

# DASAR PERBEDAAN SECARA FONETIS BUNYI KONSONAN OBSTRUENT DAN SONORAN

## THE PHONETIC BASIS FOR THE DISTINCTION OF OBSTRUENT AND SONORANT CONSONANTS

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### **Abstrak**

Menurut keberadaan aliran udara ketika memproduksi bunyi bahasa, bunyi konsonan dapat dibagi menjadi obstruen dan sonorant (Rice, 1993). Artikel ini berusaha menjelaskan perbedaan antara bunyi konsonan obstruen dan sonorant. Selanjutnya, tulisan ini bertujuan untuk menjelaskan alasan mengapa bunyi *voiced implosives*, *tap* dan *flap*, dan *trill* yang sulit untuk dikategorikan sebagai bunyi sonorant atau obstruen. Setelah membahas kedua kategori bunyi secara menyeluruh, ditemukan bahwa perbedaan mendasar antara obstruen dan sonorant terletak pada keadaan pita suara, apakah pita suara bergetar atau tidak, dan juga terletak pada aliran udara, apakah aliran udara terhambat atau terhalang. Implosif bersuara sulit untuk dikategorikan sebagai obstruen dan sonorant karena sebenarnya bunyi tersebut termasuk bersuara (*voiced*), sedangkan obstruen pada umumnya tak bersuara (*voiceless*). Selain itu, ketika bunyi ditahan dan dilepaskan membuat bunyi *flaps* dan *taps*, dan *trills* sulit untuk dikategorikan sebagai obstruen atau sonorant. Bunyi-bunyi tersebut dapat dianggap sebagai sonorant jika kita menekankan pada fase ketika bunyi itu ditahan. Namun bunyi-bunyi tersebut dianggap sebagai sonorant jika kita menekankan pada fase dilepaskannya bunyi-bunyi tersebut.

**Kata kunci:** *sonorants, obstruents, voiced implosives, trills, flaps and taps*

### **Abstract**

According to the state of airflow when producing sounds, consonants can be divided into obstruents and sonorants (Rice, 1993). This article attempts to elucidate the differences between obstruent and sonorant consonants. Further, it aims to explain the reasons why voiced implosives, tap and flap, and trill consonants are difficult to be categorized as sonorants or obstruents. After discussing the the two category of sounds thoroughly, it was found that the underlying distinction between obstruents and sonorants lies in the vocal fold status, whether it is vibrating or not, and in the airstream flow, whether it is obstructed or unobstructed. Voiced implosives are difficult to be categorized as obstruent and sonorants because of in fact they are voiced, while obstruents are commonly voiceless. In addition, the hold and release phase makes the flaps and taps and trills difficult to be categorized as obstruents or sonorants. They can be

treated as sonorants if we highlight their hold phase and as sonorants if we emphasize on their release phase.

**Key words: sonorants, obstruents, voiced implosives, trills, flaps and taps**

## **I. INTRODUCTION**

Describing speech sounds has been a subject of great debate for decades. Phoneticians have long examined sounds and classified them into groups according to their place of articulation, manner of articulation and the state of the vocal cords. Although this classification seems straightforward, it is difficult to draw a consistently clear distinction between certain speech sounds. An example of this difficulty is in the study of consonants. Unlike vowels, which are characterized by free flow of air when they are pronounced, consonants are produced by stopping air from flowing through the oral cavity. This inhibition of air for such sound production ranges from complete blockage, such as in the case of oral stops, to almost no hindrance, as in the case of approximants. As a result of this total and partial obstruction, oral stops, fricatives and affricates are marked as obstruents and conversely, nasal stops, liquids and glides are described as sonorants.

## **II. DISCUSSION**

### **A. Obstruents and Sonorants**

Phoneticians have made a distinction between obstruents and sonorants. The basis of this distinction is sonority. However, when it comes to discussing sounds like trills, taps, flaps, and voiced implosives, the distinction is not clear and the issues concerning the production of these sounds are a subject of great debate. However, it is possible to examine consonants from different points of view to determine the basis of different classification systems and to give proof as to which category or categories flaps, taps, thrills and implosives belong. Before starting such a discussion, it is important to compare the two classes, obstruents and sonorants, provide a brief description of the sounds listed under each class, and examine the basis of these groupings.

