

***Use PC-PATR with FLE_x* User Documentation**

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Contents

1	Introduction	2
1.1	Installation	2
1.2	Invoking <i>Use PC-PATR with FLE_x</i> from within <i>FLE_x</i>	2
1.3	Initial invocation	2
1.4	Appearance	3
2	Buttons	3
2.1	PC-PATR grammar Browse button	3
2.2	Rootgloss choices	3
2.3	Advanced	4
2.4	Help button	4
2.5	Refresh texts button	4
2.6	Disambiguate button	5
2.7	Parse button	5
3	Parsing a segment	5
4	Disambiguating a text	5
5	Restarting <i>Use PC-PATR with FLE_x</i>	6
6	Error messages	6
7	Known problems	8
8	Support	9
A.	The <i>PcPatr Browser</i> tool	9
A.1	Overview	9
A.2	Right-to-left script	11
A.3	Keyboard shortcuts	11
B.	Another way to edit a PC-PATR grammar file	12

1 Introduction

Use PC-PATR with FLE_x is a tool that works as a utility in *FieldWorks Language Explorer* (aka *FLE_x*). *Use PC-PATR with FLE_x* can use a PC-PATR grammar to disambiguate a text or a portion of a text that has been analyzed in a *FLE_x* project. You tell *Use PC-PATR with FLE_x* the PC-PATR grammar file to use. Then you can choose a text or a portion of that text and ask *Use PC-PATR with FLE_x* to try and disambiguate it.

Use PC-PATR with FLE_x works with version 9.1.14 Beta or higher of *FLE_x* and is only available on 64-bit Windows computers.

While you can use any PC-PATR grammar file, *Use PC-PATR with FLE_x* expects that you will have used the *PAWS* program to create the PC-PATR grammar file. See <https://software.sil.org/paws/> for more on *PAWS*.

1.1 Installation

To install *Use PC-PATR with FLE_x*, obtain the installer from <https://github.com/sillsdev/pcpatrflex/tree/master/Installer/Output/UsePcPatrWithFLExDllSetup.exe>. The installer will check to see if you have installed *FieldWorks Language Explorer* version 9. If not, it will abort.

We recommend that you close *FieldWorks Language Explorer* before running the *Use PC-PATR with FLE_x* installer.

1.2 Invoking *Use PC-PATR with FLE_x* from within *FLE_x*

While running *FLE_x*, use **Tools** menu item / **Utilities....** Find the “Use PC-PATR with FLE_x” item, check it, and then click on the “Run Checked Utilities Now” button.

1.3 Initial invocation

The first time you invoke *Use PC-PATR with FLE_x* on a *FLE_x* database, it will automatically add to your *FLE_x* database the following:

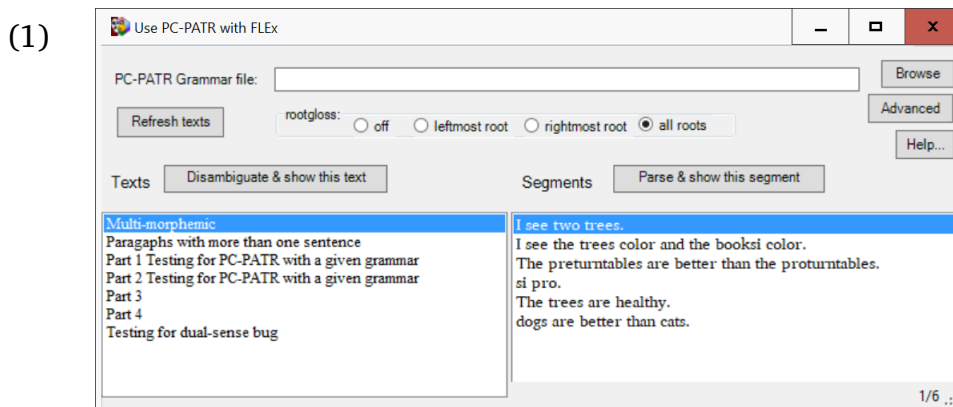
1. a custom field to each sense (called “PCPATR”) and
2. a custom list (called “PCPATR Feature Descriptors”) containing the template names that the PC-PATR grammar generated by the *PAWS* program expects.

The names shown above are always in the English analysis writing system and English is the only writing system containing these names.

You can find the custom list by clicking on the “Lists” button in *FLE_x*.

1.4 Appearance

Use PC-PATR with FLE_x looks like what is shown in (1).



The texts in the *FLE_x* database are shown in the left pane and the segments of the first text are shown in the right pane.

