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The presentation of word meaning through ostensive aids in (electronic) dictionaries

ABSTRACT

The presentation of word meaning through ostensive aids in (electronic) dictionaries

This article explores the integration of visual elements (ostensive aids) into electronic lexicographic resources, focusing on their role in enhancing the description and understanding of word meanings, particularly crucial during the translation process. While traditional lexicography primarily relies on text-based definitions, visual aids (such as illustrations, photographs, videos, and diagrams) can offer additional, non-verbal information that enriches the user's comprehension of the concepts underlying each word, and clarify the semantic distribution of a given concept across several lexemes. An analysis of the semantic field WATERCOURSE shows that the selection of a proper equivalent in the target language is influenced by the semantic distinctions peculiar to a language. This exploratory study investigates the conditions under which a lexical unit in a dictionary should be accompanied by a visual aid, explaining in each case its relevance and purpose. By formulating a utility criterion, the conditions that should be met in order to fulfil it are being specified. These conditions encompass several cases, such as the representation of concrete entities, cultural elements, prototypes, and actions, as well as polysemous words. They further establish the foundation for a preliminary methodology that aims to systematically integrate visual aids into lexicographic resources and will be finalized in future research. This methodology is currently being tested on the PAD model (Phrase-based Active Dictionary), and should identify *when* and *how* ostensive aids provide meaningful, pragmatic information that verbal definitions alone cannot convey.

Keywords: visual aids, ostensive aids, semantic fields, word meaning disambiguation, polysemy, multimedia elements in lexicographic resources

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1. Introduction

There are cases in which "a picture is worth a 1000 words" and others in which linguistic descriptions are most appropriate for grasping the gist of a word or of a sentence. In lexical resources for translation, pictures, illustrations (drawings), schemes, terminological diagrams, frames, videos, and other visual aids (like GIFs or other types of animations) are of prime importance and, in several cases, they are the only useful tool for finding the proper correspondence in the target language. This is particularly true for technical vocabulary for specialized translations; however, even common words display in many cases a different semantic distribution that needs to be taken into consideration when translating into a target language lacking these differences or some of them (cf. Coseriu 1978/1973: 25). Understanding the differences in the concepts behind words is a key process for language learning too, and also in this case, visual aids enhance vocabulary comprehension and memorization (cf. Paivio's *Dual Coding Theory* 2010: 211; Svensén 2009: 298–299; Dziemianko 2022: 219). Despite the usefulness of visual elements during the translation and language learning process, users can currently only rely on some multilingual visual printed dictionaries and a few online resources which are not always conceived and built in a systematic, ontologically coherent way for these purposes.

Against this background, I argue why and in which cases ostensive aids (i.e. visual representations) are required for word meaning disambiguation (in Section 2). I then survey selected current resources available to the users and outline their limitations (Section 3), and explain what the theoretical and practical challenges of the use of visual aids are (Section 4). Section 5 sets out preliminary conditions for integrating visual aids into lexicographic resources, with specific reference to the *Phrase-based Active Dictionary* (PAD), a new kind of advanced learner's dictionary developed by Giacomini and DiMuccio-Failla as one of the three components of the PhraseBase project (cf. Giacomini 2025; DiMuccio-Failla 2025; DiMuccio-Failla/ Giacomini 2022). I conclude by summarizing the observations, discussing their implications within the broader context of (learner's) lexicography, and addressing outstanding challenges (Section 6).

2. On the relevance of a multimedia approach in lexicographic resources for translation and language learning

In Section 2.1., I justify the selection of resources referenced in this article. Section 2.2. shows how multimedia elements support the disambiguation

of concepts within a given word field and deepen semantic understanding. Section 2.3. examines the role of multimedia aids in understanding cultural concepts and considers their implications for translation and language learning.

2.1. Selection of lexicographic resources

Before discussing the question of the relevance of multimedia elements in lexicographic resources, it is necessary to define which resources I refer to in this article. A wide range of resources is available for translation, spanning from lexicographic reference works to virtually any information that can aid in finding the appropriate equivalent in the target language. Even pictures or illustrations, with or without captions, found on the internet can be considered valuable sources of information. Lexicographic resources can comprise bilingual dictionaries, monolingual dictionaries, specialized dictionaries, terminological databases, glossaries, encyclopedias and visual dictionaries (for a detailed overview see Albrecht 2013/2005: 60–76). In this article, I will not address specialized language use, and concentrate solely on general language, focusing particularly on the treatment of highly frequent words with a different semantic distribution in two or more given languages, as this topic has not yet been addressed in the context of visual cues. I will not analyze bilingual dictionaries, but concentrate on monolingual ones, in particular on monolingual learner's dictionaries for English. I will also analyze BabelNet®, a multilingual lexical information system initiated by Navigli and Ponzetto (cf. Navigli/ Ponzetto 2012; Navigli et al. 2021) and based on WordNet®, Wikipedia, and Wiktionary (among other lexical and ontological resources), because it distinguishes itself through its integration of lexical and encyclopedic knowledge, its multilingual coverage, and its network-based structure. Accordingly, a comparison of the approach to the use of multimedia elements in traditional dictionaries and this non-traditional lexical resource, BabelNet®, is warranted to see how different designs influence information retrieval and semantic understanding.

