Users Take Shortcuts: Navigating Dictionary Entries

Robert Lew
Adam Mickiewicz University, Poznan, Poland

In the present paper we compare the effectiveness of two alternative meaning access facilitators in a monolingual learner's dictionary: a Menu system, placed at the top of a monolingual entry; and a Shortcuts system, where the cues are distributed throughout the entry. We test the two entry formats on 90 Polish learners of English at two CEFR levels, A2 and B1. The task which triggers dictionary consultation is guided translation from English to Polish. Three outcome measures are evaluated: access time to sense, accuracy of sense selection, and translation accuracy. While Menus and Shortcuts turned up no difference in terms of consultation speed, the task success was significantly better in the Shortcuts condition. Sense selection accuracy was also better, though not significanly so, for the Shortcuts. The overall conclusion of our study is that Shortcuts are more user-friendly than Menus, although this may also depend on the form of the cues and the medium of presentation.

1. Background

Finding the relevant sense within an entry is one of the more challenging aspects of the dictionary lookup process. Particularly insidious is the tendency of dictionary users to only examine the initial senses in an entry and stop before they get to the really relevant parts (Tono 1984; Bogaards 1998; Lew 2004). It has been argued that such bad strategy might be counteracted by well-designed access facilitating devices, which would assist the dictionary user in navigating to the relevant sense, especially in the longer and more polysemous entries. Devices of this type are now to be found in a number of dictionaries, the best known being the major monolingual dictionaries for learners of English, but they are also featured in the *Encarta World English Dictionary* (Soukhanov 1999) as well as some bilingual dictionaries, notably those produced in France and Japan.

The two major systems currently in competition appear to be the menu system and the signpost system. In the former, guiding words and phrases are gathered in a single block above the entry proper. In the latter, cues (known variously, depending on the publisher, as shortcuts, signposts, guide words, or mini-definitions) are distributed throughout the entry, introducing the respective senses within it.

Previous studies (Tono 1984, 1992, 1997, 2001; Bogaards 1998; Lew and Pajkowska 2007) have yielded findings of two types. First, they have provided hard evidence that access facilitating devices are indeed helpful (at least at some levels and types of entry). Second, they have detected some differences between individual dictionaries. But the efficiency of access facilitating devices is a complex function of at least the actual cue words selected, details of layout including the specific typographic solutions adopted (Luna 2004), and the content and arrangement of senses. With such a complex interplay of factors, examining existing dictionary entries may allow the assessment of these particular products, but it does not always lead to reliable generalizations which could be applied to the design of new, improved dictionaries.

2. The study

Given the limitations of previous research, in this study we tried to verify whether menus or shortcuts perform better with respect to facilitating access to the relevant senses, and, in consequence, in assisting L2 → L1 translation. To this end, we measured three dependent variables:

1. Access time to the target sense (as selected by the subject)
2. Sense selection accuracy
3. Translation accuracy

Measure 1. above addresses the issue of access speed; but efficient use of a dictionary is not just about speed, but also about getting to the relevant information, and so we also undertook to check in what cases the appropriate sense was accessed (2.). Finally, dictionary consultation is often not an end in itself, but it assists in another activity; in this case, the activity was English-Polish (L2 → L1) translation, and our third measure addressed the quality of the translation done with the help of the dictionary entry.

In order to achieve the goals of the study, we designed a task which was partially modeled on Lew and Pajkowska (2007). The participants were 90 Polish high school students (aged between 16 and 19 years) from two institutions representing the third tier of the Polish educational system, the previous two being six years of primary school and three years in *gimnazjum*. Based on information from their teachers, we assigned all subjects to two proficiency groups: Low (A2 according to the *Common European Framework of Reference for Languages*; N=63) and High (*CEFR* B1; N=27), in an attempt to account in our analysis for some part of the variation due to proficiency level.