There are buttons you can click. Each is discussed in section 2 below.

2 Buttons

You control *Use PC-PATR with FLE_x* by using the various buttons. This section briefly describes them. See sections 3–4 for more on what happens for the segment and text buttons, respectively.

2.1 PC-PATR grammar Browse button

To choose which PC-PATR grammar file to use, click on the Browse button. By convention, PC-PATR grammar files have an extension of “.grm” so this is what the file browser uses.

2.2 Rootgloss choices

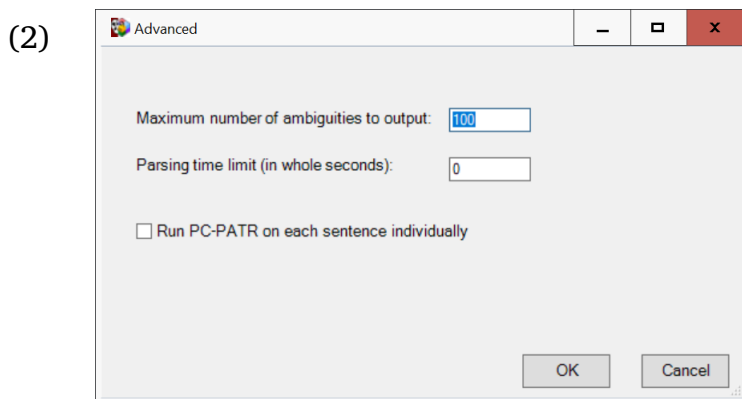
PC-PATR allows you to have “rootglosses” in rules. This section allows you to set one of four options with respect to how rootglosses are handled. See section 3.2.14.22 “set rootgloss” in the PC-PATR Reference Manual.¹ The four options are:

1. off: rootglosses are not used; this is the default;
2. leftmost root: the first / leftmost root is used;
3. rightmost root: the last / rightmost root is used;
4. all: every root is used.

¹Use the **Help** menu item / **PC-PATR Reference Manual** to see this document.

2.3 Advanced

The “Advanced” button is used to changed some advanced options. It brings up a dialog that looks like what is shown in (2).



There are three options:

1. “Maximum number of ambiguities to output:” is the maximum number of ambiguities that will appear in the *PcPatr Browser*. The default is 100.
2. “Parsing time limit:” is how many seconds to allow for parsing the segments. The default is 0 (which means no time limit).
3. “Run PC-PATR on each sentence individually” is for running each segment individually when disambiguating a text. It is most useful when using a time limit. With this option, you can have *Use PC-PATR with FLEEx* parse each segment for a maximum number of seconds given by the parsing time limit. Without this option, the maximum time limit is for the entire text. With this option, the maximum time limit is for each segment.

Use PC-PATR with FLEEx will remember the settings for each of these three options when you close *Use PC-PATR with FLEEx*.

2.4 Help button

The “Help...” button is used to get this user documentation file, show the PC-PATR Reference Manual, or to show the “About” dialog box.

2.5 Refresh texts button

Whenever you click on the “Refresh texts” button, *Use PC-PATR with FLEEx* will reload all of the texts from *FLEEx*. This is so if you know that if some texts have been added, deleted or changed since you first started *Use PC-PATR with FLEEx*, you can get the most current list of texts.

2.6 Disambiguate button


Above the pane containing the texts is a button labeled “Disambiguate & show this text.” You use this button to try and use the PC-PATR grammar to disambiguate this entire text. See section 4 for more.


2.7 Parse button

Above the pane containing the segments of the selected text is a button labeled “Parse & show this segment.” You use this button to try and use the PC-PATR grammar to parse this particular segment. See section 3 for more.

3 Parsing a segment

When you use the “Parse & show this segment” button for a segment or double click on that segment, *Use PC-PATR with FLEx* will pass the parsing information that you entered in *FLEx* to *PC-PATR*, along with the PC-PATR grammar, and process that segment. The result will be shown in a slightly newer version of the *PcPatr Browser* tool (<https://software.sil.org/carla/pc-patr-browser/>). See appendix A for more information on this tool.

You use this tool to see all the parses the *PC-PATR* program produced for this segment using the PC-PATR grammar file. When there are two or more parses, you can show the correct one and then use **Parse / Use This Parse** menu item (or click on the  tool bar button) to have this analysis be recorded in the *FLEx* database for this segment. That is, this segment will be disambiguated, using the information from this parse.