Although language learning and translation are fundamentally different activities—language learning being primarily acquisitional and translation being an act of bilingual mediation—they share several cognitive and practical processes. Both require a deep engagement with lexical, syntactic, and pragmatic aspects of the language. Advanced learner's dictionaries provide explicit definitions, usage notes, collocations, and example sentences that aid not only in comprehension but also in production, especially in the target language of translation. These features can be particularly beneficial for novice translators or those working into a non-native language. Translators, even at an advanced level, frequently encounter production challenges that learner's dictionaries can help resolve.

A monolingual dictionary for translation should fulfill a range of specific criteria that meet translators' needs (see on this topic Giacomini, forthcoming). The translator, on the one hand, looks up information relative to the use of words in context and, on the other hand, to possible discrepancies in the conceptual structure of a given word, comparing it to the one in their L1/source language. The discrepancies in the conceptual structure concern, for example, semantic extensions of the core meaning through metonymic and metaphorical shifts. A monolingual dictionary intended for translation should deliver information that is to a higher degree *contrastive* in comparison to monolingual dictionaries for native speakers: the lexicographers should opt for displaying a more detailed presentation and explanation of semantic differences, including those among similar words belonging to a given semantic field, placing greater emphasis on cultural information, and contrasting synonyms semantically with respect to their contexts of use (see Bergenholtz/Tarp 1995: 60–63 for a discussion on encyclopedic information and comparative descriptions in *bilingual* dictionaries, and ten Hacken 2016 for an overview of theoretical perspectives on compiling monolingual versus bilingual dictionaries).

In this regard, the PAD model is an exception. The PADs constitute a group of monolingual online dictionaries for advanced learners (C1–C2) that are fully phraseologically based—thus prioritizing first and foremost the typical context of use of a lexeme; each lexical unit in the PAD is a *phraseological usage pattern* (cf. DiMuccio-Failla 2025: 20). Creating cross-references could make the translation orientation even more explicit and thereby yield a multilingual resource. The PADs can therefore be regarded as dictionaries that address hybrid needs: language learning and translation.

With respect to encyclopedic information and visual aids, Klosa (2016: 520; 530–531) notes that there is a long tradition of incorporating illustrations in printed general language dictionaries, but problematic aspects—concerning the number and types of illustrations to use—remain challenging for electronic dictionaries as well. Although this statement dates back to ten years ago, it still largely holds today: there is no documented guidance on practical conventions and criteria for illustration use in lexicography, and current practices often address core issues such as polysemy, interpretive ambiguity, connotations, cultural nuances, and gender neutrality insufficiently. For example, the picture of body in OALD10 and OALDo (2025) is identical and unchanged, depicting a young white male body. A picture of *scone* (a small round cake typical of the British and American culinary culture) appears in CALDo (2025) but not in OALDo (2025): from a learner's perspective, such an illustration is extremely helpful and supports understanding. The use of illustrations has not yet been *systematically* implemented in online versions (where space constraints are not

an issue), and a more extensive use of more modern aids (animations, GIFs, videos, AI-generated multimedia aids) remains underexplored.[1]

It is worth investigating why ostensive aids still receive limited attention in both practical and theoretical lexicography. Practical lexicography seems to overlook the actual benefits of a systematic use of visual aids: even when illustrations are used, entries rarely accommodate multiple illustrations paralleling a word's polysemy, and photographs predominate, despite calls by some researchers for drawings.[2] In theoretical lexicography, little research is dedicated to this topic in comparison to verbal definitions, overlooking the power of visual language in meaning explanations.

2.2. Ostensive aids for disambiguating concepts in a given word field

How can monolingual learner's dictionaries benefit from multimedia elements? Multimedia elements can help clarify semantic differences of lexemes within a given semantic field. A word field is a DE "Bedeutungszone", i.e. EN 'semantic zone': its meaning is distributed or scattered across various lexemes, each having a different semantic trait but sharing some core ones with the others (cf. Coseriu 1978/1973: 25). The semantic structure of a word field can differ between languages, thus having an impact on translation. Coseriu (1978/1973: 74) noted that: "[…] Sprachen sich nicht dadurch unterscheiden, was sie sagen *können*, sondern dadurch, was sie *unterscheiden müssen*."[3] This can be illustrated by the contrasts in (1).

1. a. DE *Blume* and *Blüte* ↔ IT *fiore*
   b. DE *Sprache* and *Zunge* ↔ IT *lingua*
   c. DE *gehen* and *fahren* ↔ IT *andare a piedi* and *andare con un mezzo*

In (1a), DE *Blume* refers to a flower as a whole, and DE *Blüte* refers to the blossom or the flowering part of a plant, which includes the colored upper part of a flower. It can also refer to flowers on trees, particularly when describing blossoms collectively. The semantic difference is compulsory in DE and there is no equivalent for *Blüte* in IT, since IT *fiore* covers both meanings (EN 'flower/

1| If space constraints are not an issue anymore in electronic dictionaries, costs still are. A more modern approach with a different variety of multimedia aids implies higher costs.

2| For example, through a controlled experiment, Dziemianko (2022) compares the effectiveness of color pictures, greyscale pictures, and line drawings against entries with no visual aids. The results indicate that line drawings are the most effective tool, as they lead to the highest levels of both immediate and long-term retention while reducing the time needed to understand a definition.

