

Toolbox Self-Training

How to use the Field Linguist's Toolbox

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Version 1.5.4 Oct 2008

Contents

Toolbox Self-Training	1
<u>Chapter 1: Introduction.....</u>	3
<u>1.1. Introduction to Toolbox.....</u>	<u>3</u>
<u>1.2. Introduction to the Self-Training.....</u>	<u>3</u>
<u>1.3. Installing Toolbox.....</u>	<u>3</u>
<u>1.4. Starting a New Toolbox Project.....</u>	<u>4</u>
<u>1.5. Introduction to Exercises.....</u>	<u>6</u>
<u>Chapter 2: The Basics.....</u>	9
<u>2.1. The Toolbox Screen.....</u>	<u>9</u>
<u>2.2. Records and Fields.....</u>	<u>10</u>
<u>2.3. Moving around in a Record.....</u>	<u>11</u>
<u>2.4. Editing inside a Field.....</u>	<u>12</u>
<u>2.5. Viewing Field Names and Markers.....</u>	<u>13</u>
<u>2.5.1. Moving the Dividing Line.....</u>	<u>13</u>
<u>2.5.2. Viewing Both Markers and Names.....</u>	<u>15</u>
<u>2.6. Basic Dictionary Markers.....</u>	<u>17</u>
<u>2.7. Inserting and Deleting Fields.....</u>	<u>20</u>
<u>2.8. Inserting a new Record.....</u>	<u>23</u>
<u>2.9. Moving between Records.....</u>	<u>25</u>
<u>2.10. Search.....</u>	<u>26</u>
<u>2.11. Browse View.....</u>	<u>28</u>
<u>2.11.1. Browse View Basics.....</u>	<u>28</u>
<u>2.11.2. Browse View Column Width.....</u>	<u>31</u>
<u>2.12. Sorting in Browse.....</u>	<u>32</u>
<u>2.12.1. Sorting by Clicking Column Heading in Browse.....</u>	<u>32</u>
<u>2.12.2. Search and Status Bar in Browse View.....</u>	<u>34</u>
<u>2.12.3. A Point of Confusion: Multiple "Entries" in Browse.....</u>	<u>37</u>
<u>Chapter 3: Beyond the Basics</u>	39
<u>3.1. More about Browse.....</u>	<u>39</u>
<u>3.1.1. Browse: Empty and Missing Fields.....</u>	<u>39</u>
<u>3.1.2. Setting Up Browse.....</u>	<u>40</u>
<u>3.2. Moving through the Data: Find.....</u>	<u>43</u>
<u>3.2.1. The Find Command.....</u>	<u>43</u>
<u>3.2.2. Comparing Search and Find.....</u>	<u>46</u>
<u>3.3. Making Data Stand Out (Using Color).....</u>	<u>47</u>
<u>3.3.1. Changing the Appearance of a Language.....</u>	<u>47</u>

4.25 Morphological Summary

3.3.2. Changing the Appearance of a Single Field.....	51
3.4. Filters.....	53
3.4.1. Using a Filter.....	53
3.4.2. Writing a Filter for a Marker.....	54
3.4.3. Writing a Filter for Marker and Text.....	56
3.4.4. Using Browse or Find Instead of a Filter.....	58
Chapter 4: Interlinear Text.....	59
4.1. Introduction to Interlinear Text.....	59
4.2. Interlinearizing Text.....	60
4.3. Preparing a Text for Interlinearization.....	61
4.4. Renumbering Interlinear Text.....	64
4.5. Adding Free Translation.....	66
4.6. Starting Interlinearization.....	66
4.7. Return from Jump in Interlinearization.....	69
4.8. Capitalized Words in Interlinearization.....	71
4.9. Starting Morphology.....	72
4.9.1. Making a Word List.....	72
4.9.2. Sorting a Word List from Both Ends.....	74
4.9.3. Using Word Lists to Analyze Morphology.....	76
4.9.4. Entering Affixes and Roots in the Dictionary.....	77
4.10. Interlinearizing More Text.....	79
4.11. Analyzing Morphological Case.....	82
4.12. Toolbox Shows Possible Affixes.....	85
4.13. Analyzing Noun Class Morphology.....	86
4.14. Automatic Interlinear Update.....	89
4.15. Reshape Interlinear Text.....	91
4.16. Jumping from References.....	96
4.17. Morphophonemics.....	102
4.18. Interlinear Check.....	103
4.19. Adding Another Text.....	104
4.20. Ambiguities.....	106
4.21. Word Formulas.....	109
4.22. Morphophonemics with Environments.....	117
4.23. Concordance.....	118
4.24. More Information on Interlinearizing.....	119
4.25. Morphological Summary.....	120