If you are using the *TreeTran* program, you can save the results of the disambiguated parses in a file called *Invoker.xml* in the %TEMP% directory. You do this by using **File / Save for TreeTran** to make sure there is a check mark before it. Alternatively, you can click on the  item in the tool bar.


When you are done looking at the results, close the *PcPatr Browser* tool and you will return to *Use PC-PATR with FLEx*.

You can also select more than one segment. When you then use the “Parse & show this segment” button, *Use PC-PATR with FLEx* will parse and show all of the selected segments.

4 Disambiguating a text

When you use the “Disambiguate & show this text” button, *Use PC-PATR with FLEx* will pass the parsing information for all segments in the text to *PC-PATR*, along with the PC-PATR grammar, and process all those segments. Since all the segments are processed, this will probably take a while. So please be patient. The result will be shown in the slightly newer version of the *PcPatr Browser* tool. See appendix A for more information on this tool.

Unlike with parsing a segment (see section 3), the result will have as many “sentences” as there are segments in the text.

By default, *Use PC-PATR with FLE_x* will disambiguate a segment in the *FLE_x* database whenever the result of the parsing uniquely identifies the analysis of each word in the segment. For those cases where there are still ambiguities, you can use the *PcPatr Browser* tool to select a given parse to use. Like with parsing a segment, you show the correct parse and then use **Parse / Use This Parse** menu item (or click on the  tool bar button) to have this analysis be recorded in the *FLE_x* database for this segment. That is, this segment will be disambiguated, using the information from this parse.

When you are done looking at the results, close the *PcPatr Browser* tool and you will return to *Use PC-PATR with FLE_x*.

5 Restarting *Use PC-PATR with FLE_x*

Whenever you exit and restart *Use PC-PATR with FLE_x*, it will do the following:

1. remember its window size, location, and layout;
2. remember which PC-PATR grammar file you last chose;
3. remember which text in that project you last selected; and
4. remember which segment in that text you last selected.²

6 Error messages

In certain situations, *Use PC-PATR with FLE_x* will issue an error message.

Table 1 lists the errors *Use PC-PATR with FLE_x* reports along with a brief description of what the error might mean.

²If you selected more than one segment, *Use PC-PATR with FLE_x* will remember the bottom-most one.

Error	Meaning
The PC-PATR grammar file had an error in it and failed to load. We will show the error log after you click on OK. Please fix all errors in the grammar file and then try again.	The PC-PATR grammar file being used has at least one error in it so the <i>PC-PATR</i> program could not load and use it. The list of errors (and any warning messages, too) will be shown as soon as you click on the OK button. Note that in the error message file, the grammar file's location may look odd, but it is the same as what is showing before the “Browse” button. ³ Also, the error messages and warnings may be a bit cryptic. See the PC-PATR Reference Manual for (some possible) help on this. (The manual is available via the “Help” button; see section 2.4.)
The following glosses contain a space. Please fix them and try again.	At least one gloss used in one of the segments has a space in it. This will produce incorrect values in some of the files used. You will continue to get this message until you find and fix the gloss. You should be able to search for the gloss in Lexicon Edit in <i>FLEX</i> .
Segment number <i>number</i> does not have any words in it. Please remove it or add words and try again.	The indicated segment number does not have any words in it. You need to either remove the segment from the text or add some words to the segment in <i>FLEX</i> .
Sorry, but not every sentence has every word parsed. At least the word ' <i>word</i> ' did not parse. Please make sure every word is parsed and try again.	The indicated word does not have a parse. You need to give that word a parse in <i>FLEX</i> .
Sorry, but at least the word ' <i>word</i> ' has an analysis with an invalid parse. Please make sure every word has valid parses and try again.	The indicated word does not have a valid parse. You need to fix it in <i>FLEX</i> .

³This happens for long file names or folder names. *PC-PATR* is a “DOS” program and uses this cryptic format.

Error	Meaning
The read failed for segment number <i>number</i> ; some error message	Something went wrong while processing the indicated segment number. This only shows when the “Run PC-PATR on each sentence individually” option is set (see section 2.3). It may be that the “Parsing time limit” was met and <i>Use PC-PATR with FLE_x</i> had some issue trying to read one of its temporary files.
The PC-PATR processing failed! Perhaps there are incompatible feature values in one of the forms. We will show the error log after you click on OK. You may also want to try and run the PcPatrFLE _x .bat file in the %TEMP% directory. This may or may not show which features are incompatible or some other PC-PATR error or warning message.	When processing the input segment, the PC-PATR grammar file being used has at least one incompatibility in it. The list of errors (and any warning messages, too) will be shown as soon as you click on the OK button. Note that in the error message file, the grammar file's location may look odd, but it is the same as what is showing before the “Browse” button. Also, the error messages and warnings may be a bit cryptic. See the PC-PATR Reference Manual for (some possible) help on this. (The manual is available via the “Help” button; see section 2.4.)

