and the vowel durations were re-measured. In spite of the fact that the pairs still had some of the characteristics of citation forms (since speakers, no matter how unsophisticated, could hardly remain unaware of the intended contrast as they pronounced otherwise identical sentences), the results were now as follows:

Short Vowel Range	Long Vowel Range	Ratio
130-190	160-250	1.5

The reduced ratio is not really a problem. After all, it is conceivable that a length distinction could be maintained with an average ratio of only 1.5. But the overlap of 30 milliseconds in the ranges of supposedly long and short vowels *in parallel contexts* cannot be shrugged off. For example, the "short" vowel of /khàw/ in /khàw khǒ:ŋ khraj/ "Whose knee?" was found to be longer in absolute terms (190 msec) than the "long" vowel of /khǎ:j/ in /khǎ:j na:li̇ka:/ "sell watches" (160 msec). Since /khàw/ occurred in a phrase of three syllables, and /khǎ:j/ in a phrase of four syllables, rhythm rather than tempo is suggested as a determining factor.

As Sittachit puts it, "The duration of any vowel depends on *its phonetic environment.*" We need only to expand and qualify this observation in terms of rhythmic analysis[4] in order to state the crucial point: "Apart from citation forms, the judgment of a vowel as long or short cannot be made without reference to the duration of the entire syllable in which the vowel occurs in comparison with the duration of neighboring syllables."

This assumption, if verifiable, would account not only for the overlap noted by Abramson for vowels in running speech, but also for the surprising fact that his 2.5 ratio remained unchanged. That is, in a sample much larger than Sittachit's, the differences would tend to average out: rhythm factors should yield just as many supershort vowels as long vowels reduced in length, and just as many extralong vowels as stretched short ones. Thus the essential vowel quantity distinction recognized by all synchronic descriptions of Central Thai could be maintained, perhaps, by specifying that the duration of

the vowel is relative to the duration of the entire syllable in which it occurs, and to nothing else. This in turn would require a thorough study of the rhythm of phrases of various numbers of syllables, and could not conceivably be based on a study of citation forms, or even on random samplings of running speech.

2. Stress and Tone

The validity of examining citation forms to determine phonological features of stress and tone in Central Thai is also questionable. Like vowel quantity, stress and tone features are relative to the syllables in which they occur. It should be obvious that not all the relevant types of Central Thai syllables occur in isolation. Again, it is rhythm rather than tempo which yields the most variants.

Abramson (1962) and Erickson (1974), among others, have conducted extensive experimental studies of tone frequencies, using both natural and simulated speech. Such studies not only concentrate on citation forms (or nonsense syllables in the citation mode) but also explicitly focus the attention of the informants, speakers and hearers alike, on the tone contrast itself. This is a little like asking Speaker B of our original English example whether he can distinguish "Why?" from "Y," and if so, exactly how does he do it. There is no question that this kind of research is valuable. But in describing the phonology of running speech, we need to ask not *can* he distinguish the two words (we already know he can), but *does* he distinguish them, and if so how and under what circumstances.

It is comforting to know, from experimental evidence, that Central Thai does indeed have five distinct tones in citation forms, and that the pitch placement and contours of these tones are very much as described by competent modern observers without benefit of electronic aids. The experimental work is valuable, also, in that it tells phonologists where to look, or not to *look, for distinctive features in* running speech. But this is where it stops. Experimental evidence to date tells us nothing about tone variants under different conditions of stress, rhythm, and intonation. This again becomes the job of the non-instrumental phonologist.

The same two factors which muddy the otherwise clear picture of vowel quantity are also at work with regard to tone and stress. First, the phonologist must distinguish between (unpredictable) lexical variants and (predictable) phonological variants. A rule which "derives" high-tone forms /kháw/ and /chán/ from citation forms with rising tone /khǎw/ and /chǎn/ for "certain pronouns" like เขา and ฉัน covers only a few word variants, even if it is a correct rule in the first place.[5] It tells us nothing about what happens to pronouns like ผม /phǒm/ and หนู /nǔ:/ in running speech, or to rising tones generally. In similar fashion, rules about word-stress which are based on citation forms have to be kept separate from rules about phrase and sentence stress. For example, Hiranburana (1972, 25-26) includes under "unaccented sylla-

bles" the non-final syllables of polysyllabic words and the first sylla-
bles of institutionalized compounds. These definitions are fine, pro-
vided we know in advance what a "word" and an "institutionalized com-
pound" are.

