The Autonomy of Tenseness as a Feature

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ABSTRACT

The feature tenseness has long been a controversial issue. Many scholars have hardly accepted tenseness as a distinctive feature, due to the absence of its consistent and objective phonetic evidence especially in English. Instead, they claim that voicing is the primary feature and even say that no other feature can be independent of voicing. However, voicing feature does not explain everything and significant aerodynamic and physiological correlates of the feature tenseness have been reported in English as well as in some other languages that have the tense/lax distinction in their obstruents. It is suggested that voicing is a simple and direct feature while tenseness is a complex and indirect feature and its autonomy as a distinctive feature should be acknowledged. This will enable us to describe the phonetic reality more properly across languages as well as in individual languages.

Keywords: Tenseness, Abstractness, Complex and Indirect Feature, Autonomy

1. Introduction

The feature tenseness is a useful and necessary concept in phonology. But the use of the term is likely to have been limited to a few languages. It may be due to the lack of consistent and reliable phonetic correlates of the tenseness feature especially in English, and the general belief that voicing is the primary feature and it can replace tenseness despite the claim that the feature tenseness is autonomous. However, the attempt to explain everything with voicing feature is ignoring of the phonetic reality and an oversimplification of phonology. Through a deep review of the literature and discussion, we will criticise the negative views on tenseness and support its autonomy as a feature. In addition, the nature of tenseness and the benefit of its acceptance will be suggested.

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2. Controversy over the Feature Tenseness

Since Jakobson, et al. (1952) applied the feature tenseness to English stops and fricatives, the dispute over the feature has inevitably been given increased attention by linguists and phoneticians. Their views are, in general, divided into two opposing stances. First, it is well known that many researchers have denied the identity of the feature tenseness, or have been reluctant to accept it as a distinctive feature. Their negative claim stems mostly from the absence of the consistent and objective phonetic evidence with respect to the so-called force of articulation. So they would even say the notion of force of articulation is merely a hypothesis or a product of imagination. For instance, Lebrun (1970, p. 129) argued that "Until these [mere] hypotheses [basis of articulation and force of articulation] are verified by reliable measurements, we would perhaps do well not to use them when teaching a foreign language or trying to explain phonetic changes." A similar opinion is suggested by Catford (1977). But, unlike Lebrun who denied the tenseness feature completely regardless of languages, Catford was careful to focus his objection to the feature tenseness mainly on English. He generally acknowledged that tenseness might cause the durational differences in English consonants and their preceding vowels, but expressed his view against tenseness, indicating that other correlates relating to tenseness such as more energetic articulation and high air-pressure, etc. did not prove consistently distinctive between voiced and voiceless consonants. Instead, he defended voicing as the primary feature in English obstruents even when no real voicing exists, and suggested vocal fold adduction as the phonetic cue for the voicing feature. And he insisted that "there is no need to invoke a dubious and ill-defined concept of 'tenseness'" (1977, p. 112). He confirms his negative view on tenseness in some other western European languages as well, such as French, Danish, and Swedish, based on the fact that studies of tense/lax distinction were inconclusive due to only slight differentials in articulatory pressure and intra-oral air pressure. As opposed to some western languages including English, he acknowledges, if carefully, that some languages including most of the eastern Caucasian languages, Korean, and Javanese have "some kind of tense/lax distinction that appears to be quite independent of voicing" (p. 202). In addition to the above authors, Pike (1943), Reeds & Wang (1961), Lisker (1963), Lisker & Abramson (1964, 1967) and Jaeger (1983) also argue against the feature tenseness. Pike (1943, p. 128) mentioned the tense/lax distinction is "a convenient fiction". Reeds & Wang (1961, p. 78) said that the tense/lax distinction is "too impressionistic to be

experimentally useful". Lisker (1963) denied the autonomy of the tenseness feature stating that "there has been no very convincing demonstration that tension and voicing, ..., are fully independent dimensions of phonetic description; ... discussion of their relative status as distinctive features may be void of meaning." (p. 387). In line with this, Lisker & Abramson (1964, 1967) strongly supported the feature voicing as the primary feature, insisting that "certainly none of the acoustic features which have been suggested as correlates of a fortis/lenis dimension is demonstrably independent of voicing" (1964, p. 387), and that "Among the dimensions which the phoneticians find useful in organizing his description of speech sounds none has a more prominent place than voicing." (1967, p. 1). In a study to find some evidence about the tenseness feature from Zapotec and Jawoñ which are regarded as having a tense-lax distinction, Jaeger (1983) insisted that the feature tenseness could be used only in some languages which do not have a voicing or VOT contrast, and even in that case, "they should always be accompanied by a careful explanation of the phonetic properties of the segments...." (p. 188).

