

## **Sibaweh's Jahr (Sonority) and Hams (Whisper) In the Light of Modern Linguistic Studies**

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### **Abstract**

This research paper discusses Sibaweh's study of phonology. Sibaweh was a leading grammarian, second only to Al-Khalil ibn Ahmed Al-Farahidi. He contributed a precise, brief, but comprehensive description of sounds. Therefore, he has been an exemplary model for those who followed his steps, up until our time.

This research aims to re-evaluate Sibaweh's scholarship in the light of new findings in the field of phonology, especially applied phonology, and in its most prominent achievement, sonority (loudness) and whispering (lack of loudness or aspiration).

What Sibaweh presented with regards to his study of the place of articulation was a novel and original scientific universal idea, acknowledged by fair-minded modern linguists. His contribution, aside from its being an Arab-Islamic legacy, is a unique one in the history of linguistics, modern and old.

**Keywords :** Jahr , Hams , Tajweed , Whisper , Sibaweh , Almajhur

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Sibaweh, in his study of phonetics, in the chapter on *idgham* (i.e., assimilation) presented a definition of *Jahr* (i.e., loudness or sonority) and *Hams* (i.e., whisper) causing a problem characterized by ambiguity for the ancients and controversy among contemporaries. It is only for historical reasons that we will review some of the opinions of early scholars most of whom used Sibaweh's very words and definitions and attempted to provide explanations for them which failed to do justice to them. Hence, Sibaweh's definitions remained ambiguous, in addition to the fact that some of them confused the concept of *Jahr* for *Shaddah* (strength or stress) [1]. Some went so far as to make sonority equal to the

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 strength of *TaSwee*t (i.e. Voicing) while whisper is equal to weakness in it. As for the remainder of Sibaweh's terms in this regard, most terms were left unexplained as it was pointed out earlier.

*Almajhur* (a sonorous sound) according to Sibaweh is one "which is produced in its place without allowing airflow during articulation. This is the case of sounds produced in the throat and mouth. As for 'n' and 'm', however, they are produced in the mouth and nostrils causing *ghinna* (nasalization.) A proof of that is if you hold your nose while producing them, you will disrupt their articulation." On the other hand, *Hams* (whisper) according to him is "the sound which is produced allowing airflow during its articulation, something that is not possible with *Jahr* sounds." [2].

Orientalist scholars, interested in the study of linguistics, discussed Sibaweh's *Jahr* and *Hams* based on a concept that was well known to them, namely that *Jahr* is the voicing characterized by a vibration in the two vocal cords and that *Hams* is the lack thereof. They view Sibaweh's classification of *Jahr* as tantamount to the Western concept of voicing with the exception of three sounds which seem to undergo something else during their production. These three sounds were the glottal stop '?' (or *hamza* in Arabic) 'Qaf' (the pharyngeal 'K') and 'Ta' (the pharyngeal 'T'.) Although early scholars, including Sibaweh, had no knowledge of the vocal cords, it was possible, As Kantino argues, to guess for certain the distinction between *Jahr* and *Hams* sounds without knowing the real reason [3]. It was based on this principle that Ibrahim Anees tried to explain Sibaweh's definition of *Jahr* in the chapter on assimilation (*idgham*) in the sense that it was a result of the vibration in the two vocal cords. He maintains that "this vibration of the cords continues until the articulation is completed." He adds that "What Sibaweh did not know was that the lack of *jahr* was the absence of this vibration in the vocal cords changing a *jahr* sound into a *hams* one." He adds that: "when Sibaweh uses the word '*T'timad*' which is Arabic for 'leaning on' he means only the process of articulation, hence Sibaweh uses the expression '*T'timad*' in its point when speaking about the process of articulating a sound rather than saying '*T'timad*' in its place of articulation when it comes out. Therefore, the *point* here refers to what we express by saying the tract differentiating it from the place or the outlet of the sound." [4].

We can answer Ibrahim Anees by saying:

**First:** "Making '*T'timad*' parallel to the vibration in the vocal cords is neither correct nor supported anywhere in Sibaweh's words.