But how does one account for the perceptibly *different* stresses
one hears on the first syllable of โรงเรียน /ro:ŋrian/ "school" in ex-
pressions like เรียกว่าโรงเรียน /rîak wâ: ro:ŋrian/ "It's called a school"
and เดินไปโรงเรียน /dɤ:n pay ro:ŋrian/ "Walk to school"? Whether
/ro:ŋrian/ is an "institutionalized compound" or not, it certainly
behaves differently in different phonological contexts, and its stress
pattern cannot possibly be covered by a single rule.

The second source of confusion is that the levels of stress and
pitch observed in citation forms are, like the quantity of vowels, re-
lative rather than absolute. One must always ask: relative to what?
As it happens, all Thai syllables which are not citation forms or
parts of citation forms occur in the intonation contours of running
speech. Not a great deal is known about Central Thai intonation, but
it has been observed that at least one contour runs steadily downhill.[6]
That is, there may be a steady diminution of fundamental frequency over
time. Within phrases, moreover, rhythmic grouping affects stress, and
stress in turn affects not only the placement but also the actual con-
tours of tone.[7] Thus it is quite unusual to find a Thai syllable in
running speech which closely resembles a citation form unless it comes
at the end of a *rhythmic phrase, and even then the intonation contour*
may have depressed the fundamental frequency well below the starting
point of the citation tone.

What are the implications of all this for the phonologist who
is attempting a synchronic description of Central Thai? It seems clear
that, as in the case of vowel quantity, a frame of reference other than
the citation form is needed. Possibly one could state the necessary
assumption as follows: "Apart from citation forms, the judgment of
the levels and contours of both pitch and stress cannot be made with-
out reference to the levels and contours of neighboring syllables."

In at least one case, moreover, this assumption may need to be
applied to citation forms as well: the discrimination of mid and low
tones in isolation. Noss, (1964, 19) implied that native speakers
could not always hear the difference between such pairs as /lom/
"wind" and /lòm/ "mudhole," even in a citation context, unless ad-
jacent syllables gave a clue to the relative pitch levels involved.
In other words, it was observed that the mid and low tone *contours*
overlap. Abramson (1962) seemed to refute this, but more recent data
from Erickson (1974) can be interpreted as confirming it. It would
appear that, while individual speakers keep the mid and low tone con-
tours distinct, there may be little or no differentiation of these
contours *between* speakers.[8]

At any rate, once the data about pitch and stress in running
speech has been collected, it seems quite likely that meaningful

phonological rules can be stated which relate running speech forms to their corresponding citation forms. This has by no means been accomplished as yet, however.

3. Vowel Quality and Consonant Variants

To a somewhat lesser extent, even segmental features of Central Thai are affected by syllabic features such as stress and vowel quantity, and by longer-span features such as rhythm, tempo, and intonation. Harris (1972) gives a thorough account of phonetic variants of Central Thai consonants. But a satisfactory account of vowel quality and consonant characteristics cannot be based on citation forms alone. Two examples will suffice to illustrate this assertion: the three-way distinction among stops and the quality of "short" /a/.

The existence of three kinds of stop in syllable-initial position and only one kind of stop in syllable-final position in citation forms has been recognized in some fashion by every phonological description of Central Thai, with differences only in the phonemic interpretation of the stops involved. Abramson (1965, 1972) cites experimental evidence to insist not only that the two--and three--way distinction among initial stops can be accounted for exclusively by voice onset time, but also that the three final stops (labial, alveolar, and velar) *must* be aligned with the voiceless (unaspirated) members of each series, i.e. /p, t, k/.[9] As we shall see, this argument cannot apply to the facts of running Thai speech, but even from the point of view of citation-form Thai certain questions are raised.