3| EN 'Languages do not differ in what they can say, but in the distinctions they have to express' (my translation, LR).

blossom'). In (1b), IT *lingua* in the sense of DE *Sprache* (EN 'language') may be specified by the adjective *parlata/scritta*, but this only in the cases in which it should be intralinguistically contrasted (EN 'spoken/written language'). Otherwise, in the general sense of *speaking a language*, IT *parlare una lingua* (DE *eine Sprache sprechen*), the adjective is omitted. In (1c), DE *gehen* means 'to go on foot' and DE *fahren* 'to go by using any means of transport'. Here, prepositional phrases are needed to specify the two lexemes in DE, since in IT this distinction is not lexicalized, even though it is possible to express both concepts by using additional specifiers (in EN it is the same).

The contrasts in (1) illustrate the language-specific differences in the semantic distribution of some semantic traits in DE and IT. As Coseriu (cf. 1978/1973: 75–77) observed, there are semantic differences whose expression is compulsory in one language but not in another (e.g. DE *Blüme/Blüte* vs. IT *fiore*); there are semantic traits that may or may not be specified (e.g. DE *Sprache/Zunge* vs. IT *lingua* [parlata/scritta]); and there are cases in which the semantic difference must be marked with other means (e.g. IT *andare a piedi* / *andare con un mezzo* vs. DE *gehen/fahren*).

For (1), the integration of multimedia elements presenting the meaning of the lexemes would enhance the exemplification of the meaning contained in otherwise solely verbal definitions. For (1a), when translating into German, *Blume* and *Blüte* must be used distinctively and, in order to do so, a picture of a flower, accompanied by a caption and with labelled flower's parts (among which: *Blüte*) is the most immediate tool for understanding the semantic difference at the base and choose the proper equivalent in the target language accordingly.[4] It could be argued that this difference pertains to specialized language use only. However, the contrastive use of *Blume/Blüte* is typical of common language use too. In Figure 1 (p. 157), we see an example of DE *Blume*, EN *flower* and IT *fiore*.[5] In Figure 2 (p. 157), we see an example of DE *Blüten* (pl.), EN *blossoms* (pl.), and IT *fiori* (pl.).[6]

Italian learners of German have to draw a lexical distinction every time they see or refer to a blossoming tree like the one in Figure 2. For language learning, the general consensus is that visual elements facilitate the learning process and augment the retention of vocabulary (see Heuberger 2017: 303–304 on the relevance of illustrations in a monolingual learner's dictionary, and Dziemianko 2024: 34 for the use and usefulness of pictures in e-dictionaries).

4| In a good dictionary, illustrations come with a caption (more in Section 4). Only captions can ensure the correct interpretation of an illustration.

5| © https://www.schoener-wohnen.de/einrichten/garten-terrasse/schoene-blumen-fuer-vase-topf-wintergarten-balkon-und-beet-12636168.html (accessed: 11.04.2025).

6| © https://www.dingers-blog.de/2023/03/31/was-ist-eigentlich-die-kirschbluete-und-was-macht-sie-so-schoen/ (accessed: 11.04.2025).



Figure 1: DE Blüten (pl.), EN blossoms (pl.), IT fiori (pl.)



Figure 2: DE Blume, EN flower, IT fiore

As Hupka (1989: 193) rightly points out, the presence of pictures not only provides the users with informational clues but also raises their awareness of certain semantic difficulties, thereby sensitizing them to the topic. Stein (1991: 116) highlights the use of "differentiating labels" in the 2nd print edition of the *Longman Dictionary of Contemporary English* (LDOCE2) and the 4th print edition of the *Oxford Advanced Learner Dictionary* (OALD4) for lexical items where "there is a real or assumed relation of contiguity between the different objects shown and labelled in the picture". For example, she reproduces an illustration in OALD4 captioned "glove" that shows three types of gloves, each with a differentiating label: *glove*, *mitten*, *gauntlet* (cf. Stein 1991: 116). In effect, the semantic field "glove" is displayed with a selection of its instantiations. In this way, learners of EN are informed about three lexemes belonging to the semantic field of GLOVE (SMALL CAPITALS indicate a concept), are able to identify their referents in the real world through the mediation of the illustration, and can immediately determine whether their L1 draws the lexical distinctions, or if there is, for example, only a single word for *glove* and *gauntlet*. Even though Stein's analysis does not directly address the indirect benefits of this practice for translation or cross-linguistic correspondence, it is noteworthy: her overview of some well-established lexicographic practices used in the past for illustrations in printed dictionaries reminds us of how valuable these could still be today.[7]

7| Today, only OALDo (2025: *glove*) displays an illustration of the semantic field with tree types of gloves: *fingerless gloves, mitten, glove*. CALDo (2025: *glove*) has a single photograph of a pair of leather gloves (with no caption); COBUILDo (2025: *glove*) has a single (pixelated) photograph of a pair of wool gloves (with the caption "image of *glove*"); LDOCEo (2025: *glove*) has a single photograph of a pair of ski gloves (with no caption); MWALEDo (2025: glove) displays no illustration.