Obstruent sounds are consonant sounds that are produced by blocking the air passage, which then generates an increase of air pressure in the vocal tract (Heselwood, 1998). In other words, an obstruent sound is a sound production which involves a closure of the vocal tract that interferes with airflow. As regard to this definition, based on the manner of articulation, some sound categories which can be definitely labelled as obstruents are: stops, fricatives, and affricatives.

Stops, for example, are categorized as obstruents because they are ‘made with a complete and momentary closure of airflow through the oral cavity’ (O’Grady, 1989: 21). To produce these sounds, the velum is increased to block the airstream flow throughout the nasal cavity, and the oral airflow is then obstructed (Clark, 2007: 44). Thus, bilabial, dental, alveolar, palatal, velar, uvular, and glottal place of articulations can be categorized as obstruents. A linguist like Catford, for example, classified trill sounds as obstruent (Catford, 1988: 75). The basis of this classification is that a major obstruction to airflow happens in the production of these sounds.

As regard to the state of vocal fold vibration, obstruents are commonly voiceless. Ohala (1983), cited in Oostendorp (2011: 185), explained that obstruents ‘involve a constricted vocal tract, which for aerodynamic reasons inhibits vocal fold vibration’. For example, the blockage of airstream by the vocal tract in the production of voiceless velar [x], [χ], bilabial [ɸ], alveolar lateral [ɬ] sounds prevents the vocal fold to vibrate.

Sonorant sounds, on the other hand, refer to consonant sounds that are produced with uninterrupted airstream in the vocal fold. Chomsky and Halle (1968: 203), as quoted in Heselwood (1998), suggest that the requirement of a sonorant sound is the absence of ‘radical obstruction in the midsagittal region of the vocal tract’. Based on this characteristic, some sound categories, based on the manner of articulation, which are labelled as sonorants are liquids and nasals (Ladefoged and Maddieson, 1996: 102). Furthermore, O’Grady (1989: 46) included vowels and glides into sonorants. The reasons why glides are categorized as sonorants are due to unobstructed airstream during the production of the sounds, for example the sound [j].

Furthermore, nasals sounds [m] and [n] are classified as sonorants because the airstream is not obstructed and free from turbulence when producing nasal sounds (Catford, 1988: 77). In producing the [m] sound, for example, the lips and the oral cavity are completely closed, but the airstream is escaping through the nose because of the lowering state of the soft palate (Ladefoged and Maddieson, 1996: 102).

Regarding the state of vocal fold vibration, sonorants are mostly voiced. This implies that some sonorants in certain languages are voiceless (Oostendorp et al, 2011: 175). A stricter definition of sonorants as regards to the state of vocal fold vibration is given by Ladefoged and Maddieson (1996). Sonorants are ‘sounds with an auditory property which arises from their having a comparatively large amount of acoustic energy within a clearly defined formant structure’ (Ladefoged, 1971: 58, quoted in Heselwood, 1998: 69). This entails the understanding that sonorants should be voiced.

### **B. Phonetic Distinction between Obstruents and Sonorants**

Based on the given definition of obstruents and sonorants, apparent distinctions between obstruents and sonorants sounds lie in the state of vocal fold, whether it is vibrating (voiced) or non-vibrating (voiceless), and the airstream flow, whether it is obstructed or unobstructed. As quoted in Oostondorp (2011: 185), the difference between obstruents and sonorants ‘lie in the effect that the supralaryngeal configuration has on vocal fold vibration’.