Participants were asked to complete guided sentence translation tasks consisting of six items.[1] Each sentence to be translated was printed on a separate A4 sheet, where it was followed by a partial Polish translation (see Appendix 1 and 2). The gap in the translation reflected a lexical difficulty involving a less common sense of a highly polysemous English word. Each item was accompanied by instructions in Polish and a complete dictionary entry (covering all parts of speech) for the problematic word. Two versions of entries were used, resulting in two experimental conditions. Roughly half the participants (N=44) worked with unmodified entries[2] taken from the Seventh Edition of the *Oxford Advanced Learners' Dictionary* (Wehmeier 2005). The original entries employ entry *Shortcuts*, a signpost-like system of distributed cues positioned at the beginning of each sense (Appendix 1). For the other half (N=46), entries were modified by converting the original Shortcuts into entry-initial menus (Appendix 2). In the process, the wording of the verbal cues was retained, so the only difference between the two conditions was the placement of the sense-guiding elements within the dictionary entries. Both versions were bound into A4-size booklets and distributed randomly to experimental subjects.

Participants worked in pairs. Within each pair, one student worked through the task, while the other student (seated so they were not able to see the task sheets) timed their partner with an electronic stopwatch, who completed a special recording sheet at moments signaled by the test-taker, that is at the beginning and end of each individual search, as instructed in writing on each individual page of the task. This procedure was also explained verbally with a short training run prior to the experiment proper. In addition, students doing the translation task were instructed to underline the relevant information in each entry; the underlining allowed us to identify the senses selected. When this stage was completed, all booklets and timing sheets were collected, and the participants switched roles within their pairs: now the first student

[1] I wish to thank my student assistant, Karolina Kubiak, for administering the task and helping with data input.

[2] The entries were the following: ADVANCE, BLOW, CLASH, DRAW, FINE, LEAD.

noted down the times, while the second student completed the task, and the procedure was repeated.

3. Results and discussion

The three measures (sense access time, sense selection accuracy, and translation accuracy) were analyzed by factorial ANOVA, with entry type (menus versus shortcuts) and proficiency level (low versus high) as independent between-subjects variables. Results for the three measures will be discussed in turn below.

4. Sense access time

Sense access time was recorded for each item and each subject in the recording sheets. Mean sense access times per item turned out to be 73.26 seconds in the Menus group and 72.49 seconds in the Shortcuts group (see Table 1). Thus, the difference was very small — less than 1 percent — and not significant (see ANOVA details in Table 3).

Entry type	N	Mean	Std.Dev.
Menus	46	73.26	27.33
Shortcuts	44	72.49	35.35

Table 1. Mean access times to senses for Menus and Shortcuts

The difference between means for the two proficiency levels was more pronounced, and the direction of the difference was somewhat surprising: 78.4 seconds for High proficiency, a mean time 11 percent longer than the 70.5 seconds for Low proficiency (see Table 2).

Proficiency	N	Mean	Std.Dev.
Low	63	70.54	31.89
High	27	78.36	29.83

Table 2. Mean access times to senses for the two Proficiency levels

However, the difference in mean access time between the two proficiency level was not significant, either. (see the Proficiency row in Table 3, where the complete results of the ANOVA are given).

DV: Time	df	SS	MS	F	p
Intercept	1	413768.9	413768.9	413.82	0.00
Proficiency	1	1071.8	1071.8	1.07	0.30
Version	1	53.0	53.0	0.05	0.82
Proficiency*Version	1	199.4	199.4	0.20	0.66
Error	86	85989.2	999.9		
Total	89	87349.0			

Table 3. ANOVA table on sense access time by entry Version and Proficiency level

5. Sense selection accuracy

Sense selection accuracy was computed as the ratio of correctly identified senses per total number of items. For each item, there was exactly one appropriate entry sense relevant to the sentence context, and a sense was counted as correctly identified if the student's underlining coincided with this relevant sense. By this measure, the difference between Menus and

Shortcuts turns out to be more interesting than for access time: Shortcuts users identified correctly 29.2% of their senses on average, that is as much as 15% higher than subjects using Menus (with an accuracy of 25.4%; see Table 4).