2.3. Ostensive aids for understanding cultural concepts

Another area in which ostensive aids are of major relevance is the one of cultural elements. Cultural elements encompass a wide range of items and processes (e.g. rituals). They can concern food, clothes, gestures, living spaces, means of transport, special tools, festive occasions, beliefs, rituals, traditions, political and educational systems etc. In translation theory, *realia* refer to cultural elements that have no equivalents in the target language and target culture, so being particularly challenging to deal with when translating (cf. Markstein 1999). Realia are therefore difficult to understand when the translator/language learner cannot come up with any mental representation of the word because they lack either the necessary linguistic or encyclopedic knowledge (Siever 2022/2015: 111). Giacomini et al. (2022: 7) demonstrated that online English monolingual dictionaries for learners—the *Cambridge Advanced Learner's Dictionary* online (CALDo), the *Collins Cobuild Learner's Dictionary* online (COBUILDo), the *Longman Dictionary of Contemporary English* online (LDOCEo), and the *Oxford Advanced Learner's Dictionary* (OALDo)—predominantly offer definitions for culture-specific entities/concepts from a native-speaker-centered perspective, keeping encyclopedic information to a minimum, which is, on the contrary, exactly what users of a foreign culture need in order to grasp their meaning. With few exceptions, pictures/multimedia visual aids are not systematically provided in these resources. This study highlights the fact that the treatment of cultural elements in lexicographic resources for learners of English is not carried out in a systematic way considering the needs of a foreign user, who needs a more detailed contextualization and more pragmatic information than a native speaker. In this article, I will analyze another domain relevant to non-native speakers: the one of semantic fields, which I define as groups of lexemes sharing one or more sememes.

3. State of the art of selected current online lexical resources

In this section I give an overview of some current online lexical resources available to the users and outline their limitations. I focus on four monolingual online dictionaries, and in particular, on English monolingual learner's dictionaries (viz. CALDo, COBUILDo, LDOCEo and OALDo). For German and Italian, there are at the moment of writing no learner's dictionaries available online for free (in particular, for Italian, the format "learner dictionary" does not exist yet; there are "edizioni minori" of general dictionaries, i.e. 'abridged/concise editions,' or dictionaries explicitly compiled for school kids or younger

students).[8] For this analysis, I also take into account another online resource: BabelNet® (v5.3, 2025), a multilingual encyclopedic dictionary and semantic network freely available online because it is particularly interesting for its use of illustrations.

In order to show how these resources perform in employing multimedia elements to enhance meaning disambiguation for a given semantic field, I looked up the entries of the following lemmas: *river*, *stream*, *brook* and *torrent*. This semantic field is particularly interesting because, without a visual aid, it is difficult to understand how the descriptive adjectives contained in the definitions (e.g. *large*, *small*) are to be interpreted in relation to these watercourses: the concepts corresponding to the denotations are difficult to evoke unambiguously. The semantic field of WATERCOURSES is admittedly bigger than the one I analyze here: it may include lexemes such as *waterfall*, *creek*, *dam*, *channel*, *wetland*, and even *lake* (if it is considered as the part of a watercourse where a river "rests" before flowing further as an *outlet*). For the purpose of this analysis, I have narrowed the semantic field to the set of lexemes listed above because the sememes that constitute their meanings are challenging to conceptualize. Differences regarding the location of the watercourse, its extent, its source, its mouth and its flow can determine its naming.

In Table 1 (pp. 160–161), I list the definitions of the selected lemmas available on CALDo, COBUILDo, LDOCEo, OALDo, and BabelNet®, and give information about the availability of visual elements and their effectiveness. I report only the definition for the BE variant.

From all the resources listed in Table 1 (pp. 160–161), only CALDo provides appropriate, high-quality pictures that helps the user to fully grasp the semantic differences between the given lexemes. However, it does not provide a picture of *torrent* (nor do the other dictionaries). From the definition it is not clear if *torrent* can also apply to refer to STREAM or BROOK.

The pictures delivered by COBUILDo are pixelated and only up to a certain point of help: the picture related to *stream* could easily also apply for *brook*. LDOCEo does not provide any visual elements.

OALDo adopts a different medium: an illustrated frame (i.e. a scene, in this case a landscape of a prototypical countryside), where different elements/participants to the scene are depicted and numbered (e.g. besides *river* and *stream*, I found *hill*, *farm*, *farmhouse*, *field* etc.).[9] This is particularly useful to understand the difference in extent between RIVER and STREAM. The

8| Cf. *Lo Zingarelli Minore* (2021), il *Dizionario medio di italiano Garzanti* (2024), *Il Devoto-Oli minore* (2025). For German, the app *Netzverb* (https://netzverb-dictionary.app) is specifically designed for learners, but it is not relevant for my analysis since it does not contain any illustration for the lemmas I chose.

9| OALDo itself does not label this visual element as "frame".

Table 1: Watercourses in English monolingual learner's dictionaries and BabelNet®

Dictionary and lemmas	*Definitions*	*Visual elements*
CALDo		
river	A natural wide flow of fresh water across the land into the sea, a lake, or another river.	Yes, picture (high resolution).
stream	Water that flows naturally along a fixed route formed by a channel cut into rock or ground, usually at ground level.	Yes, picture (high resolution).
brook	A small stream.	Yes, picture (high resolution).
torrent	A sudden large or too large amount, especially one that seems to be uncontrolled.	No.
COBUILDo		
river	A river is a large amount of fresh water flowing continuously in a long line across the land.	Yes, picture (low resolution).
stream	A stream is a small narrow river.	Yes, picture (low resolution).
brook	A brook is a small stream.	No.
torrent	A torrent is a lot of water falling or flowing rapidly or violently.	No.
LDOCEo		
river	A natural and continuous flow of water in a long line across a country into the sea.	No.
stream	A natural flow of water that moves across the land and is narrower than a river.	No.
brook	A small stream.	No.
torrent	A large amount of water moving very quickly and strongly in a particular direction.	No.
OALDo		
river	A natural flow of water that continues in a long line across land to the sea.	Yes, illustrated frame of *countryside* with several numbered elements, including a river (nr. 20).
stream	A small, narrow river.	Yes, same frame of *countryside* (*stream* is nr. 34).

