Between Synchrony and Diachrony: The Multimodal Nature of Phonaesthemes

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Abstract

Knowledge about phonaesthesia has particularly been deepened since 1930 until now. Starting from John Wallis' first thoughts on the subject in 1653 via the contributions from John Rupert Firth's post-1930s' studies, the phenomenon has seen a growing interest as the result of the consolidated – but still to some extent arbitrary – interactions between meaning and sound over time. This paper focuses on some relevant issues in the field of diachronic linguistics, especially in connection with etymological reconstruction, to evaluate phenomena that, in a certain sense, appear to be correlated with the idea of *a posteriori* re-motivation by the speaker, investigating phonaesthemes' conceptual organization around some meaningful morpho-phonological clusters derived from Proto Indo-European, always connected with analogical associations. It also reasons about the stability of the root itself, due to fundamental characteristics of human cognition and broader social contexts in which language is used. Besides diachrony, the psycholinguistic relevance of phonaesthemic clusters is synchronically highlighted both in productivity – especially within the Germanic branch, English above all – and in comprehension processes, because their faciliatory priming effect seems to guide the speaker towards a better experience of understanding and to ease the progressive and natural addition of patterned neologisms after an existing word, in order to make them compatible with the original sets. The purpose of this contribution is to offer a general overview of the issue, trying, at the same time, to show how the phenomenon of phonaesthesia can also be read in the interaction between synchrony and diachrony, even if synchrony, for obvious reasons, remains

the privileged investigation filter.

1. Introduction

The word "phonaestheme" comes from Ancient Greek and is made up of two terms: φωνή, whose meaning is 'sound', and αἴσθημα, which indicates 'perception'. Phonaesthemes straddle the boundaries between phonology and morphology because they are proof against the sharp separation between linguistic levels within cognitive representation. Due to their distinctive feature, they are not treated as simple morphemes because they do not follow the normal criterion of compositionality (Note 1).

Phonaesthemes also seem to challenge the principle of arbitrariness in language. The hypothesis on the origin of phonaesthesia has always been dual: on one side, it is likely to believe in an analogical development within the diachronical dimension with a subsequent formation of phonaesthemic "constellations" (Note 2). On the other hand, phonaesthemes may be the result of a deep-seated correlation between sounds and ideas, but only partially motivated. Phonaesthemes may be based on imitative iconicity – referred to as 'auditory' or 'articulatory' iconicity (Fischer, 1999) or 'primary' iconicity (Peirce, 1955) – or cannot be related to any imitation of sound (in such a case, Fischer talks about 'associative' iconicity, while Peirce defines it as 'diagrammatical').

In fact, they deeply differ from other forms of sound-symbolic attribution of meaning – that are usually motivated in an imitative way – and they tend not to have a reproductive aim in terms of iconism. Several studies aim to demonstrate the existence of non-arbitrary sound-meaning relations; one of them is the cross-linguistic study carried out by Mompean et al. (2020). They suggested that both iconicity and systematicity motivate phonaesthemic associations. Various authors hypothesised a possible iconic origin of phonaesthemes; for a clearer vision, please refer to Abelin, 2012; Bolinger, 1950; Bottineau, 2008; Rhodes, 1994. On the other hand, we also dispose of explanations that consider phonaesthemes rather as a matter of statistical clustering, in order to justify the attraction of other lexical items and ease the creation of new related words. From this point of view, phonaesthemic associations might be conventional and, therefore, learned. To deepen the topic, refer to Bergen, 2004 (cf. also *infra*); Diffloth, 1994; Fordyce, 1988; Hunter-Smith, 2007; Markel & Hamp, 1960-61; Hinton et al., 1994; Zingler, 2017. A compromise between the iconic and systematic perspectives is provided by Kwon, 2016 and Magnus, 2000; in this case, there might be a natural tendency to associate certain sound clusters with meanings based on innate or imitative grounds but learning and conventionality could also determine phonaesthemic networks (Mompean et al., 2020, p. 518).

2. A Brief History of Phonaesthesia

2.1 John Wallis

After four centuries, the *Grammatica linguae Anglicanae* (1653) still is of interest to scholars and academics all over the world and represents a milestone in the field of English language

study, particularly from a grammatical and a phonetical point of view. Its author, mathematician John Wallis (1616-1703), was the first to notice, through an empiric methodology, that English language was different from Latin – to which every European vernacular was traced back by the scholars before the advent of Indo-European studies and their comparative implications. The treatise – whose merits (Note 3) don't stop at analyzing the evolution of articulatory phonetics and providing lifeblood to the American version of Structuralism – referred to phonaesthesia as the accidental and fortuitous association of sounds and meanings and intended it as a simple reference, among words, to the same semantic area. His work is based on an important distinction: according to Wallis, phonaesthemes don't have an *a-priori* meaning because it is the presence itself of similar sound structures among English words with similar meaning that might give the sounds sense. In fact, "phonaesthemes are a very specific type of relationship that neither imply nor necessitate that any phonetic structure is intrinsically meaningful. There is no natural or inherent correlation between the sound and the meaning of any phonaesthemes; the prosodies of phonaesthemes only acquire their meaning associations as the result of patterns in the vocabulary of a language" (Willett, 2015, pp. 9-10). In Wallis' opinion, conventionality played a central role in this morphological event, because the cluster expansion appeared to go hand in hand with the pull strength exerted by it, according to the speaker's feeling; for example, some onsets reminded the speaker of specific ideas, as in the case of /stɹ/ for 'strength', of /st/ linked to 'firmness', of /wr/ indicating 'torsion', of /br/ suggesting the 'breaking act', of /shr/ meaning 'contraction', of /sm/ for 'smoothness', of /cl/ with an idea of 'adherence', of /sp/ for 'expansion', and /sk/ for 'violent compression'. It is important to underline that this idea of recalling a certain semantic area because of a recurrent association between meanings and phonaesthemic sequences brings forward Saussure's linguistic arbitrariness by three centuries, since meaning is not seen as inherent to the word, but as associated with it by the community.