Further, he described that, in the production of sonorant sounds, continuous voicing is possible because the vocal tract is not constricted. On the other hand, in the production of obstruents the vocal tract is constricted. This is the reason why vocal fold vibration is avoided (Ohala, 1983 in Oostondorp, 2011: 185). In contrast, sonorants categorize sounds based on the influence of their strictures on the airstream in the glottis which bring on the vocal fold vibration. (Kenstowich, 1994: 36, in Oostondorp, 2011: 186). For example, a sonorants sound like the uvular fricative sound [ʁ] is produced by ‘closing the back of the tongue against the uvula’ which results in the air flow constriction in the narrow channel between the back of the tongue and the uvula (Clark et al, 2007:40). Meanwhile, the voiceless stop sound like [t] is an apparent example of obstruent because of two things, the blockage of airstream and the state of non-vibrating vocal fold. The voiceless stop is produced by making a complete momentary blockage of airstream. When the blockage is released, a small explosion occurs because of the air burst, but this does not cause vocal fold vibrating (Catford, 1989: 17)

### **C. Voiced Implosive**

Voiced implosive sounds are defined by Ladefoged (2001:116) as “stop made with an ingressive glottalic airstream mechanism”. Ball and Rahilly (1999:16) elaborate that the

voiced implosives can be produced when the glottalic ingressive sounds might become louder because there is concurrence in the added amount of pulmonic outward airstream through the larynx at the same time with the production of inward flow of air inside the mouth.

Implosive sounds are categorized as stops. These sounds are produced by lowering the glottis which then controls the airstream. Ledefoged and Maddieson (1996: 82) explained that implosives belong to stops that are ‘produced with a greater than average amount of lowering of the larynx during the time that the oral closure for the stop is maintained’. Further, he elaborated that this type of sounds are commonly articulated with constricted setting of the vocal folds.

In more details, Catford (1988) explained the mechanism of voiced implosives or ‘voiced glottalic suction stops’. The descending thrust of the larynx plays its part to control the air pressure with initial movement. The descending movement of the larynx makes the room above the glottis expanded, and it lowers the pressure to below atmospheric pressure. Due to the lung inactivity little pressure below the larynx occurs, while the pressure above the larynx is low. As there is a little room above the glottis, the air leaks upward through the glottis into the room above it, and makes the vocal fold vibrate. This process produces the implosive sounds like [b], [d], [g].

As regard to the vibration in the vocal folds, the airstream that seeps through the glottis causes vibrations in the vocal folds, and these results in the absence of ingressive airflow on the release of the stop closure (Ledefoged and Maddieson, 1996: 82). Clark *et al* (2007: 17) added that the frequent existence of some upward leakage of lung air will cause voicing. This is because the larynx piston movement is more unlikely effective in producing ingressive airflow than egressive one due to the complexity of keeping the glottis firmly closed during the downward movement of the larynx.

Based on the given explanation of the airstream mechanism of voiced implosives, it is quite tricky to exactly categorize these sounds into sonorants or obstruents. Voiced implosives are categorized as obstruents because of the release process after the hold phase. Heselwood, (1998: 71) explained this classification in more details. He proposes this classification because of an ‘air pressure differential in the vocal tract which gives rise to a transient pressure wave when the articulatory closure separating the different pressure is removed’ (ibid). To label [b], [d], [g] sounds as obstruents, the acoustic potential of the release phase of the stop seems to be the most significant thing. This makes perfect sense

since voiced implosives are labeled as oral stops, while sonorants are not described to have release phase in the production.

However, the vibrating state of the vocal folds during the production of the voiced implosive sounds makes it problematic to exactly classify the sounds into obstruents. As a matter of fact, obstruents are commonly voiceless, and voicing particularly characterizes sonorant sounds. For example the voiced lateral approximant [l], the voiced bilabial nasal [m], voiced alveolar approximant [ɹ], etc. are consonant sounds which involve non-turbulent airflow and vocal fold vibration during production, so that they can simply be categorized as sonorants. Meanwhile, the voiceless alveolar plosive [d], voiceless velar plosive [k], voiceless bilabial plosive [p] are without doubt classified as obstruents because they meet the both requirements ( airstream obstruction and voicelessness).

Last but not least, observing the hold phase and release phase, again, it is quite difficult to classify whether voiced implosives are obstruents or sonorants. Voiced implosives can be categorized as sonorants if we emphasize on their hold phase, but they can be obstruent if we emphasize on the release phase. Therefore, voiced implosives should not be view on their segmental unity because they have both sonorant and obstruent features (Heselwood, 1998: 77).