Continuation of Table 1

Dictionary and lemmas	*Definitions*	*Visual elements*
OALDo		
brook	A small river.	No.
torrent	A large amount of water moving very quickly.	No.
BabelNet®		
river	A large natural stream of water (larger than a creek).	Yes, 28 pictures (including maps), but some of them do not meet the definition or are patently incorrect.
stream	A natural body of running water flowing on or under the earth.	Yes, 30 pictures (including maps); some of them do not meet the definition, are patently incorrect or identical with the ones for *river*.
brook	A natural stream of water smaller than a river (and often a tributary of a river).	Yes, 12 pictures; some of them do not meet the definition, are patently incorrect or identical with the ones for *river* or *stream*.
torrent	A violently fast stream of water (or other liquid).	Yes, 12 pictures identical with the ones of *brook*.

illustrated stream flows into the river and it has a lower discharge than the river. In CALDo, on the contrary, the picture of *stream* shows a prototypical mountain stream (that can be also valid for *brook* (!)), which evokes another kind of prototype than the one illustrated in OALDo. In this regard, the OALDo expedient of an illustrated frame is most unambiguous, since it evokes a concept both for *river* and *stream* and, in addition, it delivers implicit information about the relation between the two (i.e. the stream being smaller than the river and flowing into it). The advantage of an illustrated frame is that it evokes a prototypical scene which, though being hard to find as it is in the real world, provides symbolic information about relations and roles that are always stable, no matter if reality is slightly different than the one depicted. In this sense, drawings and illustrated frames are more adequate than pictures (i.e. photographs) because they are naturally symbolic (and thus evoking more flexible concepts) and at the same time truthful in displaying functions, roles and relations. Pictures/photographs, portraying real entities, evoke rather rigid

concepts that tend to suggest identity (A [stands for] A) rather than symbolic value (A [stands for a similar] A) (more in Section 4 and 5).

Moving to BabelNet®, the strategy of delivering multiple pictures/photographs for a single lexeme/concept helps convey the idea that they do have a symbolic value, precisely because they are a group of possible instantiations of a single concept. Two problems are, however, linked to this strategy. The first is related to the actual output: several pictures do not fit the definition. For instance, among the pictures delivered for *brook* we find: two close-up photos showing clear water from above, one from the front (so that it is impossible to see the extent); one showing a glacial stream (which is not labelled as such); one showing wetland/a sort of swamp; one showing a ditch in a field; one showing a creek (a *creek* in AE means 'small stream or river', cf. COBUILDo 2025: *creek*). It is clear that this selection is not accurate. The second problem is logical and it mirrors the difference between intensional and extensional definitions. In intensional definitions, the shared properties of the instantiations of the concept are listed in the definition to make it distinguishable from other (similar) entities. Translated into visual language, this corresponds to giving a prototype representation (picture or drawing) of the entity, visually enhancing the properties of the given entity, e.g. by photoshopping it in case of photographs, or by drawing these properties manually in case of drawings. In extensional definitions, entities sharing the same necessary and sufficient features are listed as the extension of the concept itself, the problems in this case are, firstly, making sure to cover the whole range of entities, and, secondly, keeping this range up to date. Transposing this into visual language, it means that delivering a group of pictures may suggest that these and only these depicted entities are the sole possible instantiations of the concept evoked by the given lexeme, like in the case of BabelNet®. This strategy should be avoided if the pictures delivered here are randomly selected or if no information is given about their nature (i.e. how they were selected) or about their role in the entry of a given lemma (e.g. explicitly stating that the selection is not exhaustive or it contains also several other pictures that do not directly correspond to the specific meaning).

Each of the online resources I analyzed exhibits problems concerning the systematic or ontologically coherent use of visual elements. The User Guides on the dictionaries' websites provide no information on the criteria for selecting visual elements or deciding whether to display or omit them.

In the translation process of the semantic field WATERCOURSE, the presence of pictures accompanying the definitions is helpful for disambiguating the meaning and facilitates the selection of the most appropriate equivalent in the target language. During the translation process, the presence of a visual element is essential in understanding whether the semantic differences have

a distinctive value in the target language too or whether they are irrelevant. For instance, in Italian, *stream* can be translated with *ruscello* and *fiume*; at the same time, IT *ruscello* corresponds to EN *brook*. EN *brook* can, on the other hand, also be translated with a variant: IT *fiumiciattolo* (EN ~*small stream*). Moreover, IT *torrente* (EN *stream*) has a partial semantic overlap with EN *torrent*. In German, the semantic distribution of the lexemes *Fluss* (EN ~*river*), *Bach* (EN ~*stream*, *brook*), *Wildbach* (EN ~*brook*) is similarly difficult to understand and may lead to translation problems.