Chapter 1: Introduction

1.1. Introduction to Toolbox

The Field Linguist's Toolbox is a computer program designed to help linguists organize and analyze language data. Toolbox will help you if you collect field language data, and you want to study, analyze and organize it for publication. Such publication includes dictionaries, annotated text collections and examples for linguistic papers. Publication includes on the web as well as hard copy.

1.2. Introduction to the Self-Training

This self-training guide is designed to provide all you need in order to start using Toolbox effectively. It begins with easy, basic instructions on how to use Toolbox, including exercises that you can use to teach yourself. The exercise instructions are very explicit so that you do not need to know anything about Toolbox in order to do them. You are encouraged to do all the exercises, or at least read through them. They have lots of pictures to show what you would see.

You can open this self-training document from the Windows Start menu by navigating to Programs, Toolbox, Self-Training.

1.3. Installing Toolbox

Toolbox is installed by running a file named something like "InstallToolbox14.exe". The number in the file name gives the version number of Toolbox. For example, number 14 refers to version 1.4. This user's guide is designed for Toolbox 1.4 or higher.

Toolbox is freeware, so if you don't have the current version, you can get it for free. The quickest way to get it is to download it from: www.sil.org/computing/toolbox

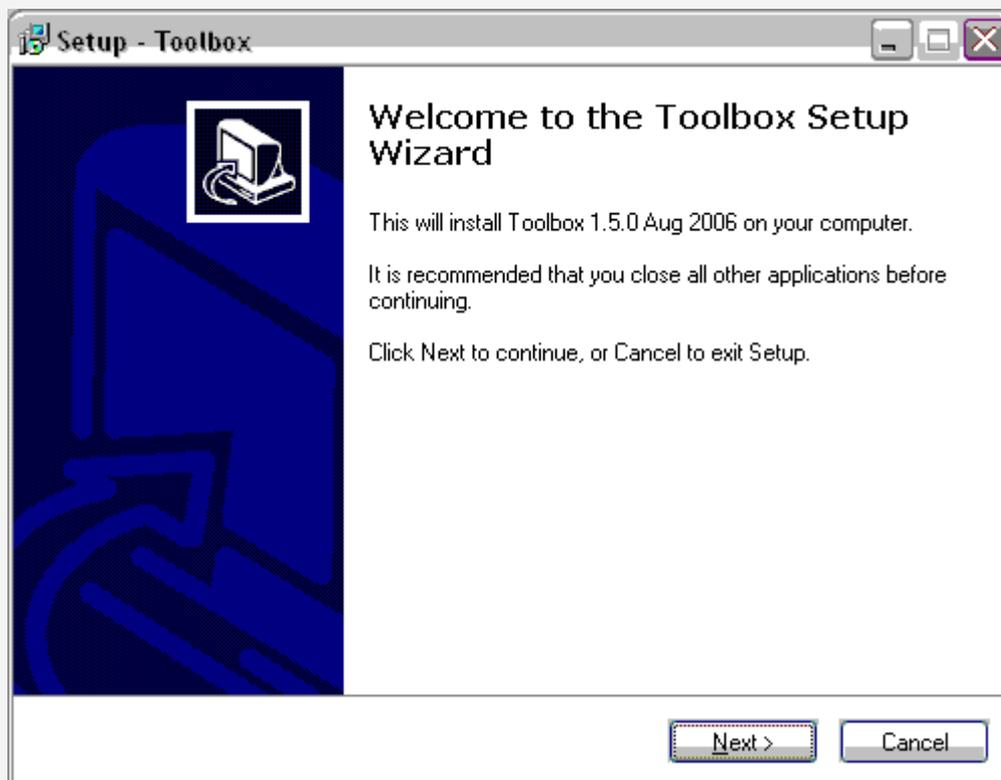
Toolbox is easy to install. All you have to do is run the install file and press Enter in a couple of dialog boxes to accept the default installation options. If you already have an older version of Toolbox, installing a new one will automatically update the older installation.