**Second:** That the lack of vibration makes a *jahr* sound a *hams* one is rather old and is now made obsolete by contemporary studies as will be shown later.

**Third:** Anees interpreted '*T'timad*' once again as the process of articulating sounds through the lungs to the air outside, which cannot be supported in Sibaweh who made '*T'timad*' in the larynx, mouth, and nostrils apart from any other organs or points of sound production.

**Fourth:** He interpreted Sibaweh's point of articulation as the tract, and this is a far-fetched interpretation because Sibaweh made a deliberate distinction between the point and the place or outlet of articulation. *Jahr* appears, according to his words, in the point of articulation (the area of its production) rather than in its outlet or tract (i.e. passage) because the outlet is smaller than the point (of articulation) which is made busy by the closure or the narrowing of the air. Furthermore, there is no point in saying that Sibaweh equated the point of articulation with the outlet in many examples because the context is the real judge in this, and the researcher have referred to all the examples in

the chapter on *idgham* (assimilation) and found it difficult to discern what is meant without relying on the context alone. Anees's argument that *jahr* takes place in the tract (i.e. the passage of air from the lungs to the outside) is therefore meaningless.

**Fifth:** He interpreted the phrase "blocking the breathing" mentioned in Sibaweh's definition of *jahr* to mean that the two vocal cords come so close to each other that they almost block breathing [5]. This is a far-fetched explanation in the sense that blocking the process of breathing does not take place on the vocal cords level in the larynx – as it appears to us – but on the point of articulation level (its place of the pronunciation apparatus) because of employing the strength of loudness which equals the leaning on this spot which constricts the airflow.

Anees concludes that contemporary research proves that Sibaweh meant by *jahr* those sounds with vibration in the cords, i.e. (Voiced) and *hams* those sounds which lack vibration, i.e. (Voiceless) [6].

On the other hand, Tammam Hassaan does not agree that Sibaweh's definition of *jahr* and *hams* matches the contemporary concept based on the function of the vocal cords because Sibaweh, he argues, did not know this function, and he did not know the composition of the larynx altogether. This is evidenced by his reference to it as the 'furthest point in the throat.' [7]. Thus, Hassaan approached Sibaweh's definition apart from this function. In sum, he argues that the source and place of 'T'timad' (pressure, as he sees it) is the diaphragm pressuring the lungs to release the air found in them. This 'T'timad' takes place on the point of articulation. *Jahr* then is a result of the strengthening of this 'T'timad', while *hams* is the weakening taking place in it. Sibaweh, as Hassaan believes, did not know the source or the manner of this 'T'timad' even though he felt it. Hence the connection between this and the diaphragm is our interpretation of the phenomenon, not Sibaweh's. [8] Hassaan's premise seems well founded and his understanding of most of Sibaweh's terms seems plausible. However, his interpretation of *jahr* as being the result of the pressure of the diaphragm was not, as we see it, well-substantiated.

It is worth taking the time to consider the term 'the sound of the chest' because even though it was not mentioned in Sibaweh's definition of *jahr* in the chapter on *Idgham*, it was the focus of attention by many researchers who viewed it as the elucidation of what was ambiguous in Sibaweh's words. Anees and Flich both quoted a text from Sirafi's explanation of Sibaweh in which he explicitly stated that Sibaweh distinguished between *jahr* and *hams* through the sound of the chest accompanying the *jahr* sounds, while disappearing with the *hams* sounds. That is so because *hams* sounds are produced from their place of articulation in the mouth. Such sounds are weak and can be silenced without losing any of their properties. As for *jahr* sounds, they are not fully articulated unless accompanied by the chest sound. [9] Anees and Flich commented on the aforementioned text as signifying that the chest sound is the vibration in the vocal cords in the throat. In summary : "The difference between *jahr* and *hams* is 'the chest sound' found in the former but absent in the latter, hence Sibaweh managed to point out clearly, with what was available to him in terms of analytical tools, what he did not know about the role of the throat, which we call *jahr*." [10] It is worth pointing out in this context that Al-Astrabathi and Ibn Ya'eesh mentioned in their explanation of *jahr* what can be understood as their knowledge of this concept of sound chest and making it the separating line between *jahr* and *hams* sounds [11].