Entry type	N	Mean	Std.Dev.
Menus	46	25.4%	17.5%
Shortcuts	44	29.2%	24.4%

Table 4. Sense selection accuracy for Menus and Shortcuts

The difference, though sizeable, did not turn out to be statistically significant, as evidenced in the Version row of the relevant ANOVA table (Table 5). Nevertheless, the observed tendency may suggest a possible advantage of the Shortcuts version with respect to guiding the users to the right sense, which may have failed to reach statistical significance due to large individual variation (cf. the standard deviation figures in Table 4).

DV: Sense selection accuracy	df	SS	MS	F	p
Intercept	1	6.03	6.03	134.52	0.00
Proficiency	1	0.05	0.05	1.01	0.32
Version	1	0.07	0.07	1.47	0.23
Proficiency*Version	1	0.04	0.04	0.90	0.35
Error	86	3.86	0.04		
Total	89	3.97			

Table 5. ANOVA table on sense selection accuracy by entry Version and Proficiency level

With regard to the Proficiency dimension, the mean accuracy in the High proficiency group turned out to be higher by 11% than in the Low proficiency group, an unsurprising, though not significant, difference.

6. Translation accuracy

Our third and final measure targeted the success in the translation task which prompted the dictionary consultation in the first place. An item was counted as correctly translated if the resulting translation was lexically appropriate. Here again, just as for sense selection accuracy, it was the Shortcuts group which outperformed the Menu version users, with accuracy rates of 50.4% and 45.3%, respectively (see Table 6).

Entry type	N	Mean	Std.Dev.
Menus	46	45.3%	17.8%
Shortcuts	44	50.4%	21.4%

Table 6. Translation accuracy for Menus and Shortcuts

In this case the difference between the two entry versions turned out to be statistically significant by ANOVA ($p=0.04$, see Table 7). In view of the translation accuracy rate being 11% higher for the Shortcuts condition, this finding provides relevant evidence in favour of Shortcuts, which here resulted in more satisfactory translations. In this context, the difference in sense selection accuracy, identical in magnitude though not itself statistically significant, would reasonably account for the improved translation scores.

DV: Translation accuracy	df	SS	MS	F	p
Intercept	1	18.83	18.83	523.66	0.00
Proficiency	1	0.20	0.20	5.54	0.02*
Version	1	0.15	0.15	4.18	0.04*
Proficiency*Version	1	0.13	0.13	3.56	0.06
Error	86	3.09	0.04		
Total	89	3.46			

Table 7. ANOVA table on translation accuracy by entry Version and Proficiency level

At the same time, High proficiency students performed better in terms of translation accuracy than Low proficiency subjects by nearly 21%, which was to be expected, and this difference is significant. Note that, overall, the translation accuracy rate is higher than the sense selection accuracy. This means that there were cases of students coming up with correct translations without hitting on the optimal sense within the entry. This could be achieved by subjects drawing on any combination of the following resources to work out a solution: a different but sufficiently related sense within the entry; the context of the translation; and their own lexical competence.

7. Discussion and conclusions

Our study provides the first empirical evidence on the relative effectiveness of two modern access facilitating devices currently in competition: Shortcuts, in which disambiguating cues introduce the individual senses within the entry, and Menus, where such cues are gathered in a single block of text and placed at the top of the entry proper.