2.2 John Rupert Firth

John Rupert Firth was the first scholar to shed a significant amount of light in his writing on the phenomenon at issue, which consist of four main publications: the first, *Speech*, published in 1930 and addressed to a non-academic audience; *The Tongues of Men* (1937), an informative history of language and language sciences; *Papers in Linguistics (1934-1951)*, released in 1957 as a compilation of Firth's articles up to 1951 and, eventually, a posthumous (1968) gathering of later essays and works collected by F. R. Palmer under the title *Selected Papers of J.R. Firth (1952-1959)*.

In 1930, at the very beginning of a new wave of interest, 'phonaesthesia' is coined as a term and defined by the English linguist (Note 4) (1890-1960) as a 'phonetic habit'; it means that phonaesthemes are considered to be "a kind of phonological behaviours or patterns learned or identified by a particular linguistic community by way of frequent exposure" (Firth, 1930, p. 180). Firth showed his considerations by referring to some prosodies co-occurring in particular contexts of experience: in this way, the community is led to acknowledge these traits in association with the implied meaning. Phonaesthemes are depositary of the so-called "cumulative suggestive value", an amount of significance that turns out to be intelligible only to the members of the reference speaking community ("it just so happens that we hear and learn

to make [such] sounds at present in [particular] contexts", Firth, 1930, pp. 184-185). The example to which Firth appeals is the onset cluster /sl/, which in English comes with an idea of pejoration. The habit itself of recurring with a particular meaning within a specific speaker's community is described as the feature of belonging to "a much bigger group of habits...the *sl* phonaesthemes" (Firth, 1930, p. 184). According to Firth, the most prevalent type of phonaesthemes in the English language consisted of the thirteen onset ones, among other final clusters formed mainly by simple consonants. Firth hypothesised the existence of thirteen onset phonaesthemes over the course of two main publications (1930; 1935); he described in detail almost all the meanings with which an onset occurred and provided a list of words throughout in which he claimed the onsets showed themselves as intended. The thirteen onset clusters identified by Firth were as follows: /sl/ with an idea of 'pejoration' (as in *slack, slouch, slush, sludge, slime*; 1930, pp. 184-185); /sm/, with the same subtext, (as in *smut, smudge, smatter, smash*; 1930, p. 185; 1935, p. 44); /sn/, still in a pejorative sense (as in *sneak, snatch, snag, snub*; 1930, p. 185; 1935, p. 39); /sw/ meaning 'fast' or 'strong' but predominantly in a downward movement (as in *swill, swish, swipe, sweep*; 1930, p. 186); /stɹ/ with an idea of 'straightness' and/or 'stretching movement' (as in *straight, stress, strains, strength, stretched, stripe*; 1930, p. 185; 1935, p. 44); /st/ meaning 'strength', in a metaphorical way too (as in *stand, stiff, staff, steep*; 1930, p. 187; 1935, p. 44); /dɹ/ meaning 'hanging' or 'falling downwards' (as in *drip, drop, droop*; 1930, p. 187); /kl/ with an idea of 'clumsiness' or 'stupidity', but also of 'thickness' (as in *clay, clod, clog, clump, clamp*; 1935, p. 44); /gɹ/ meaning 'gripping' (as in *grip, grasp, grab, grope*; 1935, p. 44); /kɹ/ with the idea of 'crookedness' (as in *crank, cross, crick, crab, crazy*; 1935, p. 44); /skw/ meaning 'weakness' in every possible extent, also crossing over the cuteness area – maybe implying that someone is cute when he doesn't intimidate others, therefore resembling weak (this cluster is likely to be found in words such as *squander, squirm, squelch, squib*; 1935, p. 44); and /tw/ with an idea of 'smallness' (as in *twitch, twist, twine, twinkle, twiddle*; 1930, p. 186). Firth also spotted a /fl/ cluster (in words such as *flick, flake, fluke*; 1935, p. 39), but its meaning appears to be unclear even to him and cannot be inferred from the lexemes in which it is contained.

2.3 Other Studies

Another study about phonaesthemes as a semantic deposit – in this case as a combination of multiple meanings – is provided by Edgar H. Sturtevant, who in 1947 recognised the pejoration pattern adapted to the /sl/ sound – as previously stated by Firth – and talked about bi-phonaesthemes. He also posited another English onset phonaestheme, /b/, whose semantic association linked it with an idea of explosive action (as in *bash, biff, bang*); his contribution is also important because it provided the /fl/ cluster with the meaning it lacked, by creating a bond with the fast movement, mostly of light (*flicker, flitter, flash, flare, flame*).

In 1966, Hans Marchand offered a rich inventory of both onset and rime phonaesthemes (respectively opening and closing the word that contains them); however, his quantification gives no idea about the incidence of the phenomenon. Within his vast inventory, Marchand, besides reflecting on the phonaesthemic pattern, posited some different meaning associations for six of the original onset clusters, for example such as /stɹ/ – according to him, related to 'stepping and striding', rather than the idea of 'straightness' – or /sl/, linked to 'falling and

sliding movements' more than to 'pejoration'. In general, these differences can be justified by the concept of bi-phonaesthemes, which refers to the idea that one specific onset prosody could recur expressing a variety of different meanings. It is called "multiple semantic recurrence" and the reverse of this linguistic phenomenon is "multiple phonetic recurrence", namely the expression of a particular meaning related to more than just an onset prosody. According to Willett (2015, p. 217), "if an onset prosody recurred with many different meanings in a language, it might be less prone to acquiring a [connotative] association with any one of these than if it recurred with relatively few meanings. Similarly, if a given meaning recurred with many different onset prosodies, it might be less prone to acquiring a [connotative] association with any one of these than if it recurred with relatively few onset prosodies".

Some progress in this field of morphological studies was reached in 1995 with Bowles' analysis, carried out on the *Longman Active Study Dictionary of English*; it encompassed twenty-two onset and fifty-two rime clusters and had statistical purposes. The implied hypothesis was, again, the multiple semantic occurrence one. In fact, Bowles retrieved the bi-phonaestheme's (1995, pp. 103-104) concept talking about the onset /kl/: he observed that 'loud sound' (i.e., *clap*) was one of the recurrent meanings besides 'nasal/facial gesture' (*to clench* a jaw, for example) or 'closing movement' (as in *clam*).