Installing Toolbox

If you have not already installed Toolbox, here is a walkthrough. The Toolbox install program is named “InstallToolbox14.exe”, except that the number may be higher.

- **To install, double click the Toolbox install program.**

The install screen will look like this:



- **Press Enter multiple times until installation is complete.**

When installation is complete, you will see a red Toolbox shortcut icon on your desktop:



Do not click this icon yet.

1.4. Starting a New Toolbox Project

To set up Toolbox for your own data, you start a new project. This is done by choosing “Start New Project” under Toolbox on the Start menu.

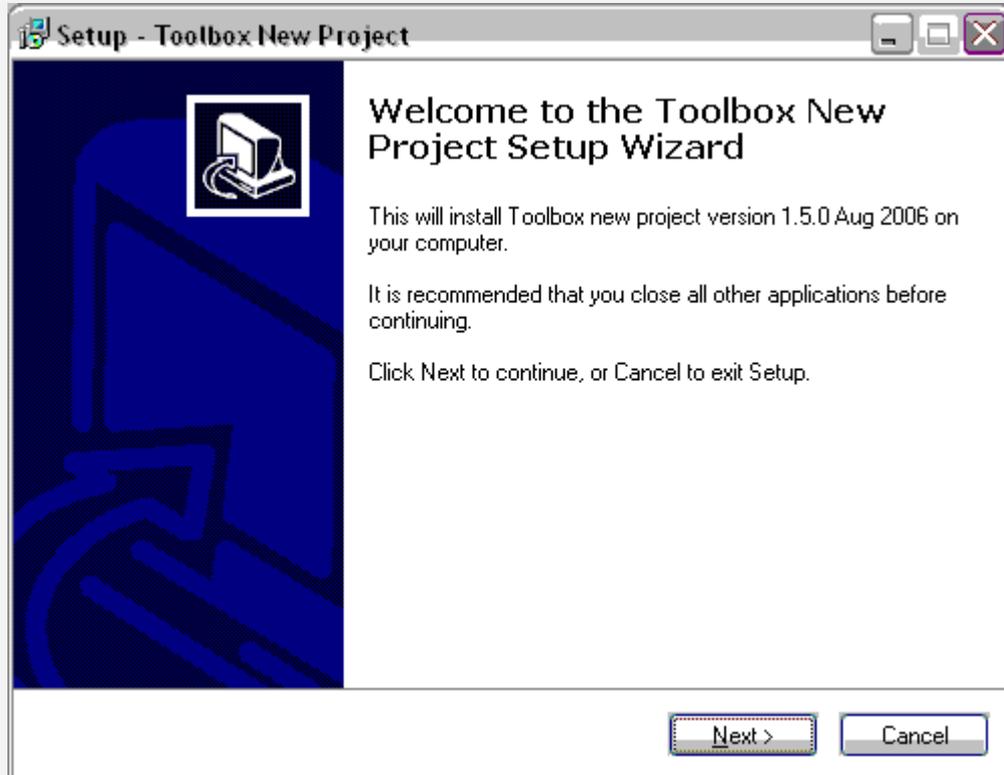
The installer for a new project package works just like the Toolbox installer. It creates a folder with the basic set of files you need for a dictionary and a set of texts.