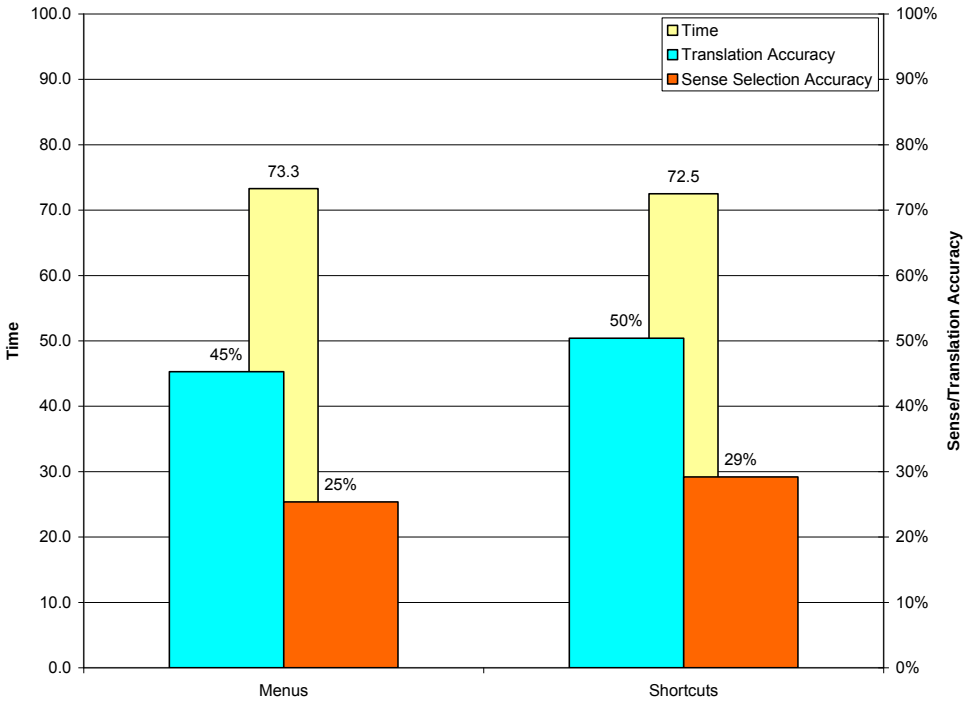

Figure 1. Mean sense access time, sense selection accuracy and translation accuracy for the Menus and Shortcuts versions

Our findings (see Figure 1 for a graphical summary of all three measures used) indicate the two systems to be practically equivalent when it comes to speed of access. However, Shortcuts-equipped entries lead to significantly better translations, and the accuracy with which Shortcuts users identified the relevant senses was 15% higher (though not significantly so) than for those

using Menus. These findings point to an advantage of Shortcuts, a distributed cues system (also know as Guidewords or Signposts), over a single entry-initial Menu.

Where could this advantage be coming from? There are three factors that could explain (post-hoc, and somewhat speculatively) the superiority of Shortcuts. First, even if the correct sense is identified in the Menu itself, the user may become lost when moving from the Menu item to the sense. This danger appears to be less likely with the cues being placed next to the full treatment at a given sense. Second, if the cues are located closer to their full senses, the user may be better able to integrate them with the complete content of the dictionary article, checking when needed further details in the sense in those cases where the Shortcuts themselves do not provide sufficient, unambiguous guidance for a particular user. Third, the content of the Shortcuts may at times usefully supplement the data found under its sense, and can assist in the processing and assimilating the lexicographic data in this part of the entry. However, if the same cues are positioned at the top of the entry as part of a Menu, it is less likely that the user will go back and try to integrate the shorthand information with the full treatment under its corresponding sense.

8. Suggestions for further study

It is not just the positioning of the guiding cues relative to the structural elements of an entry, but also the form of the cues that is likely to have an impact on their use and usability. For example, the sense of the English verb *drive* as in *drive a car* is signposted in *ALD7* with just the single word VEHICLE. The same sense in the second edition of the *Macmillan English Dictionary* (Rundell 2007) is given the more elaborate, though still telegraphic CONTROL VEHICLE, while *EWED* has CONTROL MOVEMENT OF VEHICLE. We might note that the latter two cues are glosses in the form of skeletal verb phrases[3] (with article omission being an instance of lexicographic textual condensation, cf. Wiegand 1996; Svensén 2009: 82-92), and thus roughly syntactically substitutable for the headword verb, while the *ALD7* goes for a noun collocate of the head verb[4]. It is conceivable that one of these forms is more suitable for Menus, while the other one — for Shortcuts. This is a question that could form the topic of a future study.