Sibaweh did mention 'chest sound', not in the chapter on *Idgham* but further in his book when speaking about 'saturated sounds' which he divided into two kinds: the first being the sound saturated with a short weak vowel which takes place with *qalqalah* ( q t b j d) sounds because you can "stop only at the 'sawee' (voiced) due to the pressure of the sound, and some Arabs put more strength than

others. They pronounce it with a vowel following it more so than just stopping." The second is the sound saturated though the chest sound. This often accompanies the *nafkh* ( Arabic for blowing, puffing, aspiration) sounds which, though not pressed like the first, are produced with the chest sound seeping through the layers of the chest because they find a release, hence a puffing sound is heard. *Hams* sounds, however, as he says, are all produced with breathing rather than the chest sound. Furthermore, ( ء غ ع ن م ل , *l m n ein ghein* and glottal stop') are not part of either category because no sound is heard after stopping at them. Unlike the (*qaf*) and its sisters, they are not pressed, and they have no release like the one found with the *nafkh* sounds (along with *r*.) The correct assumption here is that those sounds are not saturated. [12] Ghanem Kaddouri Al-Hamad concludes from this context that saturated sounds here mean *jahr* sounds because they were saturated with the chest sound, as opposed to *hams* sounds. However, Sibaweh did not mention 'the saturated sounds' in the context of his definition of *jahr* sounds in the chapter on *Idgham*. [13] Nor did he mention the saturation of sounds except for the four *nafkh* sounds which are the ( *z*, *th*, *DH* *THuh* ) then he later added ( *r* ) to them. The *qalqalah* sounds, however, do not have the chest sound altogether. Thus, Hamad's conclusion falls short and applies only to Sibaweh's *nafkh* sounds and not to any others. Nevertheless, if we list the sounds included in the *qalqalah* ( *q t b j d* ) along with the four *nafkh* sounds (with the *r*) we find that all of these fall into the *jahr* category. The *hams* sounds pointed out by Sibaweh in this context are used to distinguish between the *nafkh* with the sounds produced with chest sound and *nafkh* with those *hams* sounds because *nafkh* with *hams* sounds is general and is produced with breathing anyway.

Whatever the case may be, the concept that the chest sound is the vibration taking place in the cords is different from defining Sibaweh's *jahr* and *hams* sounds in the chapter on *Idgham*. [14] The reason is that we cannot ignore this thorny definition and resort to some texts in which the definition of *jahr* was not intended in the way it was in the chapter on *Idgham*. This should not prevent us from thinking that a chest sound has a certain impact or echo of the movement of the cords, an impact that we feel because of its strength as an articulation produced with some effort accompanying some sounds but not others.

Based on all that mentioned above, we see the necessity of drawing a distinction between Sibaweh's definition of *jahr* as laid out in the chapter on *Idgham*, and his own words as well as other people's citations of him in other places which talk about the chest sound. Hence we find that what Tammaam Hassaan was driving at is correct, for he has focused on Sibaweh's very definition, rather than approaching it from outside. The conclusion here is that using the chest sound to try and explain Sibaweh's definition does not solve the problem which arises from its ambiguity in the first place.