First, most teachers of Thai to foreigners know that they cannot get students to distinguish a three-way set of initial stops, e.g. /b, p, ph/, by concentrating on voice onset time alone. In other words, English "bin, spin, pin" won't do the trick. Students seldom learn to produce an acceptable /p/, in fact, until they learn either to produce simultaneous glottal closure or to put more tension in the lip musculature for /p/ than for /b/ or /ph/. The firm closure, however, applied to a final labial stop, results in a queer-sounding syllable. Second, many of Abramson's own charts, whether analyzing natural speech or responses to artificial speech, show some overlap between the voice-onset time of /d/ and /t/ on the one hand, and between /t/ and /th/ on the other hand, although there is good separation between /d/ and /th/. (For a phonologist who deals in "norms," of course, it is the peak of each distribution curve rather than the amount of overlap which counts.) Finally, in minimal pairs such as บ่อกว้าง "wide well" and บอกว่าง "said (he was) free," which by Abramson's analysis would both come out as /bɔ̀:kwâ:ŋ/ with *stress* onset presumably the only difference, one can clearly hear the difference in articulation of the two velar stops. Hence it seems reasonable to conclude that citation-form /p, t, k/ must have *some* additional phonetic feature--a feature of tenseness, of glottalization, or of something else.

Whether Abramson's trichotomy based on voice-onset time will hold

up for citation forms or not, the evidence from running speech points in
another direction. In short, weakly-stressed syllables beginning with
a stop, spoken at rapid tempo, the distinction between /p/ and /ph/, /t/
and /th/, and /k/ and /kh/ breaks down almost completely. It is no ac-
cident that Central Thai dictionaries are full of variants such as ประสม
and ผสม for "to mix," and กระบวน and ขบวน for "train." In very rapid
tempo, moreover, one can hear these initials voiced as well as voiceless:
e.g. citation form /tapu:/ "nail", but /ti: dəpu:/ "strike a nail"; cita-
tion form /thahǎ:n/ "soldier" but /pen dəhǎ:n/ "be a soldier."

        Even final stops are sometimes voiced. Abramson's own data
(1972, 6-7) reveal, in a random sampling, sixteen percent of all final
stops before voiced phonemes as having some degree of detectable
laryngeal pulsing. Two of these cases presented "a convincing mirror
image of the situation in word-initial voiced stops"--both were in-
stances of the expression /phû:ddûəy/ "to talk with someone." We have
no way of knowing whether similar expressions which occasionally show
voiced stops, such as /ì:glɛ́:w/ "again" and /sɯ̀:bnɯ̂əŋ/ "handed down"/,
occurred in the data, but it is significant that the two convincing
examples fulfilled the conditions impressionistically observed by
Noss (1964, 10-13) in that the stop followed a high vowel.

        What are the consequences of regarding the phenomena of the
preceding paragraph as "aberrations" from a presumed norm provided
by citation forms alone? For one thing, such an assumption will
effectively prevent us from discovering new things about Thai phono-
logy. One question we should certainly ask is, does voicing of sup-
posedly voiceless stops ever carry across rhythmic phrase boundaries?
Would เขาพูดด้วย *ever* be pronounced /khǎw phû:d dûəy/ if it meant "He
spoke, also" rather than "He spoke with someone"? For another thing,
the assumption of "performance error" will force us into arbitrary
choices of contrasting stops in cases where the citation form con-
tains an unstressed syllable. Is the "correct" form of the classifier
for trains /krabuən/ or /kabuən/ or /khabuən/? If in a certain con-
text someone says /gəbuən/, is that an aberration, and if so, an
aberration from which citation form? We need, rather, an analysis
that allows us to represent phonemically the things that *are* said,
rather than the things that might be said if everyone spoke in cita-
tion forms.