The above discussion refers to the *verbal* form of the cues, i.e. the language used, but one should also pay attention to the *visual* form of the cues, i.e. their formatting and typography. Unfortunately, the typographic aspect of the presentation of lexicographic data has received very little attention in the lexicographic literature (but see Luna 2004).

Another significant issue is the role of the medium of presentation. Paper has until recently been the traditional form of dictionaries, but this is now rapidly changing. And, since access mechanism is one of those areas where electronic dictionaries are likely to differ most from their paper counterparts (De Schryver 2003), results of studies with paper form may not neccessarily by directly applicable to electronic interfaces. For example, it is possible on screen, but not on paper, to highlight the entry sense which the user has selected from the menu. A recent study (Lew and Tokarek 2010) demonstrates this to be a very effective technique when

[3] The omission of articles in these formulas is a consequence of lexicographic textual condensation (cf. Wiegand 1996; Svensén 2009: 82-92).

[4] On top of being an actual collocate of the verb *drive*, the noun *vehicle* is also a superordinate representative of a class of frequent collocates (such as *car*, *SUV*, etc.), also termed a *context categorizer* (Svensén 2009: 264).

compared with the entry menu alone. Clearly, there is a need to study and compare the effectiveness of the various new access mechanisms afforded by the electronic dictionary format.

Bibliography

Bogaards, Paul. (1998). 'Scanning Long Entries in Learner's Dictionaries'. In Thierry Fontenelle, Philippe Hiligsmann, Archibal Michiels, André Moulin and Siegfried Theissen (eds.), *Euralex '98 Actes/Proceedings*. Liege: Université Départements d'Anglais et de Néerlandais. 555-563.

De Schryver, Gilles-Maurice. (2003). 'Lexicographers' Dreams in the Electronic-Dictionary Age.' In *International Journal of Lexicography* 16.2. 143-199.

Lew, Robert. (2004). *Which Dictionary for Whom? Receptive Use of Bilingual, Monolingual and Semi-Bilingual Dictionaries by Polish Learners of English*. Poznań: Motivex.

Lew, Robert and Pajkowska, Julita. (2007). 'The Effect of Signposts on Access Speed and Lookup Task Success in Long and Short Entries.' In *Horizontes de Lingüística Aplicada* 6.2. 235-252.

Lew, Robert and Tokarek, Patryk. (2010). 'Entry Menus in Bilingual Electronic Dictionaries'. In Sylviane Granger and Magali Paquot (eds.), *Elexicography in the 21st Century: New Challenges, New Applications*. Louvain-la-Neuve: Cahiers du CENTAL.

Luna, Paul. (2004). 'Not Just a Pretty Face: The Contribution of Typography to Lexicography'. In Geoffrey Williams and Sandra Vessier (eds.), *Proceedings of the Eleventh Euralex International Congress, Euralex 2004, Lorient, France, July 6-10, 2004*, Vol.2. Lorient: Université De Bretagne Sud. 847-858.

Rundell, Michael (ed.; 2007). *Macmillan English Dictionary*. London: Macmillan. (MED2)

Soukhanov, Anne (ed.; 1999). *Encarta World English Dictionary*. New York: St. Martin's Press. (EWED)

Svensén, Bo. (2009). *A Handbook of Lexicography: The Theory and Practice of Dictionary-Making*. Cambridge: Cambridge University Press.

Tono, Yukio. (1984). *On the Dictionary User's Reference Skills*. B.Ed. Thesis, Tokyo Gakugei University, Tokyo.

Tono, Yukio. (1992). 'The Effect of Menus on EFL Learners' Look-up Processes.' In *Lexikos* 2. 230-253.

Tono, Yukio. (1997). 'Guide Word or Signpost? An Experimental Study on the Effect of Meaning Access Indexes in EFL Learners' Dictionaries.' In *English Studies* 28. 55-77.

Tono, Yukio. (2001). *Research on Dictionary Use in the Context of Foreign Language Learning: Focus on Reading Comprehension*. (Lexicographica Series Maior 106.). Tübingen: Niemeyer.