In 2002, Crystal analysed in detail the /sl/ pejorative cluster, observing that in forty-one cases out of sixty-eight, the onset phonaestheme comes with a worsening meaning, versus the remaining twenty-seven that carry none. Crystal faced the argument as a part of a larger examination whose objects were verbal art and language play (2002, pp. 124-126). The used method is similar to Bowles' one (1995), but it suffered from several omissions about the methodologies of his study. Besides supplying no clues on the comprehensiveness of the list of /sl/ lexemes – and, therefore, about its representativeness – the scholar also didn't provide any information about the adopted criteria in interpretation and the level of complexity of the sampled dictionary. In conclusion, although the findings confirmed Bowles' position, the lack of details prevents replication of the investigation in order to further validate the results.

Recently, Reay (2006, pp. 893-901) has identified the existence – and, consequently, the productivity – of six onset clusters and five rime phonaesthemes in English. Reay's English onset phonaesthemes are the following: /sk/, which has the double meaning of 'person who shirks work or duty', as in *scab* or *skiver*, and 'light movement', as in *scamper*; /sl/, reminiscent of a 'sliding movement' (*slither*, *slide*, *slip*); /d/, linked to the idea of 'dullness, stupidity' (for example in *dopey* or *daft*); /sw/, with an idea of movement through air or water (as in *swing* or *sweep*); /kl/, referred to 'clinging action' (i.e., *cling* or *clasp*). He summarised them all into a schematic like the one used by Sturtevant in 1947.

At the end of this overview, it is surely worth adding two significant contributions to the investigation of phonaesthesia. The first is a lexical analysis carried out by Sadowski in 2001, of Old and Modern English, that posited the /gl/ phonaestheme presence as linked to the 'light' meaning in forty percent of cases. On the other hand, a survey by Williams (2014) retraced the utilization of the /gl/ cluster throughout the Middle English dictionary and the Christian poem *Pearl*. The /gl/ phonaestheme is a typical example of phonaesthesia in English – as well as the

first historical example of this phenomenon since it was used by Plato (cf. *infra*, § 4.2) approximately 2400 years ago to create a link between the sound and the idea of 'glutinous' in the ancient Greek language – because it forms a large group of words that share this onset cluster besides the meaning of 'reflected light' (Note 5). Before Williams, the issues of the presence of this phonaestheme and of its correlation with light had been previously raised by Sadowski in 1999.

2.4 More Recent Contributions

On top of the body of descriptive works – in which phonaesthemes were treated almost as a linguistic universal in the sense that every reviewed language appears to possess them (Note 6) in some way – several studies have been added to provide a psycholinguistic point of view, combined with a cross-linguistic perspective.

A crucial part is played by phonological neighborhood density, which is a facilitator of lexical access (Luce & Pisoni, 1998). The psychological side of phonaesthesia sinks its roots into the experiment carried out by the German psychologist Wolfgang Köhler in 1929; it confirmed the presence of embedded expectations within the human mind and the evocation of their outcrops emerging on the surface when acoustic image and visual representation meet. The experiment asked for two shapes with the invented denominations *maluma* and *takete* to be put in relation to each other. It turned out that the statistical sample's entirety correlated the last name with the spiky shape while the first definition was systematically associated with the round figure. This test has been repeated in two different modalities: the first one, at the University of Belgrade, through the administration of abstract visual models' sets besides a series of non-words. Afterwards, McMaster University in Canada consulted a group of children aged two-and-a-half, asking them to pair the words *bouba* and *kiki* to similar terms among the ones used in the other cases. The result was also analogous in pre-school age (Ramachandran & Hubbard, 2001, pp. 3-34).

In 1999, Abelin investigated the problem of phonaesthemes' psycholinguistic perception through an analysis of the productivity of some clusters in six speakers having different linguistic backgrounds (English, Arabic, Dutch, German, Ibo, and Spanish). Then, Magnus (2000) dealt with the idea of 'straightness' linked to the /stɹ/ phonaesthemes both in English and Irish Gaelic. In 2007, with his study, Mobbs aimed to highlight phonaesthemes' semantic dimension by pointing out the semantic drift of words with appropriate phonetic form towards their semantic core. Another step towards a further deepening of cross-linguistic studies was made by Francesconi, who in 2011 investigated the /gr/ cluster in English (i.e., *to growl*), Spanish, and Italian (*gruñir* and *grugnire*, again 'to growl'): in fact, it appeared to convey in all three languages the meaning of 'guttural, threatening, or complaining voice', creating a link between the Germanic and Latin branches of Indo-European. Later in 2015, Willett analysed ten possible phonaesthemes related to the meaning of 'strength', 'stoicism' or 'crookedness' in English, French, and Polish.

One of the last contributions in this regard is the study carried out by Mompean et al. (2020, cf. also *infra*): it pursued the issue of the possible existence of cross-linguistic phonaesthemes, especially in English, French, Spanish, and Macedonian languages. Although they are all

Indo-European, these languages pertain to different stocks and/or subfamilies; moreover, it is interesting to note that, while English displays a rich literature about phonaesthesia, the remaining languages are less researched except for a few words usually mentioned as examples. The underlying experiment intended to answer two questions: are speakers with different linguistic backgrounds sensitive to the presence of /fl/ and /tr/ clusters in non-words? If so, why? What is the source of these semantic associations? These questions – and, subsequently, the cited study and its conclusions – paved the way to comprehend phonaesthemes in more coherent and explanatory models, despite the difficulties involved. For example, Willemsen & Miltersen (2020) tried to analyse the phonaesthemic contrast /l/~/r/, whose presence within words was interpreted in a paradigmatic opposition, in a way similar to what usually happens with morphemes. Moreover, Robbe & Willemsen (2022) examined some phonaesthemic alternations pertaining to Flemish dialects of Dutch that appear to be put in place in order to create marked variants of a neutral base word.

Meanwhile, the role of phonaesthemes in morphological and cognitive blends has been deepened by Smith (2014), who has studied multidirectional motivation ties in diachronic semantic shift in historical blends.