4. Problems related to the integration of ostensive aids in lexicographic resources

Not every lexeme can be visually represented. For example, abstract concepts like PHILOSOPHY cannot be represented intrinsically but could instead be depicted through a semiotic element that is somehow related to PHILOSOPHY, such as a picture of an edition of Aristotle's *Metaphysics* (which would be reductive or even misleading anyway). Furthermore, even when a lexeme can be visually represented, the depiction may not always be relevant for word meaning disambiguation. For instance, pictures of spices do not reveal much about their actual taste, and the difference between *sweet paprika* and *harissa* is better described than depicted. From these observations, the questions that arise are:

1. What kind of ostensive aid is most appropriate for a given concept?
2. What theoretical and practical issues related to the integration of visual elements need to be addressed?

Beginning with (1), it is useful to enumerate the types of ostensive aids currently available and examine their application.

There are several types of ostensive aids: In Table 2 (p. 164–165) I list those identified by Svensén (2009), but I add some multimedia elements that he did not consider, because his focus is restricted to print dictionaries (my additions are marked with an asterisk). I also provide their scopes, their advantages, and limitations in respect of their integration into electronic dictionaries. Ilson (1987) offers finer distinctions among types of illustrations. He adopts a broader understanding of "illustration," a concept that for him also includes tables, diagrams, and "all forms of non-linear presentation" (Ilson 1987: 193). For example, he distinguishes among *partonomies*, *chains*, *networks*, *paradigms*. These distinctions are not yet relevant for this research.

Considering the scopes listed in Table 2, it could seem straightforward to assign each type of ostensive aid to a given part of speech: for instance, pictures for nouns, and animations for verbs. However, such a one-to-one correspondence cannot be established. Even a static picture depicting a "frozen movement"

Table 2: Types of ostensive aids for electronic dictionaries

types of ostensive aid	*scope*	*advantages*	*limitations*
Illustration/ drawing: in b/w in color hyper realistic (hand or digital)	To represent especially concrete entities.	It shows more typical features than a description; One can choose what most typical properties should be particularly represented/ highlighted.	It concerns appearance rather than function; It does not conceive all conceivable varieties of the object.
Picture/ photograph: in b/w in color	To represent especially concrete entities; To show an object in its authentic surrounding.	More realistic; It shows the object in its natural surroundings.	Typical properties cannot be chosen: The picture (non-photoshopped) shows everything as it is; It does not conceive all conceivable varieties of the object.
*Icon/symbol/ sign/logo (drawn or photographed)	To reproduce actual icons, symbols, signs and logos and make them recognizable.	More effective than a description.	–
*Smiley/emoji	To represent typical emotions in a visually coded way.	Controlled and limited range of types to choose from.	Lack of precision; Interpretation of a smiley/emoji is context driven.
*Cartoon drawing	To represent people's actions in a playful way.	More entertaining and engaging for younger users.	Graphic illustrators (or valid AI image-generators) needed.
*Illustrated taxonomy	To represent concrete entities and their components (meronymy).	More accessible and approachable than a description.	Phenotypic variability cannot be captured; Scale accuracy must be ensured.
Illustrated diagram	To represent processes in a schematic way.	It summarizes in a schematic way longer descriptions; Visually impactful.	Risk of oversimplification.

Continuation of Table 2

types of ostensive aid	*scope*	*advantages*	*limitations*
*Illustrated semantic field	To represent entities that share some features and belong to the same conceptual category.	Faster comprehension; Reduced ambiguity; Visual mapping of the category.	Draw the boundaries of the category.
Illustrated setting/scene (frame)	To represent participants and their roles in a given situation.	It shows all the entities involved in a specific situation and not in isolation.	Complex to design.
*Animated frame	To represent participants, their roles, their functions and their movements in a given situation.	It shows all the entities involved in a specific situation and not in isolation; It combines visual and kinesthetic cues.	Complex to design and animate.
*GIF/ animation	To represent short functions and short movements. To represent emotional/facial expressions.	Less data capacity required than videos (= less megabytes); It combines visual and kinesthetic cues.	Lack of contextualization.
*video	To represent action verbs, complex/long movement, complex functions. To include noises of the surroundings.	Detailed and realistic demonstration; It combines visual, auditory and kinesthetic cues.	More data capacity required than videos (= more megabytes); Expensive (= complex to film).

(e.g. a hairdresser cutting hair) accompanied by an underlying caption featuring the given verb (e.g. *to cut*) could be as effective as an animation (see also Stein 1991: 110–111 on the representation of verbs by means of illustrations). As a general rule, visual elements should always be accompanied by captions, as captions are essential to elicit the right interpretation by the user. In certain

instances, arrows are also necessary to further clarify the reference. However, captions containing single lexemes isolated from the context can lead to ambiguity (e.g. the verb *to cut* without an object versus *to cut* with an object, such as in *to cut hair*). This issue is connected to the broader theoretical question of how polysemy is treated in "traditional" dictionaries.