In contrast, not a few scholars have supported the feature tenseness and tried to find out some reliable phonetic cues to the feature. Delattre (1941) scaled the degree of the force of articulation in French consonants (i.e., from 0 to 100), using the durational differences of the preceding vowel /E/ due to the following consonant type. According to his classification of the force of articulation in French consonants voiceless simple consonants /p, t, k/ are 95 and voiced /b, d, g/ are 52.5. Through a series of experimental and instrumental studies (e.g., 1970), Malécot claimed that the force of articulation is a more fundamental characteristic than phonetic voicing in distinguishing the so-called phonologically voiced and voiceless consonants. In a study to investigate the differences between French /p, t, k/ and /b, d, g/, Fischer-Jørgensen (1973) concluded that French /p, t, k/ and /b, d, g/ could be distinguished by the force of articulation as well as the feature voicing. Hence, the feature tenseness was treated as an independent feature. She added that perceptually one of the two features (i.e., voicing and tenseness) does not have priority over the other: "On ne peut pas encore dire lequel est le trait primaire du point de vue de la perception" (p. 196). In another document (1972), Fischer-Jørgensen proposed some observations as the bases of her idea that the force of articulation is an independent dimension: (1) in French the assimilation of sonority is not necessarily accompanied by an assimilation of force (c.f., Malmberg, 1943) (2) in Swiss German the difference between tense and lax presents itself as an isolated phenomenon (3) Korean stops are best described by using the feature tenseness.

etc. As is well known, Kim's (1965) study – On the Autonomy of the Tensity Feature in Stop Classification (with Special Reference to Korean Stops) – must be recorded as a milestone for the dispute over the feature tenseness. The instrumental study at least clearly indicated the fact that there exists the feature tenseness against the idea, which some linguists and phoneticians had, that the hypothesis of tenseness is a mere fiction or imagination. Hardcastle (1973) obtained air-flow and acoustic data from Korean initial stops in isolated words and suggested that isometric muscular tension in the vocal cords and pharynx can be used as the correlate of the tenseness feature. Through an electromyographic (EMG) study of Korean initial stops, Hirose, et al. (1974) concluded that "at least for Korean stops, the laryngeal articulatory adjustment is not limited in a simple dimension of adduction – abduction of the vocal folds...." (p. 152), and suggested another dimension such as thyroarytenoid activity should be considered. Other researchers also base their studies on the tense/lax distinction in Korean obstruents (e.g., Han & Weitzman, 1970; Abberton, 1972; Kagaya, 1974). Besides Korean, there are some other languages where the feature tenseness has to be used in describing their consonantal systems (e.g., Vietnamese, Javanese, and Potou Lagoon languages). Especially, Cama stops are distinguished by both voicing and tenseness features: voiced fortis, voiced lenis, voiceless fortis and voiceless lenis (Maddieson, 1974). Therefore, Cama can be regarded as a representative case to show that the two features (voicing and tenseness) are basically independent, and it is a critical counter example to the argument that the feature voicing can replace the feature tenseness. With regard to the correlates of tenseness, Debrock (1977), who carried out research concerning Korean, French and Dutch obstruents, suggested that the inverse relationship between the rise time of the postconsonantal vowel or the decay time of the preconsonantal vowel and the force of articulation of consonants can be considered an acoustic correlate of the force of articulation regardless of the position (initial, medial and final).

It is intriguing to encounter the argument that German does not have a distinctive feature voicing in its consonant system. Jessen (1997) asserted that German /b, d, g/ and /p, t, k/ are distinguished by the feature tenseness, rejecting the feature voicing. He proposes duration (aspiration, stop closure and preceding vowel) as the most reliable and constant correlate of the force of articulation in German stops. More interestingly, according to Jessen (1997), such a view has been widely accepted by many German linguists and phoneticians (e.g., Giegerich, 1989; Iverson & Salmons, 1995). Jessen says most of them agree to the idea that "stop voicing is

a redundant rather than distinctive feature because it is only employed reliably in (word-medial) intervocalic position" (p. 116). Of course, they suggest the feature tenseness as a distinctive feature instead of the voicing feature.