3. The Obscure Morphological Nature of Submorphemes

3.1 The Phonaesthemic String

As is well known (see Bergen, 2004, p. 292; Thornton, 2014, p. 64), one of the main problems connected with the definition of "submorpheme" is related to the fact that, once the consonant string carrying the phonaesthemic meaning has been eliminated, what remains is never a recognizable and segmentable morph with an identifiable meaning, and which, in combination with the phonaesthemic string, contributes to providing the global meaning of the expression. If /gl/ in *glare*, for example, is supposed to mean 'light', what does the remaining /are/ mean? Phonaesthemes cannot stand on their own, exactly like "cranberry-morphs", so their morphological nature is questionable. According to Dressler (1990, p. 38), "a submorpheme is a sign (X) on a larger sign (Y) where (Y minus X) is not a sign […] usually submorphemes are tertiary signs insofar they are parts of morphemes, but not of words".

When we think about submorphemic elements we should consider the fact that they are meaningful parts of morphemes which, differently from sound-iconic phonemes (such as the vowel /i/ for connoting smallness and speed, as in Sp. *-ino, -ico, -illo, -ito*), are sound-symbolic (i.e., conventional) clusters with language-specific meanings (cf. Dressler, 1990, p. 35). Submorphemes are rather unnatural, according to the universal naturalness parameters, due to their lack of proper morphosemantic and morphotactic parsability (cf. Dressler, 1990, p. 38), and that's the reason why they are relatively rare. In general, as observed by Bergen (2004, p. 290), phonaesthemes seem to appear in content words over function words, and in more specific (or subordinate level) rather than more general (or basic level) words.

In onomatopoeic expression, in fact, we perceive a likeness between the sounds created by the content and the linguistic expression, differently from the indexical motivated ones (among which Carlin & Johansson, 2014, quote phonaesthemes, even if they are aware that boundaries

are to some extent floating). See Dingemanse et al. (2015) for the difference between the two types of non-arbitrary motivation in language, i.e., iconicity (based on perceptual similarities between sound and meaning) and systematicity (based on statistical regularities linking sound patterns to specific meanings). According to Mompean et al., (2020), both iconicity and systematicity motivate the use of phonaesthemes in various languages.

The acquisition of the status of phonemes does not deprive them of their quality of sounds, which, in this specific case, retain a proximity to natural sounds and therefore operate as natural signs of the events themselves (cf. Nobile & Lombardi Vallauri, 2016, p. 9 and 78 ff. for a discussion on the quasi-morphological status of phonaesthemes).

On the other hand, as already seen, the phenomenon of phonaesthesia occurs every time when a particular phonological sequence occurring in etymologically unrelated words is associated with common meaning, often characterised by expressive properties. In this sense, the etymological connection plays an important role in identifying phonaesthemes or, differently, etymological clusters, often positioned in the onset of the PIE root, which all the historical linguistic outcomes have (even if it is sometimes blurred due to phonetic changes).

According to Chudak (2015, p. 59), who analysed English, Polish, and Irish phonaesthemes beginning with *s-* (in order to discuss the expressive properties of initial *s-* sequences in Irish), the reasons that facilitated the development of a non-etymological initial *s-* consist of its acoustic perceptibility, its historic capability to 'wander' (cf. Southern, 1999) and its semantic transparency (in the specific cases discussed it is shown to be a segment commonly used in pejorative context). Given that initial *s-* could appear or not in derivatives, "its presence or absence did not impinge on the meaning of a given root enabled *s-* prefixation to be used for purely expressive purposes" (Chudak, p. 60). By *s*-mobile is notoriously intended that phenomenon whereby some Indo-European roots appear in certain cases with an initial *s-*. Since it does not seem possible to identify a different meaning for the forms with *s-* compared to those without *s-*, it is not legitimate to speak of prefix or preverb. Indeed, this element appears to sometimes have only a reinforcing-expressive value (e.g., German. *lecken* 'lick' ~ *schlecken* 'lick, nibble'), while much more frequently it seems semantically completely inert (e.g., Gr. τέγος ~ στέγος 'roof'). Sometimes it appears in historical derivatives, such as in English *scab* from **(s)kep-* 'cut, scrape', which also gives rise to Latin *capulare*.

Phonaesthemes, which seem to straddle the boundaries between phonology and morphology (Mompean et al. 2020, p. 517), conceal a psychological value which, once traced, is no longer negligible (cf. Bergen, 2004): the compositional model of items and arrangements is not adequate to highlight the analogy between morphological and phonaesthemic priming, contrary to statistical theories centered on the principle of frequency of use. Using the exact words of Benjamin Bergen (2004, p. 307): "phonaesthemes are a testament to the diligence of the human ability to encode and use subtle statistical associations in the linguistic environment".

4. Phonaesthesia and Etymology: The Diachronic Connection

4.1 The "Etymological Perception" of the Ancients

The origin of phonaesthemes, as we have seen, remains obscure and enigmatic. According to Boussidan et al. (2009, p. 40), who studied the historical outcomes of PIE *ghel-/*ĝhel-, *ĝhley- etc. 'to shine' (which is usually studied in connection with the phonaestheme gl-), it is possible that, at least in some cases, "historical information influences the distribution of word meaning in non-trivial ways. One reason for this could be that lexical items are linked to conceptual networks that are rooted in history". Phonaesthemes, therefore may have originated as morphemes in a proto-language, and "may have survived through generations".

A very interesting perspective, and which in our opinion can be connected with the process underlying phonaesthesia, is proposed (albeit with other purposes) by two historical linguists, Sani (2001) and Ronzitti (2001), who, in two etymological works, demonstrate that the texts of antiquity can manifest the perception by the ancients of etymological links that linguists had not thought of. Sani (2001, p. 67), for example, argues that sometimes in ancient texts, we find etymological explanations made by the Ancients, which are not necessarily acceptable from the phonetic point of view of the specific language, nor from the level of comparison. According to the ancient Indians, there was an eternal and unique relationship that linked the word to reality. Words would be characterised by connatural connections with the extra-linguistic world that they denote, so that equal sounds can only refer to equal meanings. It is the same ancients, in the ancient texts, who sometimes suggest the etymologies: as underlined by Sani (2001), they do not want to find the truth around words (like modern etymologists), but, through words, to find the truth around objects or phenomena. In the specific case analysed by the scholar, it would be possible to imagine an etymological connection between the Sanskrit word for 'cloud', i.e., *nabhas*, and the root of the verb 'to split, to break', *nabh-*, on the basis of a reasoning based on a process of cultural reconstruction: according to the Vedic culture, the waters were initially enclosed in the belly of a mountain and were freed thanks to the god Indra (= act of 'splitting'),often depicted breaking the rock that contains the waters.