Cantino sees that the definition of *jahr* and *hams* is ambiguous and debatable when it comes to its meaning. Some Western scholars chose to understand it as the "slow release" in the vocal cords, while others doubted this view because Sibaweh and Arab phoneticians had no knowledge of the exact role the vocal cords played. Hence, some interpreted *jahr* as force and *hams* as weakness or 'lightness' as Bravmann did, or they views *jahr* sounds as pressed and *hams* sounds as non-pressed, something that Cantino argued, and Flitch countered. [15] It may be acceptable to say that what is meant by *jahr* in the chapter on *Idgham* is the clarity or audibility or what can be termed the resonance, which means that *hams* sounds are those not clearly audible or what can be termed (suppressed or suffocated.) This is all based on the audibility criterion, in other words, it is related to the acoustic effect felt by the ear when hearing *jahr* as opposed to *hams* sounds.[16] Thus it is not necessary to understand *jahr* and *hams* based on the movement of the cords alone, or aside from the audibility effect manifested in the raising of the voice in *jahr* and its weakness in *hams*.

Decades ago, contemporary phoneticians have become aware of the need to show pronunciation criteria for *jahr* which do not stop at the movement in the cords. A great interest is vested in analyzing the voicing procedure through using machines, telescopes, and other equipment to monitor the movement in the throat and the entire sound passage. [17] For a long time, there was attention paid to non-throat vibrations which take place because of friction of air with the speech organs upon coming out of the mouth or nose. [18] In an attempt to explain *jahr*, Abdul-Rahman Haj Saleh (1971) made a contribution in applied phonetics in which he explained –after an experiment –the mechanism of *jahr*.

He found out that it was based on two factors:

1. The movement in glottis ( the opening between the two cords )
2. The reduction in the wall absorption.

Haj Saleh concludes that the wall of the guttural cavity covered by mucus gets flattened and stretched causing a resonance. The tension in the mucus reduces the absorption of voice capacity, thus causing resonance in the cavities. Therefore, this resonance, peculiar to *jahr* sounds, in addition to vibrations in the throat is a result of the increase in the flexibility of these walls. [19]

Gloria J. Borden and Katherine Harris )1998 ( presented a full analysis of the distinction between *jahr* and *hams* sounds based on the following:

1. Vibration in the cords
2. Breathing
3. First frequency (Hertz)
4. Duration of silence
5. Duration of the previous vowel

The reader may go back to what the two researchers have presented in terms of explanations in their book (Speech Science Primer) which includes results of many of their experiments in Haskins Labs in the United States of America. [20] The gist of their findings is that the acoustic evidence for *jahr* consonants depends more on relative time periods and timing of events than it does on frequency or difference in tension. The ability to ascertain a distinction regarding *jahr* despite the lack of vibration in the cords implies that timing is important evidence in telling *jahr* from non-*jahr* in many different ways. If we lay aside the function of the cords, we notice that if the duration of the vowel is short, it is heard as *jahr*, and vice versa. What is more important is that the supralaryngeal vocal tract is a changing source of sound, encompassing all supralaryngeal air passages, in addition to major cavities: pharyngeal, mouth, and nasal cavities when it is open. The vocal tract changes its shape and size, hence changing its resonance frequency with every sound. These resonance frequencies are called nonperiodicals as opposed to periodical resonance which takes place with equal time intervals and issues out of the larynx.

Thus, it becomes evident in the work of the two researchers, Borden and Harris that the resonance of the vocal tract, together with the vibration in the cords, along with other phonetic factors, produce *jahr* consonants. Hence, there are two sources for these sounds, one in the larynx, and the other is in the vocal tract which is always resonant. Accordingly, *jahr* sounds are a mixture of periodical resonance in the larynx and non-periodical in the vocal tract. As for non-*jahr* consonants, the cords

open wide to allow enough air coming out of the lungs causing the noise required for producing such sounds in the vocal tract. These sounds have one source, namely, the suprapharyngeal vocal tract. [21]

We conclude from what we have presented so far that Sibaweh's definition of *jahr* in the chapter on *Idgham* should stem from this development in understanding the mechanism of *jahr*, especially the aspect related to the resonance of the vocal tract, and the assertion that it is possible to produce *jahr* without the vibration in the cords. [22] As for the 'chest sound' mentioned elsewhere in his book, as pointed out earlier, it will do no harm in conceiving it as a sound issuing from the movement of cords whose resonance echoes in the larynx and the trachea seeming as though it was from the chest, according to people's perception back then.