In traditional dictionaries, the different meanings of a word are usually displayed in hierarchical order, with a limited number of main senses to which groups of sub-senses are attached (cf. Svensén 2009: 211–212). The main sense and the sub-senses are constituted by isolated lexical units or by a lexical unit embedded in a very general argument structure (e.g. *to cut something* vs. *to cut something by…*, where "something" is not specified, and the dots after "by" suggest that pretty much any kind of semantic type is allowed, cf. OALDo 2025: *cut*). The examples listed under each sense undoubtedly help contextualize the word, but the word senses per se consist of unspecified and often isolated lexical units. This approach has some drawbacks. In fact, in the case of the verb *to cut*, the different possible types of direct objects determine the type of cutting tool and thus the underlying picture. For instance, in OALDo (2025: *to cut*) the third sense indicated by the disambiguator "hair/nails/grass" unifies three different concepts, in which one involves the use of scissors or clippers as a cutting tool for cutting hair; the second, the use of a pair scissors or a nail clipper for cutting nails; and a third, the use of a (push) mower or a lawn trimmer for cutting grass.

In the PAD, on the contrary, not isolated words, but words in their "contextual patterns of normal usage" (Sinclair 2004: 133) are considered the core lexical units of language and are thus treated as such. This means that the LUs of the PAD are formulated taking into consideration the common types of subject and the common types of objects occurring in the argument structure of verbs (and of adjectives, nouns, etc.) (cf. DiMuccio-Failla/ Giacomini 2017a; 2017b for a detailed description of the theoretical basis of the project, which integrates insights of John Sinclair and Patrick Hanks). This leads to the formulation of *normal word usage patterns* that are the actual lexical units of the dictionary each corresponding to a different sense (cf. DiMuccio-Failla 2025: 19–23), and thus disambiguating meanings and concepts in finer details (more in Section 5).[10]

A further issue that is connected to a theoretical problem of linguistic and cognitive nature is: what is the prototypical concept evoked by the meaning of a word? Necessary and sufficient conditions do not always make it possible to

10| For the verb *to cut*, in the PAD there would be two different lexical units (among others): The lexical unit *somebody cuts (somebody's) hair/nails [using scissors or clippers]* and the lexical unit *somebody cuts the grass [using a (push) mower or a land trimmer]*.

unambiguously identify or classify a given entity (cf. Labov 2004/1973). In some cases, information regarding typicality, function, purpose, and context of usage is necessary to develop a prototype/prototypical concept (cf. Labov 2004/1973, Rosch/ Mervis 1975, Rosch 1978). Representing prototypes is challenging. Pictures refer to a concrete entity in the real world and can carry several connotations that may or may not be intentional. Some of the intentional or unintentional connotations that must be considered carefully include gender, body language, color usage, stereotypes, power dynamics, and the general composition of the representation itself (in which environment should the represented entity be depicted? From what perspective should it be depicted?) (see also Kress/ van Leeuwen 2021/1996 for the notion of *social semiotic*). Additionally, cultural connotations related to clothing, styling, architecture, religious and historical (national) symbols, myths, etc. must be considered too.

From a practical point of view, one of the issues is keeping the visual elements up to date.[11] This issue encompasses not only contemporary entities that may get out of date, such as floppy disks in the 1990s and USB sticks in the present, but also entities that have undergone redesign while maintaining the same function, such as sports equipment like the vault in artistic gymnastics. Additionally, even ostensive aids paired with seemingly stable concepts may become outdated in terms of quality, fashion of representation, or photography techniques.

Another factor is a change in the perception of depicted entities. What is currently perceived as neutral can potentially evolve over time, acquiring controversial connotations. When incorporating visual elements into a lexicographic resource, it is essential to have a systematic plan for dealing with the inevitable development over time. This aspect can be time- and resource-consuming for lexicographers until it is fully automated. The potential benefits of incorporating AI for the automation of specific tasks should be considered; however, a human review of the output will always be necessary to ensure accuracy and reliability.

A further practical problem is related to the position of visual elements within the microstructure of the entries. To facilitate contrastive comparisons and better understand the relations between words belonging to the same semantic field, cross-references to visual elements associated with similar or synonymic words should be provided. As illustrated in the case of WATERCOURSE, visualizing the differences between the different watercourses is crucial, making the display of their contrasts and relations indispensable.

In this section, I have outlined the issues related to the integration of visual elements in electronic lexicographic resources. The range of visual elements

11| It should be noted that definitions are also affected by this issue, since the prototype may shift with age.

currently available has certain advantages and disadvantages that must be considered when selecting the most appropriate visual aid for a given lexeme. Dealing with lexemes in isolation generates further issues related to polysemy. It is challenging to pair, for example, a verb with a single visual element that encompasses all its polysemous senses. In order to enhance word meaning disambiguation, it is preferable to deal with words in their contextual patterns of normal usage—an approach which has been concretized in the design of the PAD.

5. Delineating conditions and a methodology

In this section, I outline the conditions and a preliminary methodology for systematically integrating ostensive aids into lexicographic resources, with the aim of determining when a lexical unit (LU) should be paired with a visual element to enhance word meaning disambiguation.

The purpose of delineating the conditions and a preliminary methodology for systematically integrating ostensive aids is to determine the cases in which a lexical unit should be accompanied by a visual element such as those listed in Table 2 (p. 164–165). These conditions stem from the work on the data of the PAD model, and the methodology is currently being tested in this framework. The goal is to finalize a comprehensive model that incorporates ostensive aids augmenting word meaning disambiguation.

A first utility criterion can be derived from the question of when to pair a LU with a visual element:

I. The visual element should be relevant for word meaning disambiguation, i.e. the visual element actually conveys *additional* (pragmatic) information—not contained in the definition—that is *necessary* for word meaning disambiguation.