Table 1: *Error messages*

If you get an error message not in the list above, please report it. See section 8.

7 Known problems

The following items are known to be less than desirable with this version of *Use PC-PATR with FLE_x*:

1. *Use PC-PATR with FLE_x* only works with version 9.1.14 Beta or higher of *FLE_x*.
2. *Use PC-PATR with FLE_x* assumes that the comment character in the PC-PATR grammar file is a vertical bar |. If you use something else, the parser will fail every segment.
3. When a word in *FLE_x* does not have the “Word Cat” field filled out for a word in the interlinear, *Use PC-PATR with FLE_x* will try and guess what the category of the word should be. It does this as follows:
 - a. If there is only one morpheme, use its category.

- b. If there are two or more morphemes and only one stem/root, find the stem and use its category. (This could be incorrect if one of the affixes is derivational and changes the category.)
- c. If there are two or more stems, use the category of the left-most one. (This could be incorrect if some other stem is the correct category to use or if the stem compounding results in a different category or if one of the affixes is derivational and changes the category.)

Therefore, it is always a good idea to overtly fill out the “Word Cat” field in *FLEX*.

- 4. When a morpheme in a word analysis has just the form but no sense or grammatical info, then the gloss showing in the output will be the gloss of the first sense of the entry for the morpheme.
- 5. When a morpheme in a word analysis has the form and grammatical info but no sense overtly indicated and there are two or more senses using the grammatical info in the entry, then the gloss showing in the output will be the gloss of the first sense which uses the grammatical info.
- 6. The user interface is in English only.

8 Support

If you have any questions with *Use PC-PATR with FLEX* or find bugs in it, please send an email to blackhandrew@gmail.com.

A. The *PcPatr Browser* tool

This appendix briefly covers the various parts of the *PcPatr Browser* tool.

A.1 Overview

Example (3) is a screen shot of what it looks like for one segment using one PC-PATR grammar.

(3)

The screenshot shows the PC-PatRBrower application interface. At the top, the title bar reads "PcPatRBrower - C:\Users\ANDYBL-1\AppData\Local\Temp\Invoker.and (Default Language)". The menu bar includes File, View, Sentence, Parse, Language, and Help. Below the menu is a toolbar with various icons.

The main window is divided into four panes:

- Top Pane:** Displays "Sentence 1 of 1" with the sentence "we want to get married and be happy". Each word is color-coded and has a feature structure listed below it:

we	want	to	get	married	and	be	happy
1PL-nom	want	to	get-cop	marry-PART	and	be	happy
pro	v	aux	v	v	conj	v	adj
first nominative plural	sentential_-finiteIP_or_transitive	-finite	copular	participle	plural	copular	
- Middle-Left Pane:** Displays "Parse 1 of 2" with a syntactic tree. The root node is S, which branches into IP. IP branches into DP+ and I'. DP+ branches into D'+, which branches into Pron, which branches into "we". I' branches into VP, which branches into V, which branches into "want". The tree continues with Aux and another VP.
- Middle-Right Pane:** Contains a text box with the instruction: "When you click on a node in the tree shown in the panel to the left, any feature structure associated with that node will show up here. (Note: if you do not have PC-PATR include feature structures in the output, then no features will ever show here.)"
- Bottom Pane:** Displays the PC-PATR grammar file. It starts with a warning: "DO NOT EDIT THIS FILE UNTIL YOU HAVE COMPLETED THE ENTIRE STARTER KIT!". Below this, it says "PC-PATR Grammar file for PAWS Starter Kit" and "C Black July 2012". It also shows "i-Phrase structure rules" and a table with the rule "Let ablative be <head case> = ablative".

There are four panes:

1. the segment in an interlinear form (at the top);
2. the syntactic tree, if any (left, middle);
3. the feature structure of the selected node in the tree (right, middle); and
4. the PC-PATR grammar file used (bottom)

When a node in the tree is selected, the bottom pane will show the rule in the PC-PATR grammar file that produced that node. In addition, the features for that selected node will appear in the right, middle pane. For example, when clicking on the IP node, it looked like example (4).