As in German, English stops do not show a consistent and reliable voicing contrast especially in initial or final position. Even the intervocalic voiced stops frequently show partial voicing, and the expectation that English voiced intervocalic stops would become fully voiced (Gleason, 1955, p. 247; Ohala, 1983, p. 199; Gimson, 1989, p. 194) is also rejected. Moreover, devoicing in English fricatives is more frequent than in stops (Ohala, 1983, 1997). Kim (1987) insisted that his experiments could only find phonetic cues for the tense-lax distinction and not for the existing voiced-voiceless distinction theory in English stops. The phonetic bases for the distinction of tense-lax that Kim proposed are the duration of preceding vowel and oral closure, maximum lingual contact and muscular tension on the vocal folds. Accordingly, he suggested replacing the voiced-voiceless distinction by a tense-lax distinction. Gimson (1989, p. 194) also has a similar opinion: "...it is generally regarded as most useful to treat the fortis/lenis distinction as primarily a phonological classification which accounts for a complex of realizational features."

3. Aerodynamic and Physiological Correlates of the Feature Tenseness

Contrary to the general belief that so-called consistent and reliable phonetic correlates of the feature tenseness in English obstruents have not been discovered (cf. Lisker & Abramson, 1964; Harris, et al. 1965; Fromkin, 1966; Catford, 1977), the following studies are surprisingly reporting some significant aerodynamic and physiological correlates of the feature tenseness. First, Smith (1997) investigated the production of /z/ and /s/ (American English) in a variety of phonological environments using simultaneous acoustic, aerodynamic, and electroglottographic (EGG) data. The results revealed that "Although many tokens of /z/ showed little or no vocal fold vibration in the EGG signal, durational and aerodynamic differences maintained the distinction between /z/ and /s/." (p. 471). Especially with regard to the aerodynamic differences, Smith reported that "The /z/'s, whether fully voiced, partially devoiced or completely devoiced, are characterized by lower airflow than /s/." (p. 498). These results may indicate that the feature tenseness is more appropriate to distinguish English fricatives /s, z/ at least than the feature voicing is,

if airflow is adopted as an aerodynamic correlate of the feature tenseness. However Lisker (1970, p. 228) argued that "For English the best that can be done is to show that there are articulatory differences other than laryngeal [operation] which are associated with differences in the voicing dimension." This view of Lisker seems to be answered by the following studies. Kim (1995) carried out an electromyography (EMG) study with reference to the feature tenseness in English and Korean bilabial stops using one American and two Koreans. He measured the peak of the EMG amplitude in μV (the *orbicularis oris* superior muscle), the duration of muscle action in ms and the duration of oral closure in ms. His findings include that the bilabial (tense/lax) stops of English and Korean were distinguished by the EMG peak amplitude except for English stops in stressed syllables. For the exception it was hypothesised that "in stressed syllables English /p/ and /b/ may be differentiated by the EMG activities from a muscle other than the *orbicularis oris* superior muscle, e.g., the respiratory muscles relating to aspiration." (p. 77). Kim (1998) went on to study the tense-lax distinction theory in English and Korean stops. In this study, 13 subjects in total, and /VCV/, /CVC/, /CVCVCV/ and /CVCVC/ words were used. His findings are (1) The EMG data, obtained from the *orbicularis oris* superior muscle and the depressor *anguli oris* muscle, supported the tense-lax opposition, except for one English subject in stressed syllables; (2) The leveled peak intraoral airpressure, an output of the synchronized respiratory muscle activities during bilabial stops, backed up the tense-lax distinction, except for one English subject in unstressed syllables, and there was intermuscle compensation between the labial muscle activities and the respiratory muscle activities; (3) The data of the maximum lingual contact in alveolar stops also supported the tense-lax distinction theory. On the basis of the results, his hypothesis – the speaker may select at least one of muscles involved in the articulation of a phoneme so that either timing or amplitude variable and/or both of the selected muscle(s) could distinguish /p/ from /b/ in English and /p^h, p'/ from /p/ in Korean. – was claimed to have been verified. On the other hand, Kim (2002) reported that English /p/ has greater pressure static time than /b/, which is also suggested as evidence in support of the tense-lax distinction hypothesis.