Hence, we can interpret Sibaweh's definition of *jahr* based on Sibaweh himself. He, as we understand, with all the precision he had, felt there was a force accompanying the *jahr* sounds as a result of air stricture in the pharynx, mouth, or nose. This clearly 'audible' instance is caused by non-pharyngeal vibrations, as we understand from Abdul-Rahman Haj Saleh, Gloria Bordon, and Katherine Harris. Therefore, we do not see that Sibaweh meant in his definition any loudness coming out of the larynx or the chest. It was clear, rather, that the process takes place in the pharynx, the mouth, and the nostrils, as explicitly expressed without any need for inference or twisting phrases, as Tammaam Hassaan did, despite his reputation for precise conclusions. [23] We can refer to Sibaweh's own words in order to explain what we mean. He said, "Jahr is a sound which is produced in its place without allowing airflow during articulation. This is the case of sounds produced in the throat and mouth. As for 'n' and 'm', however, they are produced in the mouth and nostrils causing *ghinna* (nasalization). [24] His saying "produced in its place" is one of the most complicated meanings for researchers. It means leaning on the place of articulation, rather than its outlet through stricture or narrowing. As for "*Ushbi'a* (Arabic for saturated)" it means 'increased' meaning here that the leaning on the place of articulation is increased. *Hams* sounds, in contrast, witness no such increase, but the intent of leaning is there and is inescapable. *I'timad* here means the intent of articulating a sound in its place rather than in its outlet, and this is produced by stricture, the proof of which can be found in his explanation of *I'timad* in the mouth and nostrils which through stricture produce nasalization, which is a sign of force. The rest of his terms are much easier to explain. 'Blocking breathing' is to be understood on the suprapharyngeal level of the vocal tract. This stricture is different from the tension with which a sound is prevented altogether from appearing, except after an opening of the restricting organs based on the level of degrees of opening in the outlet.

Based on this, we can conclude that Sibaweh understood *jahr* apart from any suggestion of vibration in the cords. He restricted it in the pharynx, mouth, and nose, in other words in the suprapharyngeal vocal tract by way of practical articulatory observation leading to a clear and audible effect. This conclusion does not mean that Sibaweh did not feel the effect of the vibration in the cords in his observations on articulation mentioned ubiquitously in his writings. He might have considered that to be a criterion for separating *jahr* from *hams* sounds. Since things are known by their opposites, there is a definition of *hams* in *Lisan Al-Arab* (The Arab Tongue Dictionary) which almost explains the two aspects of *jahr*: the chest sound and the resonance in the vocal tract. *Hams*, according to it, is the low speech which is almost unintelligible. Hence we have the *hadith* (the Prophet's saying) " ...when he used to pray *Al'asr* prayer ( afternoon prayer) he would whisper ..." Shummar said: *Hams* in the voice and speech is that which has no echo in the chest and happens in the mouth. *Hams* and *hamees* are the feeling of the sound in the mouth without the saturation in the chest sound nor sonority in articulation. It is articulated like whispering a secret. Hence we say, people whispered, meaning they exchanged secrets. [25] Accordingly, *jahr* has two interrelated aspects: the chest sound

and the sonority in the organ of articulation. There is no doubt that Sibaweh's definition was describing to us sonority in the organ of articulation through mechanisms of articulation. If all that we have concluded so far is correct and is accepted by researchers, then we can say that it is an attempt to explain what was ambiguous in Sibaweh's words throughout successive centuries and a precedence to be accredited to his unique study of phonetics through which he revived Al-Khalil's scholarship in Arabic language and helped preserve it in this concise form for posterity.

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**ب- الدوريات Periodicals** - أنيس، إبراهيم، "جهود علماء العرب في الدراسة الصوتية"، مجلة مجمع اللغة العربية بالقاهرة، ج (15)، لعام 1962م .