(4)

The screenshot shows the PcPatr Browser window with the following components:

- Top Bar:** File View Sentence Parse Language Help
- Sentence 1 of 1:**

we	want	to	get	married	and	be	happy
1PL-nom	want	to	get-cop	marry-PART	and	be	happy
pro	v	aux	v	v	conj	v	adj
first nominative plural	sentential_finiteIP_or_transitive	-finite	copular	participle	plural	copular	
- Parse 1 of 2:**

```

graph TD
    S --> IP
    IP --> DP+
    IP --> I'
    DP+ --> D+
    D+ --> Pron
    Pron --> we
    we --> 1PL-nom
    I' --> V
    V --> want
    want --> want
    I' --> VP
    VP --> Aux
    Aux --> to
    to --> aux
    VP --> VP
    VP --> IP
    IP --> I'
    I' --> V
    V --> get
    get --> get-cop
    I' --> VP
    VP --> married
    married --> marry-PART
    VP --> and
    and --> conj
    VP --> be
    be --> v
    VP --> happy
    happy --> happy
  
```
- Feature Pane:**

```

[cat: IP
head: $10 [adjoinedVP: -
adverbialVP: -
embedded: $7 [cat: IP
head: $6 [adjoinedVP: -
adverbialVP: -
embedded: [cat: none]
fronted: none
infl: [finite: -
polarity: positive
valence: active
voice: none ]
subject: head: faer: 11]
  
```
- Rule Pane:**

```

rule (IP option Za - subject initial, required, active only)
IP = DP I'
<IP head> = <I' head>
<IP head type root> = <DP head type root>
<IP head type pro-drop> = -
<I' head subject> = <DP>
<I' head infl valence> = active
<DP head type focusmarked> = - | + in focus position
<DP head type prefix focusmarked> = - | + in focus position
<DP head type suffix focusmarked> = - | + in focus position
<I' head type existential> = -
<I' head type speech_PP> = +
<I' head type speech_DP> = +
<I' head type copular> = +
<I' head type perception> = +
  
```

When there is more than one segment, you can use the **Sentence** menu item options or the first set of arrow buttons on the tool bar to navigate from one sentence to another. See appendix A.3 for keyboard shortcuts. (Please note that with *Use PC-PATR with FLEx*, “sentence” is the same as “segment.”)

When there is more than one parse for a given segment, you can use the **Parse** menu item options or the second set of arrow buttons on the tool bar to navigate from one parse to another. See appendix A.3 for keyboard shortcuts.

When you manually select to use a parse, then the entire tree description will be highlighted in yellow. In addition, the sentence number in the interlinear pane will be highlighted in yellow.

A.2 Right-to-left script

If the vernacular language of your *FLEx* project is a right-to-left script, *Use PC-PATR with FLEx* will try to tell the *PcPatr Browser* this. You may need to use the **Language** menu item, though, and uncheck and then check the “Use right-to-left orientation in parse tree and interlinear” option.

A.3 Keyboard shortcuts

To make processing texts faster, there are several keyboard shortcuts available. These only work when the “focus” is in the interlinear, tree, or feature panes. When *PcPatr Browser* begins, the default is to have the “focus” on the feature pane. If you have clicked in the *PC-PATR* grammar file pane or if you are using the keyboard

to select a menu item, then these shortcuts will not work. You will need to click in the interlinear, tree, or feature pane first.

The shortcuts are as in example (5):

(5)	Shortcut	Operation
	Ctrl + Down Arrow	Next sentence
	Ctrl + Up Arrow	Previous sentence
	Ctrl + Right Arrow	Next parse
	Ctrl + Left Arrow	Previous parse
	Ctrl + Shift + Down Arrow	Use this parse & go to next sentence
	Ctrl + /⁴	Use this parse
	Ctrl + L	Use this parse

B. Another way to edit a PC-PATR grammar file

One challenge with editing a PC-PATR grammar file is that it is a plain text file. If one wants to try and debug a grammar, one has to comment off a large amount of lines. It can get to be tricky.

Some tentative work has been done on a tool that will take a PC-PATR grammar file and convert it to a form that can be used in a tool like the *XMLmind XML Editor*. Some advantages of this are that one can:

1. Quickly enable/disable given rules
2. Quickly enable/disable given templates

A major disadvantage is that once converted to this form, large PC-PATR grammar files are quite slow to load into the *XMLmind XML Editor*s.

If you are interested in trying this, please contact blackhandrew@gmail.com.

⁴Some keyboards may not work with this sequence. Therefore we also offer the **Ctrl + L** option.