4. Comments on the Negative Views on Tenseness

The above claim of Lebrun (1970) (i.e., "Until these [mere] hypotheses [basis of articulation and force of articulation] are verified by reliable measurements, we

would perhaps do well not to use them when teaching a foreign language or trying to explain phonetic changes.") must be dangerous. For instance, how could we teach Korean or Cama stops without the feature tenseness? In addition to that, how could we explain the Korean timing pattern which is significantly affected by the types of phoneme (Yun, 2003: the durational ratio of neighbouring syllables and word duration significantly vary according to the intervocalic tense/lax consonant)? The advocates of the feature voicing might think it would be safe to stay within the distinction of voiced/voiceless, and have an idea that the feature voicing can replace the feature tenseness, if it exists. However, the voicing feature does not explain everything. In particular, with reference to the durational variation of the preconsonantal vowel, the feature voicing manifests itself as being inappropriate to be the cause, and tenseness is suggested its alternative at least in Korean. That is, Yun (in preparation) shows that phonetic voicing in Korean intervocalic lax consonants /p, t, k, c, s/ has no significant correlation coefficients with the duration of the preceding vowel. The length of vowel /a/ is significantly shorter before tense consonants than before their lax cognates, but the vowels before tense (unaspirated *vs.* aspirated) consonants are similar in duration. It may be possible to extend the explanatory power of the voicing feature within individual languages (e.g., the so-called underlying or abstract voicing feature would work in English irrespective of real voicing). However, such a phonological interpretation could not be a fundamental explanation for the presumably physiological and language universal phenomenon. It will be very interesting to guess how Catford would explain the preconsonantal vowel shortening in English and Korean. Would he say that the cause of the phenomenon is voicing in English and tenseness in Korean respectively? This seems likely to be the only answer he could suggest, considering his views on the feature tenseness in English and in Korean – "there is no need to invoke a dubious and ill-defined concept of 'tenseness' [in English]" (1977, p. 112) and "[Korean, etc.] have some kind of tense/lax distinction that appears to be quite independent of voicing" (p. 202). However, such an answer can not be accepted, since the presumably same phenomenon across many languages is expected to be described in the same way (i.e., voicing or tenseness), whatever the level is (i.e., phonetics, phonology). Here, it should be noted that the criticism of Catford's views on tenseness does not necessarily mean that the primary feature in English obstruents is tenseness, not voicing. The primary feature(s) will be determined according to which feature does describe the sound system more effectively, accurately and economically in a given language. Provided that in English, voicing is

more reliable and economical than tenseness, the primary feature would be voicing as it is at present, and vice versa. The point here is that we should acknowledge the existence and autonomy of the feature tenseness. The acknowledgement of the feature tenseness does not and should not mean the denial of the feature voicing, and vice versa. With regard to the autonomy of features, Kim's (1965) remark is noteworthy. That is, concluding that while the feature tenseness is primary in Korean stops, the three features – tenseness, voicing and aspiration – are all independent, Kim made a further statement that "It should be noted that I do not mean to claim that the terms voiced/voiceless or unaspirated/aspirated should be replaced by the terms tense/lax or fortis/lenis, ... but rather that both tensity and voicing are autonomous cross-cutting features of stops" (p. 357).

One may still argue that tenseness can not replace voicing as the cause of the vowel shortening phenomenon, pointing out that the force of articulation is not well defined due to the deficiency of consistent and reliable phonetic correlates. But in order to justify the argument, he/she should be able to suggest an alternative or prove that voicing (phonetic or phonological) could be the cause of the preconsonantal vowel variation regardless of languages. Many authors might have been able to avoid the exposure of the weakness of the account based on voicing, standing on the two stepping stones, i.e., phonology and phonetics (e.g., phonological voicing in English; phonetic voicing in Korean). The loss of one stepping stone (i.e., the rejection of phonetic voicing as the cause of the preconsonantal vowel variation) makes them stand 'on one leg' relying upon the remaining one stone (phonological voicing). One question is thrown to them. Where are they? It is said that the definition of the feature voicing is clear, since the phonetic evidence is the presence/absence of vibration of vocal cords (i.e., phonetic voicing). However, even when the vocal cords do not vibrate, they regard it as voicing (phonological). Therefore, unlike its definition, the reality of the voicing feature is neither consistent nor clear. Moreover, as far as the preconsonantal vowel variation is concerned, ironically voicing (vocal cord vibration) loses its qualification as the phonetic correlate of the feature voicing (phonological) which, they believe, is the cause of the phenomenon. In other words, phonetic voicing during the postvocalic consonants manifests itself as having nothing to do with the preconsonantal vowel variation even in English (Fox & Terbeek, 1977; Walsh & Parker, 1981). For example, Walsh & Parker (1981) compared vowel length in English stimuli such as "bopped" *vs.* "bobbed". The voiced consonants exhibited little voicing, whereas the voiceless consonants sometimes revealed even longer