#### **D. Taps and Flaps**

Another challenging, and almost identical, two sounds are taps and flaps. Catford views flaps and taps as sonorant sounds because of the lack of obstruction and pressure in their production. He also distinguishes between trills and taps and flaps, and highlights that a trill is “prolongable posture”; while flaps are “a single beat”. (1977:130). Catford concludes his discussion by stating that it is erroneous to think of a trill repeated productions of a flap, or of a flap as a trill in slower motion. Ladefoged and Maddieson refer to the importance of distinguishing between flaps and taps. He also adds that, in both of them, there is a short period of closure. (1996: 230-32). In taps and flaps the active articulator, which is usually the tongue, is moving to touch the passive articulator a single touch or repeated touches. In fact, this articulation resembles that of stops, he points, except for that in the production of flaps and taps, there is not time for pressure to take place. In some way, “flaps and taps are fast motions of oral stops” (2001:150).

According to Ladefoged, flaps and taps are “momentary”. There is a quick contact and a quick depart between the active and the passive articulators, or between the two lips. For him, in flaps there is a “flicking movement, rather than a contact between the articulators. Contrary to this is Catford’s views. Catford argues that stops, trills, fricatives, approximants and resonants are “non-prolongable” while taps, flaps and semi-vowels are “prolongable”. (1994:70). Can we pronounce a tap or a flap like vowels, or do they occur as a peak of a syllable? This is the question we seek to answer.

### **E. Thrill**

Ashby states that the thrill air mechanism is like the vocal folds when vibration, there is no pressure building. However, in taps and flaps, there is a moment of closure between the two articulators. She states “For a tap, the active articulator moves rapidly towards the passive articulator and rapidly away... For a flap, the active articulator strikes the passive articulator as it passes by”. (2005: 59).

According to Ashby and Maidment three stages of oral stops production, namely approaching, holding and releasing, are not recognized in the production of trills, taps, flaps and oral implosives. In the production of all these sounds, there may be approaching without touching or touching without firm contact. Even when we have a contact, the time of this contact is very short that there is no chance for the pressure to build up and make an explosion. It is true that there is obstruction, but this obstruction needs more time to mark these sounds as obstruents. (2005: 59-60)

After having discussed the manner of articulation of different classes of sounds, obstruents and sonorants, and after relating the similarities and difference to trill, flaps, flaps and voiced implosives, it is obvious that information about the categories of these sounds is very challenging. It is the case where we have different phonations from different backgrounds and different languages analyzing the speech of different speakers from different languages. However, based on the technology and all the new soft wares available in recording, measuring and analyzing the waves of speech sounds, and based on the pronunciation practice of these sounds along with obstruents and sonorants, Flaps and taps are most likely sonorants, because there is no closure long enough to make pressure, or high enough to cause explosion. Meanwhile, trills are obstruents for two reasons. The first is that it is obvious that there is no free flow of airstream in their production (as the air is escaping between the two articulators, one beating the other, or the two against each other),

and the second reason is that kind of friction (which is somehow resembles the one in fricatives).

### **III. CONCLUSION**

After having discussed the manner of articulation of different classes of sounds, obstruents and sonorants, and after relating the similarities and difference to trill, flaps, flaps and voiced implosives, it is obvious that information about the categories of these sounds is very challenging. It is the case where we have different Phonations from different backgrounds and different languages analyzing the speech of different speakers from different languages. However, with the help of the recent technology and new softwares for recording, measuring and analyzing the waves of speech sounds, and based on the pronunciation practice of these sounds along with obstruents and sonorants, Flaps and taps are sonorants because there is no either closure which is long enough to make pressure or closure which is high enough to cause explosion. Trills are considered as obstruents for two reasons. The first is that it is obvious that there is no free flow of airstream in their production (as the air is escaping between the two articulators, one beating the other, or the two against each other), and the second reason is that kind of friction (which is somehow resembles the one in fricatives).

The underlying distinction between obstruents and sonorants lies in the vocal fold status, whether it is vibrating or not, and in the airstream flow, whether it is obstructed or unobstructed. Voiced implosives are difficult to be categorized as obstruent and sonorants because of in fact they are voiced, while obstruents are commonly voiceless. In addition, the hold and release phase makes them difficult to categorize as obstruents or sonorants. They can be treated as sonorants if we highlight their hold phase and as sonorants if we emphasize on their release phase.

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