This criterion can be fulfilled if one of the following conditions is met:

a) If a concrete entity must be recognizable in the outside world.

   Examples: symbols, logos, emblems, signs, gestures, tools, instruments, styles. In this case the visual element is more referential than a verbal description.

b) If cultural elements are being defined and these are representable (religious beliefs are better described: e.g. *nirvana*, *karma*).

   Examples: food, clothes, gestures, living spaces, means of transport, special tools, festive occasions, rituals (representable with videos), traditions (representable with videos), political and educational systems (representable with diagrams).

c) If verbal descriptions hardly succeed at conveying a full and precise representation of the meaning.

Examples: the definition/description of troponyms is not as effective as an ostensive representation (Giacomini et al. 2022 illustrate the LU *somebody staggers around/in a certain direction* with a video); or, more generally, movement verbs are better understood if the manner of the execution is visually demonstrated, such as in the case of *somebody nudges somebody else*.

d) If the definition defines a prototype but does not contain optional attributes that convey important information of some kind (e.g. cultural connotation).

Example (following Dobrovoľskij/ Piirainen 2022/2005: 241, mentioning the different connotational value of HOUSE): The prototype of *casa popolare* in Italy is architecturally different from the one of *Sozialwohnung* in Austria (EN 'council house'), even though they fulfil the same function.[12,13] The architectural aspect is not mentioned in the definition, but it can be delivered through an illustration.



Figure 3: Prototype of IT *casa popolare*



Figure 4: Prototype of AT *Sozialwohnung*

e) If a meaning is distributed across several lexemes within a given semantic field, these lexemes being similar, but differing from each other through language-specific sememes.

Examples: the lexemes belonging to the semantic field of WATERCOURSES analyzed in Section 3; or the semantic differences of *cookie* and *biscuit* in BE and AE (not mirrored in other languages, e.g. Italian and German, not distinctive); or the semantic distribution of *Kern* (EN '*seed* as a reproductive function') and *Same* (EN '*seed* a structural aspect [of an object]') which is different in EN and IT, where this distinction is not lexicalized (e.g. DE *Kürbiskerne* is in EN *pumpkin seeds* and in IT *semi di zucca*; DE *Sesamsamen* is in EN *sesame seeds* and in IT *semi di sesamo*).

12| © https://commons.wikimedia.org/wiki/File:Casa_popolare.JPG (accessed: 22.04.2026).

13| © https://de.wikipedia.org/wiki/Gemeindebau#/media/Datei:Karl-Marx-Hof_2009.jpg (accessed: 22.04.2026).

f) If encyclopedic information has a distinctive function in word meaning disambiguation.

Example: EN *to chop onions* and *to chop wood* are two actions carried out by different means, in the first case with a knife, in the second, with an axe. In Italian, the tool marks a semantic difference, that is, in Italian the verb is different: IT *tagliare le cipolle* (with a knife) and *spaccare la legna* (with an axe). If you say, IT *tagliare la legna* (EN 'to cut wood'), you mean that you are using a saw or an axe. If you say IT *fare la legna* (EN 'to make wood'), you refer to the activity in general to collect and prepare wood for the winter time or for heating.

g) If a LU contains an entity that is involved in an interaction with the environment or other entities (cf. Boas 2013 on the employment of frames for translation).

Example: the descriptions of roles in given settings can be best exemplified by illustrated frames/scenes (e.g. doctor/patient in a hospital).

h) If the LU is an idiomatic expression that needs to be contextualized (pragmatic indications regarding the purpose of uttering the expression in a given context must be exemplified).

Example: EN *the time is ripe* means that it is a suitable point for a particular activity (CALDo 2025: *the time is ripe*). When uttering this expression, you implicitly encourage someone to take action (this is your intention). A brief video showing a typical chat between two people in which the expression is used helps to contextualize it concretely.

This list of conditions may be extended or modified through further research. Two important specifications concerning all conditions listed above are that:

- Each ostensive aid should be accompanied by a caption (in case of pictures/illustrations, arrows should be added to guide interpretation, if necessary)
- If pictures/photos are meant to represent a prototype, this should be explicitly stated, as the picture will have a symbolic value only.

6. Conclusion

In this article, I have explored the integration of visual aids into electronic lexicographic resources, particularly focusing on their role in enhancing word meaning disambiguation so as to be helpful during translation and language learning. Visual elements, such as pictures/photographs, illustrations, and videos, offer substantial potential for enriching the understanding of entries in a dictionary, but their integration has not been approached systemically yet (as the analysis carried out in Section 4 has shown). The visual aids must be

relevant, purposeful, and contextually appropriate to convey meaningful and pragmatic information that is not easily encapsulated through verbal definitions alone. In Section 5, I have delineated several conditions for the systematic integration of visual aids with respect to the PAD model, a new learner's dictionary grounded in phraseological and cognitive principles (cf. Giacomini 2025; DiMuccio-Failla 2025).

A nuanced understanding of the relationship between words and their contextual use allows for more effective and accurate lexical resources that are sensitive to language-specific nuances, especially when dealing with semantic fields like the one of WATERCOURSE, where distinctions are important for accurate translation and understanding.

Moving forward, the research will continue testing these principles within the PAD model, ultimately contributing to the development of an integrated system. The inclusion of visual aids is not just a technical enhancement, but a step towards creating a more intuitive, culturally aware, and user-friendly approach to modern lexicographic practices.

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