voicing than the voiced consonants. However, regardless of the phonetic voicing in the consonants, the vowels preceding phonologically voiceless stops were significantly longer that those preceding their counterparts.

5. Tenseness as a Complex and Indirect Feature

Albeit tenseness is likely to be the cause of the preconsonantal vowel variation and its autonomy as a distinctive feature should be acknowledged, we have been aware that there is a weakness in the feature tenseness itself. That is, it has been indicated that it is difficult to suggest a consistent phonetic correlate to represent the feature tenseness. What is the reason? One reason may be ***the abstractness*** that the force of articulation has. According to The Oxford English Dictionary (1989), *force* is defined as "physical strength, might or vigour as an attribute of living beings". What is physical strength, might or vigour? How can we define it in a really physical (concrete) term? Though *force* is obviously a physical phenomenon, it must be difficult to describe it physically. Unlike voicing and aspiration, therefore, tenseness (force of articulation) has to be abstract. But the difficulty in description should not be the excuse of ignoring of the existence of the feature tenseness. Another reason would be that whilst voicing or aspiration is ***a simple and direct feature***, tenseness is ***a complex and indirect feature***. In other words, voicing and aspiration are directly realised and represented by one phonetic correlate respectively (i.e., each correlate itself is the feature), whereas tenseness can only be reflected in various correlates due to its inherent abstractness. That would be part of the reason why the feature tenseness is 'dubious and ill-defined'. There have been proposed many possible correlates of tenseness, as reflecting the great amount of efforts by phoneticians (air pressure, airflow, duration, intensity (amplitude), lingual contact area (palatogram and linguagram), tension in pertinent muscles (EMG data), and the rise time of the postconsonantal vowel, the decay time of the preconsonantal vowel, pressure static time, etc.). The problem is that the force of articulation is not always accompanied by all of its correlates. Sometimes only one or two correlates could make the distinction of the force of articulation (cf. Kim, 1998). As a result, a consistent and reliable correlate (a unitary phonetic dimension) may be difficult to be obtained in some languages. But the inconsistency and diversity should be understood as the nature rather than the weakness of the feature tenseness.

Let us take an example to have a better comprehension of ***the complex feature*** suggested above. Stress, which is one of suprasegmental features, may have up to four correlates (i.e., pitch, duration, intensity, and vowel quality) according to languages. But the correlates may not always co-vary, when a syllable is stressed. Thus, in theory a stressed syllable could be pronounced in many different ways (e.g., with variation only in one correlate: high pitch, long duration, high intensity or markedly different vowel quality; with variation in two correlates: high pitch and long duration, high pitch and high intensity). This diversity, however, causes no problem in calling the syllable stressed. Likewise, it is suggested that the tenseness feature should be understood as a complex feature, even if it is a segmental feature. In addition to that, it should be noted that not all languages have to have a tenseness contrast in their consonants, just as not all languages have a voicing contrast (e.g., Mandarin and Korean have only voiceless obstruents). Even in the languages with the tense/lax distinction, the extent of distinction and the importance (role) of the feature must be different from language to language. This would be because the tenseness feature is not an absolute feature but a relative feature, as Kim indicated (1965). Yet, the relativity should not discourage us from acknowledging the autonomy of the feature tenseness.