This brief introduction opens the door to a better understanding of what Ronzitti (2001) hypothesised about a Latin lexical series connected with the concept of 'noise' and 'dissection', in which we observe the presence of the same initial root syllable, *ru-*. Virgil (whose works are analysed for this purpose by the author) probably had a strong perception and awareness of the etymological connection between words such as *rumor* 'noise', *rumpo* 'to break' (historically connected with *rupes* 'rock, cliff') and *ruo* 'to move in rapid motion', 'to break, collapse' (etymologically connected with *ruina* 'ruin'), unlike what the main etymological dictionaries do, separating the two roots (*rumor < *rĕw-, rēw-, rū/ŭ-*, onomatopoeic basis meaning 'to bark, roar, bellow, making hoarse noises'; 'to hum, grumble'; *rumpo, rupes < *rewp-* 'tear, break and *rupeys-* 'rock, cliff', enlargements from *rew-, rewə-, rū/ŭ-* 'tear, dig, arouse').

In Virgil therefore, according to Ronzitti's analysis, the noise really 'breaks' and is caused by the rupture, the cliff is so-called because it really 'resounds': this poetic technique reveals a manifestation of an etymological connection and the textual etymology does not require a

genetic relationship, even if it sometimes makes it re-emerge. In cases like those mentioned, the syllable *ru-/-ur* or *-or* (cf. *rutilare* 'to shine', *coruscus* 'trembling, vibrating, dazzling', *clangor* 'clangor, deafening noise that violently shakes the air', *ruo* 'precipitate' etc.) would allude both to the visual and acoustic codes, and also to the idea of hasty movement and dark noise. Ronzitti (2001) imagines just one polisemic PIE root such as **rew-* 'to make noise, to break', precisely on the basis of the common strongly allusive and mimetic phonic sequence, but, above all, on the basis of what would emerge from Virgilian poetry itself.

In a certain sense, we are dealing with a submorphological common denominator shared by a list of lexical units belonging to the same semantic field (Boussidan et al., 2009, p. 20). From a point of view that takes into account the analogical properties of phonaesthemes, therefore, it would also be possible to imagine that a formal nucleus prototypically associated with a given sensorial sphere could, in the etymological perception of the speaker, "attract" another, which, in the consciousness of the speakers, was formally and semantically (as well as culturally, as we have seen) connected, to the point of creating phonaesthemic connections on the basis of etymological combinations that were only perceived.

Moreover, as far as the difference between onomatopoeia and phonaesthemes is concerned, Thompson (2017) observes that one aspect is the true iconic sequence with imitative functions (onomatopoeia, for example), another is the phonaestheme, which marks only semantic classes for historical reasons. In his opinion, phonaesthemes are a systematic submorphemic phenomenon rooted in diachronic arbitrariness, rather than iconic means of encoding meanings.

So, if we think about the relationship between synchrony and diachrony, we immediately realise that these two levels of analysis, applied to the study of phonaesthesia, obviously represent very different filters. As indicated by Carling & Johansson (2014), when working within a diachrony perspective, uncertainty increases and the reasoning becomes decidedly more complicated, because the etymological issues come into play, with all the obscurities of the case, especially linked to the change in the form and function of the linguistic sign over time and its gradual 'opacification' (cf. also *supra*, Thompson 2017, according to whom, from historical and phonosemantic points of view it is unclear why phonaesthemes should be considered iconic). The change from a transparent word (modular sign) to an opaque word (fixed sign) was mainly due to the blurring of intra-word morpheme boundaries (see Belardi, 1985a, 1990, 1993), especially those between the root and word-formation suffixes, which became fused and triggered the autonomous storage of a very large number of formerly derived items between PIE and historical languages.

Some scholars have studied some etymologies according to phonaesthemic claims: recently, Pentangelo (2021) has discussed the obscure origins of Engl. *bone* and *blood*, which lack clear cognates in other Indo-European languages, imagining they were formed by blending the initial /b/ phoanestheme (cf. §2.3) with two preexisting lexemes: PGmc. **flōda-* 'something that flows' and **staina-* 'stone.'

4.2 Articulatory Mimesis in Cratylus

As is well known, the Platonic dialogue *Cratylus* (ca. 427-347 BC), milestone of the first reflections on language and on the relationship between words and things, is also known for the passage (426c-427d) in which Plato speaks of the use of letters by the *nomothétes*, who first gave birth to the "original" names. As Belardi recalls (1972, p. 26), this is the first intuition of phonosymbolism, i.e., the possibility of entrusting the sound produced by the pronunciation of letters with the function of "evoking" things directly, on a sensorial level, without the intervention of the lexical function of the word. The most interesting aspect, captured with the usual brilliance by Belardi (1972, pp. 41 ff. and 1985b, pp. 33 ff.), however, lies in the fact that Plato does not deal so much with the acoustic-auditory aspect but detects a mimetic parallelism between reality and the motor or plastic aspect of the pneumophonoarticulatory apparatus (which is a process different from onomatopoeia): in *Cratylus*, therefore, any hint or reflection regarding phonaesthesia referring to the acoustic-auditory field of language would be non-existent, but, if anything, only the description of an articulatory "kinesthesia" should have existed, within an elementary "psycholinguistic" framework. For example, when Plato deals with the Greek letter *rho*, he identifies its mimetic capacity connected to movement (scroll, tremble, bump, break, cut, turn), roughness (harshness), paying attention to the attitudes and movements of the tongue and lips, and not to the evocation of external reality.