Wehmeier, Sally (ed.; 2005). *Oxford Advanced Learner's Dictionary of Current English*, 7th edition. Oxford: Oxford University Press. (ALD7)

Wiegand, Herbert Ernst. (1996). 'Textual Condensation in Printed Dictionaries. A Theoretical Draft.' In *Lexikos* 6. 133-158.

Appendix 1: Sample task sheet: the Shortcuts version (English translation of the instructions was not supplied in the study)

Dokończ tłumaczenie zdania na język polski korzystając z załączonego hasła słownikowego. Rozpoczynając i kończąc zadanie podnieś rękę. Podkreśl część hasła użytą do przetłumaczenia wyrażenia.
[Complete the translation of the sentence into Polish referring to the dictionary entry supplied below. Always raise your hand at the start and finish of each item. Underline the parts of the entry you use.]

The date of the wedding will have to be advanced by two days.

Datę ślubu trzeba będzie _____o 2 dni.

ADVANCE noun, verb, adjective
■ **noun**
FORWARD MOVEMENT 1 [C] the forward movement of a group of people, especially armed forces: *We feared that an advance on the capital would soon follow.*
DEVELOPMENT 2 [C, U] advance (in sth) progress or a development in a particular activity or area of understanding:recent advances in medical science · *We live in an age of rapid technological advance.*
MONEY 3 [C, usually sing.]money paid for work before it has been done or money paid earlier than expected*: They offered an advance of £5 000 after the signing of the contract.* · *She asked for an advance on her salary.*
SEXUAL 4 advances [pl.] attempts to start a sexual relationship with sb: *He had made advances to one of his students.*
PRICE INCREASE 5 [C] advance (on sth) (business) an increase in the price or value of sth: *Share prices showed significant advances.*
IDM in advance (of sth)
1 before the time that is expected; before sth happens*: a week / month / year in advance It's cheaper if you book the tickets in advance.* · *People were evacuated from the coastal regions in advance of the hurricane.*
2 more developed than sb/sth else: *Galileo's ideas were well in advance of the age in which he lived.*
■ **verb**
MOVE FORWARD 1 [v] advance (on / towards sb/sth) to move forward towards sb/sth, often in order to attack or threaten them or it: *The mob advanced on us, shouting angrily.* · *The troops were finally given the order to advance.* · *They had advanced 20 miles by nightfall.* · *The advancing Allied troops*—compare RETREAT

DEVELOP 2 if knowledge, technology, etc. advances, it develops and improves: [v] *Our knowledge of the disease has advanced considerably over recent years.* [vn] *This research has done much to advance our understanding of language learning.*

HELP TO SUCCEED 3 [vn] to help sth to succeed SYN further: *Studying for new qualifications is one way of advancing your career.* · *They worked together to advance the cause of democracy.*

MONEY 4 advance sth (to sb) | advance (sb) sth to give sb money before the time it would usually be paid: [vn, vnn] *We are willing to advance the money to you. We will advance you the money.*

SUGGEST 5 [vn] (formal) to suggest an idea, a theory, or a plan for other people to discuss SYN put forward*: The article advances a new theory to explain changes in the climate.*

MAKE EARLIER 6 [vn] (formal) to change the time or date of an event so that it takes place earlier SYN bring forward: *The date of the trial has been advanced by one week.* OPP *postpone*

MOVE FORWARD 7 (formal) to move forward to a later part of sth; to move sth forward to a later part: [v] *Users advance through the program by answering a series of questions. [vn] This button advances the tape to the beginning of the next track.*

INCREASE 8 [v] (business) (of prices, costs, etc.) to increase in price or amount: *Oil shares advanced amid economic recovery hopes.*

■ **adjective**

[only before noun] **1** done or given before sth is going to happen: *Please give us **advance warning** of any changes.* · *We need **advance notice** of the numbers involved.* · *No **advance booking** is necessary on most departures* .**2 advance party / team** a group of people who go somewhere first, before the main group

Rozpoczynając i kończąc zadanie podnieś rękę.
Podkreśl część hasła użytą do przetłumaczenia wyrażenia.
[Always raise your hand at the start and finish of each item.
Underline the parts of the entry you use.]