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[1] See: كلام المبرّد في المقتضب، 330/1، وابن جني، سرّ الصناعة، 60/1، والزمخشري، المفصل مع شرح ابن يعيش، 128/10، والسكاكي، مفتاح العلوم، ص5، وابن الحاجب، الشافية مع شرحها للأست ارباذي، 259-257/3، وابن عصفور، الممتع، 671/2 -

672، وانظر: مكي القيسي، كتاب الرعاية، ص92، والحمد، شرح المقدمة الجزرية، ص286-292.

[2] See: الكتاب 434/4.

[3] See: كانتينو، دروس في علم أصوات العربية، ص34-35، وقارن بما ورد في الحاشية رقم (16) من هذا البحث.



- [4]: See: أنيس، الأصوات اللغوية، ص 126، 132، 125 على التوالي.
- [5]: See: Ibid, p.125.
- [6]: See: أنيس، "جهود علماء العرب في الدراسة الصوتية" مجلة مجمع اللغة العربية بالقاهرة، ج (15) لعام 1962، ص 43.
- [7]: See: تمام حسان، اللغة العربية معناها ومبناها، ص 62.
- [8]: See: Ibid, pp.60-62.
- [9]: See: أنيس، الأصوات اللغوية، ص 121-122، وفليش، العربية الفصحى، تعريب وتحقيق عبدالصبور شاهين، دار المشرق، بيروت 1983، ص 198-201.
- [10]: See: أنيس، 122، p. and فليش، 200، p.
- [11]: See: شرح الشافية للأستراباذي، 258/3-259، وشرح المفصل لابن يعيش، 129/10.
- [21]: See: الكتاب، 174/4-175. وجاء في الكتاب عن القسم الأخير أنها مشربة في طبعة هارون وبولاق .  
والسياق يدل على أنها لم تشرب شيئاً. انظر: ط. هارون، 4/175 وط. بولاق، 284/2.
- [31]: See: الحمد، شرح المقدمة الجزرية، ص 290.
- [41]: See: أنيس، أوياو الل، ويية، ص 123، وعبدالصبور شيا أن، أليز القي ارلأل فيي اوياو والنحيو العربي، ط. أولى 1987، مطبعة المدني، ص 202، وغانم الحمد، الد ارسال الصوتية عند علمال التجويد، ص 131.
- [51]: See: كانتأنو، ص 34، وقارن بفليش، د ارساة في أوال العربية (بالفرنسية)، ص 233.
- [61]: See: كانتأنو، ص 34.
- [71]: See: الموسوعة الل، ويية، تحرير كيولن، ترجمة محايي اليد ن حمأيدي وعبيدا الحمأيدان، جامعة الملي سيعود بالرياض 1421 ي، م 16/1-17.
- [81]: See: عبدالرحمن أوب، أوال الل، مكتبة الشباب بالقارة، ط. أولى 1963، ص 184-185.
- [91]: See: عبدالرحمن الحيا ايال، بحيود ود ارسال فيي عليوم اللسيان، منشيوارل المجمع الج ازياري لل، ية العربية ،  
2007، ص 27-33 من النص الفرنسي آخر الكتاب.
- [02]: See: بوردن و اري، أساسيال علم الكلام، ترجمة محايي اليد ن حمأيدي، دار الشيرع العربي، حليب، بأيرول، دل .
- [21]: See: Ibid, p. 171 and pp.330-334.
- [22]: See: Ibid, p.333.
- [32]: See for example: من ذا النحو، تمام حسان، الل، العربية معناها ومبناها، ص 61-62.
- [42]: See: انظر: الكتاب، 434/4.
- [52]: See: لسيان العيرب، دار ايدر، بأيرول (ميادة مي) 250/6-251، وقيد نببيد اليكتور غيانم قيدوري الحميد إليي يذا الموايع، انظير: شيرح المقدمة الجزرية، ص 291. ويشيار إليي أن ابين منظيور ليم يشير إليي يذا لينص فيي ميادة جهير، ميع أنيد نقيل نيص سيابويد بشيان الحيروا المجهيرة. انظير: اللسيان (ميادة جهير)،  
153-149/4.