What is important, however, is that a universal psychological conditioning would seem to preside over this process of equation of certain schemes of the phonatory apparatus with certain geometric schemes of extra-linguistic reality, so much so that the labial articulations would be psychologically associated with the idea of roundness and, on the contrary, non-labial articulations would be associated with the idea of sharpness and subtlety (Belardi, 1972, p. 42 and 1985b).

Therefore, apparently, it might seem that Plato, when thinking about letters, has in mind what for us is phonosymbolism, when instead his clear awareness of the functionality of language and of the relationship between the forms of articulation and the essences of things emerges.

An interesting and in-depth reflection in this regard is that of Bertinetto & Loporcaro (1994), who, in recalling the articulatory foundation of Platonic phonoiconism (cf. *supra*), based on the comparison between extra-linguistic reality and kinesthesia of phonation, is an even more interesting and decisive aspect: this comparison is of a metalinguistic nature, and not necessarily primary and pressing to articulate language (ivi, p. 159). All the rest is a result of interpretation, to the point that "from the point of view of empirical verifiability, the assertion that for example [t] could be used as a significant element as it is directly imitative of both 'abrupt movement' and 'rest, fixity, resistance' is equivalent to saying that it was used in an arbitrary way" (ivi, p. 160) (Note 7).

4.3 Phonaesthemes and PIE Etymology

The studies that have dealt with the specific phenomenon of phonaesthesia are, as we have seen, mainly synchronic, because they work mainly on the very definition of these types of submorphemes, as well as mainly on their classification. For this reason, sometimes the

observations that can certainly be accepted from a strictly synchronic point of view are difficult to apply to the prehistory of language, i.e. to the linguistic reconstruction phase (cf. the PIE root *ghel-/*ĝhel-, *ĝhley- etc. 'to shine', which have notoriously been connected – see § 4.1 – with words beginning with a clear phonaesthemic string such as Engl. *glitter, gleam* etc., but also more opaque words such as Eng. *yellow* <*ghel-wo-*, cf. Watkins, 2000, p. 29, Avestan *zari-* 'yellow, golden', Sanskrit *hari-* 'gold, blonde' etc. For the German words with initial *gl-*, however, no preforms are given, they seem to be later creations – and that's the reason why they could be interpreted as real phonaesthemes.

Bottineau (2008, p. 29), for example, speaks about different "visions" cohabiting in the present-day language which are the results of diverging pragmatic comments over the same objects and activities. This is certainly not the place to go into the intricate and complex problem of the etymology of verbs connected with the act of writing and with the consequent and fundamental anthropological question of the phenomenon (for which we refer above all to Cardona, 1981, Mancini, 2012, Mancini & Turchetta, 2014).

For instance, in English we have 'to write', which, according to Bottineau's opinion (ibidem), "refers to an activity which is characterised by *wr-* as a specific movement, the experience of torsion (cf. *wring, wrist, wrestle, writhe, wriggle, wrath, wrought, wrap, wreck, wretch, wry…*)". The corresponding German word is *reißen* 'to tear, drag; sketch,' from Middle High German *rīzen,* Old High German *rīzan* (earlier **wrīzan*, 'to tear, tear in pieces, scratch, write'), Anglo-Saxon *wrītan* (cf. Mancini, 2017) etc., so that the various meanings of the cognate languages are explained by the manner in which runes were written or scratched on beech twigs (cf. Kluge, 1891, s.v. *reißen*). This root however is not found outside the German sector, and, also within it, appears, as seen, both with and without initial *w-*. In Latin we have *scribere* (< **skerībh-* 'to cut') and then, in the Romance languages, all its derived forms (*écrire* in French, *escribir* in Spanish etc.), but also *schreiben* in German ("a genuine Teutonic verbal root, *skrīb,* 'to inflict a punishment,' which was transferred by Christianity to ecclesiastical affairs", cf. Kluge s.v. *schreiben*), in Greek *gráphō* 'to write', in Old English *ceorfan* 'to cut', from PIE *g(h)rebh-* 'to carve' etc.

Different and competing pragmatic outlooks have shed diverging submorphemic lights on the same notions, states Bottineau (2008, p. 27), who underlines that "*wr-* is reserved for ordinary experience in daily life (write) while *scr-* is reserved for abstract applications and technological jargon" (but cf. Mancini, 2017 [2019], p. 162, who recalls that in pre-Carolingian and Carolingian Latin, the verb *scribere* is used only in the generic sense of 'to write', without any reference to the material methods of writing).

This is certainly correct as well as interesting, but, if we look at the matter from a perspective that takes into account the origin of the individual words, we simply have to note that, precisely because different roots gave rise to different historical forms that now carry the common and more generic (compared to the original) concept of 'writing', the "creation" of the single lexeme necessarily had to be affected by the material or the technique used. As stated by Buck (1949, p. 1283), for example, the majority of the words for 'write' meant originally 'scratch, cut, carve', applicable to writing on stone, wood, or wax tablet (Lat.

scribere etc.), while other historical verbs such as Goth. *mēljan* (cf. German *malen* etc.), Old Persian *ni-pištā-* (adj.) 'written down', Tocharian A *pik-* 'write, paint' etc. belong to the groups including verbs for 'paint', so that "one is tempted to assume the development 'color, paint' > 'write' as appropriate to writing on papyrus or parchment" (*ibidem*).

Finally, we must not forget, as is well known, that the consonant "skeleton" of the Indo-European root (exactly as in the case of phonaesthemic clusters) was the one that conveyed the semantics of the root, contextualised in the *hic et nunc* thanks to apophony and various affixes, and that the IE languages underwent a progressive blurring of the morpheme boundaries between the root and word-formation affixes (Belardi, 1985a, 1990, 1993). The same doubling in the so-called intensive present and perfects of Homeric Greek and Sanskrit, for example (cf. Di Giovine, 1990, I, pp. 81 ff. and 2010), if read according to the phonaesthemic framework, can be perfectly interpreted as a mimetic spy of an iterative-intensive nuance: it is no coincidence in fact that this type of process was grafted onto roots of an expressive nature (regardless of the structural typology of the root and of its initial consonant cluster), indicating noises, inarticulate expressions of animals etc.