Appendix 2: Sample task sheet: the Menu version (English translation of the instructions was not supplied in the study)

Dokończ tłumaczenie zdania na język polski korzystając z załączonego hasła słownikowego. Rozpoczynając i kończąc zadanie podnieś rękę. Podkreśl część hasła użytą do przetłumaczenia wyrażenia.
[Complete the translation of the sentence into Polish referring to the dictionary entry supplied below. Always raise your hand at the start and finish of each item. Underline the parts of the entry you use.]

The date of the wedding will have to be advanced by two days.

Datę ślubu trzeba będzie _____ o 2 dni.

ADVANCE noun, verb, adjective
1. FORWARD MOVEMENT 2. DEVELOPMENT 3. MONEY 4. SEXUAL 5. PRICE INCREASE 6. MOVE FORWARD 7. DEVELOP 8. HELP TO SUCCEED 9. MONEY 10. SUGGEST 11. MAKE EARLIER 12. MOVE FORWARD 13. INCREASE
■ **noun**
1 [C] the forward movement of a group of people, especially armed forces: *We feared that an advance on the capital would soon follow.*
2 [C, U] advance (in sth) progress or a development in a particular activity or area of understanding:recent advances in medical science *We live in an age of rapid technological advance.*
3 [C, usually sing.] money paid for work before it has been done or money paid earlier than expected*: They offered an advance of £5 000 after the signing of the contract.* · *She asked for an advance on her salary.*
4 advances [pl.] attempts to start a sexual relationship with sb: *He had made advances to one of his students.*
5 [C] advance (on sth) (business) an increase in the price or value of sth: Share prices showed significant advances.
IDM in advance (of sth)
1 before the time that is expected; before sth happens*: a week / month / year in advance It's cheaper if you book the tickets in advance.* · *People were evacuated from the coastal regions in advance of the hurricane.*
2 more developed than sb/sth else: *Galileo's ideas were well in advance of the age in which he lived.*
■ **verb**
6 [v] advance (on / towards sb/sth) to move forward towards sb/sth, often in order to attack or threaten them or it: The mob advanced on us, shouting angrily. *The troops were finally given the order to advance.* · *They had advanced 20 miles by nightfall.*· *the advancing Allied troops* — compare RETREAT

7 if knowledge, technology, etc. advances, it develops and improves: [v] *Our knowledge of the disease has advanced considerably over recent years.* · [vn] *This research has done much to advance our understanding of language learning.*
8 [vn] to help sth to succeed SYN further: *Studying for new qualifications is one way of advancing your career.* · *They worked together to advance the cause of democracy.*
9 advance sth (to sb) | advance (sb) sth to give sb money before the time it would usually be paid: [vn, vnn] *We are willing to advance the money to you.* · *We will advance you the money.*
10 [vn] (formal) to suggest an idea, a theory, or a plan for other people to discuss SYN put forward*:* *The article advances a new theory to explain changes in the climate.*
11 [vn] (formal) to change the time or date of an event so that it takes place earlier SYN bring forward: *The date of the trial has been advanced by one week.* *OPP* *postpone*
12 (formal) to move forward to a later part of sth; to move sth forward to a later part: [v] *Users advance through the program by answering a series of questions.* [vn] *This button advances the tape to the beginning of the next track.*
13 [v] (business) (of prices, costs, etc.) to increase in price or amount: *Oil shares advanced amid economic recovery hopes.*
■ **adjective** [only before noun] **1** done or given before sth is going to happen: *Please give us* ***advance warning*** *of any changes.* · *We need* ***advance notice*** *of the numbers involved.* · *No* ***advance booking*** *is necessary on most departures.* **2 advance party / team** a group of people who go somewhere first, before the main group

Rozpoczynając i kończąc zadanie podnieś rękę.
Podkreśl część hasła użytą do przetłumaczenia wyrażenia.
[Always raise your hand at the start and finish of each item.
Underline the parts of the entry you use.