One may point out that if broadly defined, the feature voicing also has multiple correlates (e.g., Parker, 1977; Lisker, 1986). For example, Lisker (1986) proposed 16 acoustic properties as [voice] cues in English stops in trochee (closure duration, preclosure (vowel) duration, duration of F1 formant transition, fundamental frequency (F0), decay time of signal, release burst intensity, VOT, onset of F1 transition, and F1 onset/offset frequency, etc.). But the list of acoustic properties looks like a set containing the correlates of all the three features – tenseness, voicing and aspiration. Therefore, the acoustic properties would be the cues to identify the lexical difference (e.g., rabid – rapid) rather than the cues to the perception of voicing during the closure. Lisker himself seems to recognize this, as shown in the following remarks: "it can be argued that in order to be counted as a cue to the voicing status of the stop it is not enough that a given acoustic property should significantly determine a listener's lexical decision; it must affect a decision as to whether or not the medial closure [e.g., rabid – rapid] was or was not accompanied by laryngeal buzz, i.e., voicing."; "They (listeners) might indeed more consistently report that a stimulus pair, one labelled *rabid* and the other *rapid*, differ in their [a] durations than in the [voiced] nature of the medial stop closure. In such a case it would hardly seem appropriate to call the duration of the vowel a cue to

the voicing of the stop." (Lisker, 1986, p. 8). In particular, with reference to the consonant and vowel durations, he acknowledges that they can be the cues to the feature tenseness: "if the durational differences in closure and preclosure intervals between *rabid* and *rapid* are construed as evidence of a [fortis] distinction, then it must be granted that not all the acoustic cues to the lexical distinction can be, strictly speaking, cues to [voiced]" (p. 5). Even if we accept that all the acoustic cues are only for the feature voicing, the attempt to change the simple feature (voicing) to a complex feature could, in a sense, be interpreted as acknowledging the weakness of the feature voicing in English and as a retreat from the original clear-cut definition of voicing. In addition, the remark – "we have no right to assume a principle of 'once a cue, always a cue'" (Lisker, 1986, p. 7) – is only likely to raise a question, i.e., what is the superiority of the feature voicing to the feature tenseness in English? All in all the attempt to describe the feature voicing as a complex feature does not appear helpful to enhance its status as a distinctive feature in English.

6. What do we lose and gain?

What do we lose and gain by accepting the feature tenseness? First, the languages where voicing is the primary feature may undergo weakening of the ***simplicity*** of their grammars, as the feature tenseness, if acknowledged, has been treated merely as a redundant feature and replaced by the primary feature voicing. In contrast, they would gain more ***naturalness*** in their grammars by incorporating some phonetic facts caused by tenseness (e.g., preconsonantal vowel shortening). Second, from the viewpoint of the universal grammar, more ***generality*** would be obtained, since for instance, the same phenomenon (preconsonantal vowel shortening) across many languages would be explained in the same way.

Phonology provides the grammar in a language, but it sometimes ignores the phonetic reality. Though some abstractness is inevitable, phonology should base its theory on phonetic principles (aerodynamic, physiological and acoustic phenomena, etc.). If not, phonology would become a world isolated from the linguistic reality. In relation to this, the following two authors' remarks are notable. First, in the foreword of her book (*Suprasegmentals*, 1970, p. vi), Lehiste made an impressive comment:

> "For a linguist, phonetics is only a means toward an end, not a purpose in itself. The end is to provide reliable answers to linguistically relevant questions. However, for providing these answers, phonetics is indispensable. I believe firmly that true statements regarding phonological phenomena presuppose correct observation of their phonetic manifestation. A phonologist ignores phonetics at his own peril."

Ohala (1997, p. 693) also showed a similar view:

> "phonology should not be conducted as an autonomous discipline but rather should embrace any means that will help it to get the answers it seeks."

Simplicity is one of the targets phonology has to pursue, but oversimplification should be avoided. The acknowledgement of the autonomy of the feature tenseness will enable us to describe the phonetic reality more properly across languages as well as in individual languages.

7. Conclusion

The feature tenseness was born to apply to English obstruents, but many linguists and phoneticians have denied or at best treated it as a redundant feature. Nevertheless, tenseness feature is indispensable in the phonology of some other languages such as Korean. It is noted that contrary to the general belief, some significant aerodynamic and physiological correlates of the feature tenseness have been reported in English obstruents. Tenseness as a complex and indirect feature can only be reflected in various correlates due to its inherent abstractness, which might have made it difficult to find its consistent and reliable phonetic correlates especially in English. But this should not be the excuse of the denial of the existence and autonomy of the feature tenseness. The acceptance of the autonomy of the feature tenseness will enhance naturalness and generality in phonology.

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