        This leads directly into the question of vowel quality. The
"short /a/" of unstressed syllables such as those in the examples
above has been described by different descriptive Thai phonologists
as anything from [a] to [ə] to [ʌ]. (From a phonemic point of view,
the last two variants wander into the territory of the citation-form
vowel of เงิน "money": [ŋɤn]). The second segment of the diphthongs
/ia/, /ua/, and /ɯa/ also has been described as falling in this range;
likewise unstressed forms of words where the first segment of these
same diphthongs has been "lost"--e.g. เสีย /sá/, ด้วย /dây/, and เมือ
/mâ/. Even two-syllable words like อาหาร "food" in which the cita-
tion form has a long /a:/ in the first syllable, /ʔa:hǎ:n/, may ex-
hibit the same range of short-vowel variants in that syllable.

Given this wide range of reported vowel-quality variation, which stretches from the low front to the low back cardinal vowel points, and apparently drifts as high as [ə], yet produces no significant contrasts, what are the phonological conditions that determine the quality of the vowel? What are the effects of different degrees of stress, of rhythm, and of tone on the short vowel, or is the variation completely free? Study of citation forms will never give us the answers to these questions. It can only force us, once more, into neglect of detail and into arbitrary decisions. For example, should the intermediate citation form for "train" be /krabuan/ or /krəbuən/, alongside the absolute form /krà?buan/?

Whatever phonological analysis of Thai stops and short vowels in running speech is adopted, it cannot possibly be as over-differentiated as the phonology of citation forms. Nor can we automatically predict the forms of running speech from citation forms without first looking at the evidence.

4. Summary

Pure citation forms are relatively rare in connected Thai discourse. Syllabic features such as vowel quantity, tone, and stress in Central Thai, and to a lesser extent segmental features also, are affected in running speech by the tempo, rhythms, and intonations of an utterance. Rhythm seems to be the single most important factor in determining those word variants which are predictable. Vowel quantity, tone, and word-stress are often analyzed, both instrumentally and impressionistically, as they occur in citation forms, with the expectation that all running speech variants of these citation forms can be generated or deduced by means of phonological rules.

It is quite possible that all the common obligatory and free word variants of Thai can be derived by phonological rule (in the structural, generative, or traditional sense) from a basic list of citation forms. This can never happen, however, until the running speech or "surface" forms have been adequately recorded in all kinds of contexts. Also, true phonological variants must be rigorously distinguished from lexical variants in the formulation of such rules. Much recent work on Thai phonology lacks validity in one or both of these respects.

NOTES

[1] Noss (1972) discusses past investigations of Thai rhythm and suggests a technique for its analysis.

[2] For example, Haas. (1974), Gedney (1947), Noss (1954), and Kruatrachue (1960), among others

³ Some of Abramson's examples were put in the frame ผมพูดคำว่า____
ให้คุณฟัง. These are still citation forms, however, because the
contrasted item is set off in a phrase by itself. The framing
sentence gives the hearer information only about tempo, not
about rhythm.

⁴ Cf. Noss (1972, 37-38)

⁵ For example, Whitaker (1969) as quoted by Hiranburana (1972).
For many Thai speakers the *citation* forms of these two pronouns
also have high tone, and for some speakers the high tone is dif-
ferent from the normal high tone in other citation forms.

⁶ Noss (1964, 7) Anyone who doubts the existence of this contour is
urged to record a minute or so of continuous Thai discourse and
then play the tape backwards.

⁷ Hiranburana (1972, 26-27) summarizes changes in pitch contours of
unaccented syllables, comparing them with citation-form contours.

⁸ Erickson's male speaker PT's mid tone contour slopes gently down
from 149 to 101 herz, with no rise or fall indicated at the be-
ginning of the contour, while her female speaker SS's low tone
slopes in a very similar contour from 248 to 200 herz. Another
speaker, MJ, has almost identical beginning and ending fundamen-
tal frequencies for both tones (147-128 for mid tone vs. 146-129
for low), but the contours are clearly different.

⁹ This latter position agrees superficially with that of Brown
(1965) and Harris (1972), both of whom say, however, that the
unaspirated voiceless stops are also glottalized.

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