As we have seen, it is important to remember that, in the case of phonaesthesia, we are not in the presence of a meaning inherent in the phonaesthemic link, but that we are dealing with simple phonic sequences that do not convey any intrinsic semantic value. Furthermore, as mentioned several times, it is also possible that the phonaesthemes emerged, at least initially, as a "historical accident" and that their number then grew, following a "snowballing effect" (cf. Blust, 2003, p. 199). Moreover, as Belardi taught us in many of his writings (among all, cf. Belardi, 1985a), the lexical sign, over time, before its "final stabilization", undergoes various and profound phonetic alterations, which lead to fixity of the lexical sign and to the polymorphy of the radical part. Therefore, if the phonaestemic string in the onset of the root is in turn the result of a series of diachronic changes, it is difficult to evaluate it if not in synchrony, because the comparison is performed between phonemes functioning in the context of higher modules (monemes) and that, going back in time, the form of the original word is often very different from that of the corresponding documented one, which has undergone a strong diachronic alteration.

Furthermore, as is well known, the only exceptions to the regular linguistic changes (e.g., the so-called "phonetic laws") are exemplified by onomatopoeias, which in fact represent phonological units capable of meaning in themselves, since they perform a symbolic function, a function that would not seem be typical of phonaesthemes, rather connected to analogical associations.

5. Final Considerations

As discussed by Bertinetto & Loporcaro (1994, 158 ff.), certain phonaesthemic associations are certainly characterised by psychological relevance, as various studies have shown, but this does not necessarily mean admitting an unconventional relationship between sound and sense, because "the both iconic and mimetic relationships have in fact always and in any case a secondary and subjective character, that is, they are derived from the presence in the lexicon of some words that act as prototypical driving elements in the same associations" (Note 8).

The study by Monaghan et al. (2014) shows that words of similar meanings appear to be phonologically more similar than words of different meanings. The research, conducted on a statistical basis with sophisticated analysis tools, demonstrates that in the English lexicon there is a great and widespread use of both imitative processes and preferential associations (cf. also Nobile & Lombardi Vallauri, 2016, pp. 78 ff.), to the point that the observed correlations would not seem to be due to chance and that "systematicity is more pronounced in early language acquisition than in later vocabulary development" (Monaghan et al., 2014, p. 6).

It should therefore be emphasised that if, on the one hand, it is certainly true (cf. Boussidan et al., 2009, p. 37, Sagi, 2019) that the connection between phonaesthemes and word meanings can be due both to semantic similarity and to historical connections (i.e., derivation from the same PIE root), it is also quite obvious that "phonaesthemic sets have a higher cohesiveness within historical sets and historical root sets have a higher cohesiveness within phonaesthemic sets" and that " the lineage of a language plays an important role in the distribution of linguistic meaning" (ivi, p. 40). Last but not least, as recalled by Vineis (1983, p. 166), many onomatopoeic units (not immediately superimposable with the phenomenon of phonaesthesia – which is actually an establishment of correlations *a posteriori* between meaning and sound –, but certainly connected) are simply the product of phonetic evolution (cf. Fr. *siffler* < Lat. *sīfilāre*, rustic variant of *sībilāre*), and this means that diachronic analysis is essential to reveal cases of false onomatopoeia, for example.

The impression one gets is that the connection between synchronic phonaesthesia with Indo-European derivation (cf. §§ 4.1 and 4.3) is seen as "marginal", and not as the main motivation for historical phonaesthemic outcomes. The same can also be said for the historical results which have lost or modified a large part of the original radical structure and which therefore, as a result of various phonetic changes, are different both from the original phonaesthemic string and from that which is statistically more widespread among historical languages.

It is also important to also highlight phonaesthemes' significance as lexical incrementation enablers, triggering modal mental representations or schemas (Smith, 2014, p. 19): from a cognitive point of view, their plausible derivation from historical roots provided cohesiveness and, moreover, an underlying organization although languages undergo, some more than others, drastic changes over time. It seems to be more evident in the Germanic descent: in English above all – though statistically they seem to be pervasive broadly speaking in human languages (Thompson, 2017) – we observe a high level of semantic and morpho-phonological cohesiveness, displayed by the so-called cliques, series of terms all synonymous with each other (Boussidan et al., 2009, p. 36). What we don't know is to which extent this relatedness is attributable to historical roots or to phonetic similarity because new words' addition follows a clear path in adjusting to the previous inventory within a certain semantic area.

As stated by Bergen (2004, p. 2), despite being non-compositional in a traditional way, phonaesthemes display priming effects similar to the ones reported for compositional morphemes. This is not the result of semantic or phonological priming, or alone neither in combination; the key is, again, relatedness. Phonaesthesia is statistically pervasive in human

languages and seems to reveal itself as crucial in both production and perception of neologisms, posited as a consequence of experimental (Abelin, 1999), corpus-based (Otis & Sagi, 2008) and comparative studies (in particular, Blust, 1988; 2003, observed that onsets which express the same idea – as /ŋ/ in Austronesian, related to 'nose' or 'mouth' – seem not to be cognates, even if they are used with the same intention in other languages cf. Trukese *ŋú*, Amis *ŋafŋaf,* and Toba Batak *ŋaltok*, all referred to 'chewing' or 'ruminating' activities). As a matter of fact, it appears to play a key role in language, representing the lexicon and participating in both constructing and decoding neologisms. The troublesome aspect regards, as we have seen, phonaesthemes' morphological status, because they do not fit well into morphological models based on compositionality – making their effect unpredictable, because of the absence of implied hierarchical linguistic structures – such as Item-and-Arrangement's ones (Hockett, 1954).

The hypothesis of phonaesthemic clusters as triggers of the faciliatory priming process justifies, in some way, the statistical hyper-attestation in lexicon, making us guess about a morpheme-like behaviour – although less predictable and systematic, even if they can still show some potential compositionality under certain circumstances i.e., the juxtaposition of the rime /-eer/ or /-sh/ to the onsets – in language processing tasks (Bergen, 2004, p. 5). Therefore, they seem to be crucial for mental representation, even though the psychological reality of a linguistic unit, according to the standard linguistic test for evaluating, is given by compositionality combined with productivity (i.e., wug-test). In this regard, Magnus (2000) appeals to the neologisms' recognition and production criteria, supporting phonaesthemes' significance in producing/inferring generalizations and selecting the nearest neighbour words; be that as it may, it is still difficult to determine the extent of the whole process because it trespasses onto unconscious language and morphemes' decoding dynamics.

