GRAPHS are concrete typographic or handwritten realizations of **BASIC SHAPES**, visual skeletons or the common visual denominators of all graphs of the same category. They are one part of **GRAPHEMES**, written signs that relate basic shapes with linguistic units (phonemes, syllables, morphemes).

GRAPHETIC ALLOGRAPHY (→FORM) hinges on material (here: visual) similarity (making it similar to allophony). Non-distinctive graphs must be visually similar to be considered graphetic allographs of the same basic shape.

PARADIGMATIC ALLOGRAPHY concerns allographs that occur across inventories, i.e., in different handwriting or different fonts. They potentially occupy the same slot but do not occur together in a minimal context. They are **stylistic** variants.

SYNTAGMATIC GRAPHETIC ALLOGRAPHY captures allographs that co-occur in sequence in the context of the same inventory, be it a given person's handwriting (at a specific moment in time) or a given font such as *10 pt italic Times New Roman*. For example, when a person writes the word <kitten> by hand, two graphs of the basic shape |t| are produced, and the same applies when the word is printed, as in <*kitten*>. In both cases, two instances of |t| occur. These two instances, as unique physical events, are **concrete graphs** and are syntagmatic variants of the same basic shape. They can be considered free allographs given that they can be replaced by each other, meaning the two instances of |t| in <*kitten*> might be switched. Note, however, that there might be effects of so-called **coarticulation**, especially in handwriting, as the forms of the preceding and following graphs and the graphomotoric movements of the hands and writing tools involved in producing them might affect the shape of the two instances of |t|, making them dependent on their specific position and, thus, **visually variable** and **non-exchangeable**.

FIGURE 1: Different typographic paradigmatic graphetic allographs of the basic shape |b|

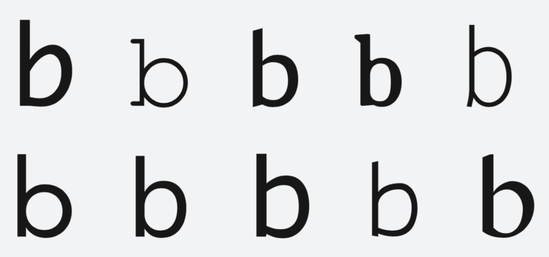

FIGURE 2:
The two |e|-graphs in this handwritten word are unique and syntagmatic graphetic allographs

PARADIGMATIC GRAPHETIC ALLOGRAPHY concerns the opposition of graphs across inventories, i.e., different people's handwriting or different fonts. For example, the |t| in the handwritten version of <kitten> and the |t| in the typographic version are paradigmatic graphetic allographs of the basic shape |t|. Since they are part of different inventories, they cannot occur together in a minimal context such as the word <kitten> (as it is uncommon to change the inventory in the middle of a minimal context such as a single word, e.g. ?<kit-en>). However, since they instantiate the same basic shape, they can occur in the same slot in a given written/printed word. Thus, all possible graphs that can materialise a given basic shape are considered paradigmatic graphetic allographs.

↑ MATERIAL LEVEL (GRAPHETICS)

Types of allography

Conceptualizing structural variation in writing at the material and linguistic levels

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LINGUISTIC LEVEL (GRAPHEMATICS) ↓

PARADIGMATIC GRAPHEMATIC ALLOGRAPHY pertains to those basic shapes that occupy the same slot and thus do not occur together in any (minimal) context. Examples from Roman script are the basic shapes |a| and |ɑ| as well as |g| and |ɡ|. The units in these pairs are visually too dissimilar to count as graphs of one basic shape. They are rather distinct basic shapes that are—in English and German, for example—assigned to the same graphemes: <a> and <g>. The knowledge necessary to identify them as variants of one unit is **graphematic**: it comes from knowing that they have the same linguistic function and not from recognizing a (non-significant) visual similarity that might exist here but is absent from many other instances of graphematic allography. Ultimately, the choice between them is **free**, but in a given minimal context it is nonetheless fixed. For example, once |g| has been chosen, switching to |ɡ| in the immediate context, e.g. a portion of text such as a word or a sentence, is very uncommon (but not impossible or orthographically prohibited), cf. ?<bigger>.

Can also be found in the writing system of Chinese in the form so-called **variant characters** (*yìtǐzì* 異體字). As Chinese is a morphographic system, these variant characters are basic shapes that relate to the same morphemes and do not individually have any other function besides that. Examples include |峰| and |峯| for *fēng* 'mountain top', |群| and |羣| for *qún* 'group, flock' (cf. Galambos 2015). The units in these pairs are functionally equivalent, but it would be strange to use them together in the same minimal context (e.g. the same sentence or even the same paragraph). By contrast, in a larger context such as a newspaper title page, it would not be strange if one of them occurs in the headline and the other in the running text, for example.

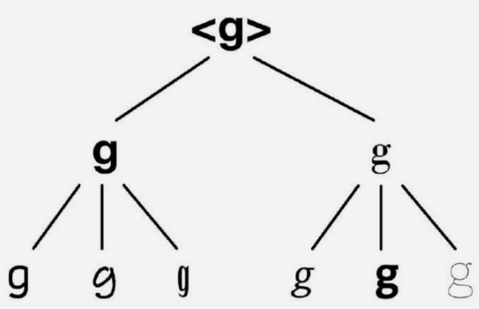

FIGURE 3:
Two paradigmatic graphematic allographs of the grapheme <g> and, below that, three paradigmatic graphetic allographs, respectively.

SYNTAGMATIC GRAPHEMATIC ALLOGRAPHY concerns basic shapes that occur together in a given context but are complementarily distributed, i.e., never occur in the same slot. This type of allography is reminiscent of complementarily distributed allophony as exhibited by the allophones [ç] as in *ich* /ɪç/ 'I' and [x] as in *Nacht* /naxt/ 'night' for the German phoneme /x/, which never occur in the same positional contexts.

The most prominent example in writing is **positional allography** in writing systems using Arabic script. Here, most graphemes have four different positional allographs: an allograph that occurs in isolation and three connected allographs that occur either at the beginning, the middle, or the end of a word or string of basic shapes. For example, the grapheme <ب> has |ﺏ| as its isolated form, |ﺑ| as its initial form, |ﺒ| as its medial form and |ﺐ| as its final form. Another well-known example of syntagmatic graphematic allography comes from Greek, where the grapheme <σ/ς> has two positional variants: |σ| occurs word-initially and word-medially, while |ς| occurs only word-finally.

GRAPHEMATIC ALLOGRAPHY (→FUNCTION) deals with different basic shapes that, because they have the same function, are assigned to the same grapheme. They may but need not be visually similar. In this respect, graphematic allography is conceptually similar to allomorphy, where allomorphs can be phonologically similar (such as the English plural allomorphs [s], [z], [ɨz] in cats, dogs, and houses, respectively) but do not have to be (such as *go* and *went* as allomorphs of the lexeme GO).

SYNTAGMATIC ALLOGRAPHY concerns allographs that occur in the same sets, i.e., in the same person's handwriting or the same font. They do not occupy the same slot, they are position-dependent. They are **system-inherent** variants.

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