Going back to the reflections of Bertinetto & Loporcaro (1994), it is evident that the imitative relationships that are identified in the phonaesthemes and, more generally, in the phono-symbolic, phono-iconic and phono-indexical processes, are *a posteriori* since they are placed in the subjective sphere of the speaker and do not in any way undermine the principle of Saussurian arbitrariness (despite the fact that the evocativeness of the phono-indexical type is not determined accidentally by the language, cf. ibid., p. 170).

The analogical correspondences that the phonaesthemes constitute can actually be considered as real acoustic metaphors which are qualified as synaesthetic facts (cf. Beccaria, 1996, p. 317) and which express both sensorial perceptions and aspectual nuances (such as fixity, instantaneity etc.), confirming their multimodal nature. The secondary isomorphism typical of phonaesthemic processes, as we have seen, is based on a metalinguistic consciousness behind which are psychological mechanisms that should certainly be analysed in synchrony, in an attempt, made by the speaker, to motivate the linguistic sign to himself.

The morphological and psychological acknowledgement process of phonaesthemes is still ongoing (cf. §2.4). It aims to attribute to them some sort of functional role, already granted to the morpheme by both European and North American Structuralist morphological models. Hitherto, a substantial incompatibility emerged from research, mostly due to the impossibility

of breaking phonaesthemes down into morphemes (cf. §3.1), unless we start accepting, besides the well-known clusters, the resultant lexemes' residues without meaning. Problems like this, as we have seen, have encouraged psycholinguists to explore different solutions, such as productivity in coining neologisms or facilitation in interpretation; the psychological approach, counting on the statistical methodology focus, looks into frequency of use, building use-based morphological models such as the connectionist one (also known as the 'network model'). It is crucial to highlight the importance – if not the necessity – of a single-point grammatical description, in order to avoid watertight compartmentalisations that prevent the reconciliation of compositional (like morphemes) and psychological elements (such as clusters). Is it possible for psycholinguistics to compensate for a theoretical lack in the morphological field, if that means providing comprehensive modelling with better adherence to the linguistic reality? If phonaesthesia is a large-scale phenomenon shared by a considerable number of language families – although not attributable to the Greenberg's linguistic universals – this question is worth answering, hoping that future studies can shed light on a subject that is still so rich of research perspectives.

Acknowledgments

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Notes

Note 1. For further information about this peculiarity, see Kwon & Round (2015, pp. 1-27). Another interesting analysis about modularity is contained in Zingler (2017), who posited that is impossible to distinguish, in a psychological perspective, between phonology and morphology, which continue to overlap in phonaesthemes.

Note 2. Bolinger (1965, p. 245); Wales (1990, p. 339). That might explain the existence – and occurrence, of course – of certain prosodies in certain lexical contexts (Grace, 2005), in a comparative linguistic perspective.

Note 3. A more general overview about the weight of Wallis' contribution to English studies is given by Constantinescu (1974).

Note 4. At first, according to his two main biographies (Rebori, 2002; Plug, 2008), Firth's academic formation was historical. Once obtained his degree in 1913, he applied to the Indian Education Service for a job in Samawar, Punjab; this position, as Master of the Training Class for Teachers in European Schools, re-awakened his interests in language studies, allowing him to focus from another perspective on occidental linguistics. Firth perceived India as the cradle of phonetics, so it was easy for him to lay the foundation for a theory (nowadays known as Firthian Linguistics), centered on increasingly smaller language units of segmentation, until the final phoneme's rejection, both in terminology and concept. What the English linguist complains about is the lack of consensus around the topic because, at that time, every linguistic school offered its own definition without accepting others or even discussing them. Firth conceived it as a functional phonetic unit, a vehicle of lexical and grammatical functions, an autonomous entity from what is called 'speech sound' and, in the

end, a sum of sound variations depending on the context of the utterance (Firth, 1930; 1957). To go deeper into Firth's rejection of the phoneme theory and its consequences within the debate, see Senis (2015, pp. 279-291).

Note 5. It should be noted that according to Leonardi (2015, pp. 4-5) – who in turn refers to de Brosses' theories – this cluster might be also related to the swallowing act because of the articulation of a guttural, representing the throat cavity, followed by a liquid consonant, miming the sliding of a fluid; this explanation is invalidated by a different reconstruction of separated Proto Indo-European roots for some of the examined words (Boussidan et al., 2009, p. 41).

Note 6. Evidence of phonaesthemes is demonstrated not only within the Indo-European languages, but also in North American varieties (such as Wasco), African (e.g., EkeGusii in Kenya: see Omwansa et al., 2021, 84-100), Austronesian, Austro-Asiatic, and East-Asian languages (Mompean et al., 2020, pp. 518-519). See Blust (1988; 2003, pp. 187-212) for Austronesian language; Frisch & Zawaydeh (2001, pp. 91-106) speaking of Arabic phonaesthemes; Hamano (1998) regarding the sound-symbolic system of Japanese; Joseph (1994, pp. 222-236) for Modern Greek; McCune (1983) limited to Indonesian roots; Rhodes (1981, pp. 47-56) speaking of phonaesthemic evidence in Ojibwa verbs of breaking, and Zimmer (1969, pp. 309-321) about Turkish morpheme structures.

Note 7. "Dal punto di vista della verificabilità empirica, l'asserire che ad esempio [t] pot é essere usata come elemento significante in quanto direttamente imitativa sia di 'movimento brusco' sia di 'quiete, fissità, resistenza' equivale a dire che fu usata in modo arbitrario".

Note 8. "I rapporti sia di tipo iconico che mimetico hanno infatti sempre e comunque carattere secondario e soggettivo, sono cio è derivati dalla presenza nel lessico di alcune parole che fungono da elementi prototipici trainanti nelle stesse associazioni".

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