Starting a New Toolbox Project

Here is a walkthrough of starting a new project.

- **Choose Start, Programs, Toolbox, Start New Project.**

The setup screen will look like this:



- **Press Enter multiple times until installation is complete.**

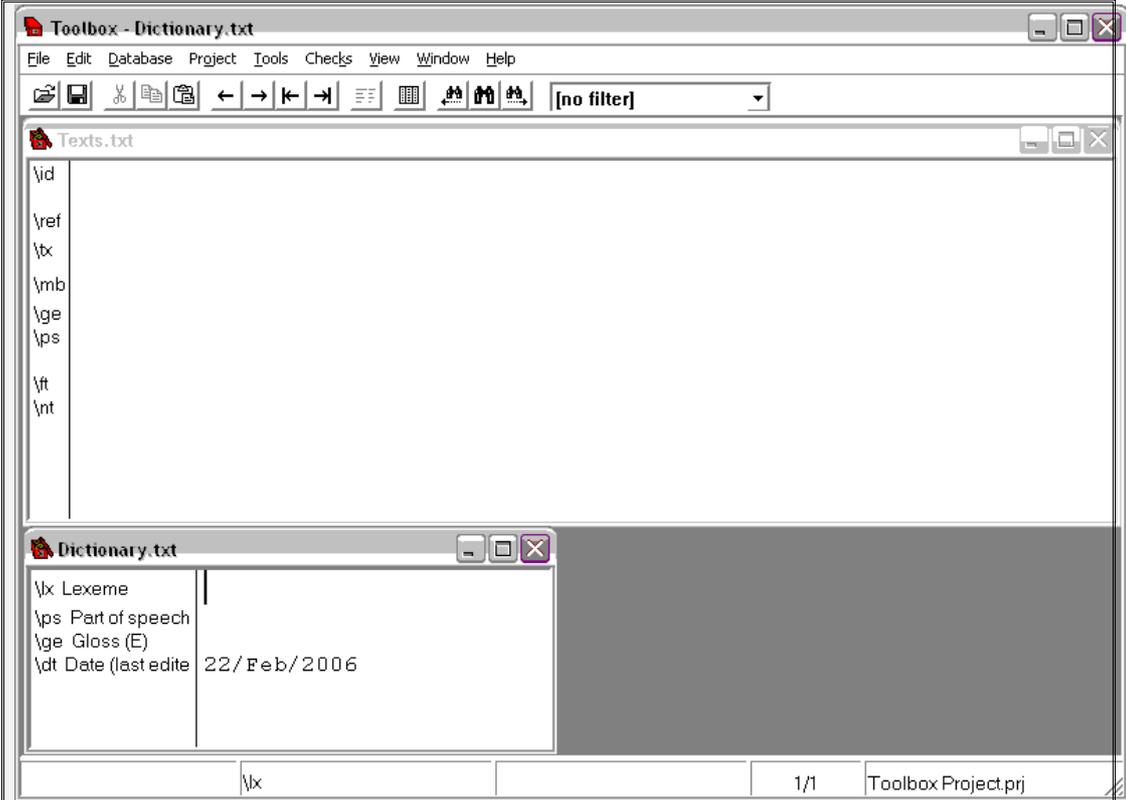
When installation is complete, you will see a red Toolbox Project shortcut icon on your desktop:



- **Double click this icon.**

Toolbox will run, and will show something like the following.

4.25 Morphological Summary



The screenshot shows the Toolbox application interface. At the top is a window titled "Toolbox - Dictionary.txt" with a menu bar (File, Edit, Database, Project, Tools, Checks, View, Window, Help) and a toolbar. Below the toolbar is a list of text files in "Texts.txt": \vid, \vref, \vtx, \vmb, \vge, \vps, \vit, and \vnt. Below this list is a "Dictionary.txt" window showing a table of metadata:

\lx	Lexeme
\vps	Part of speech
\vge	Gloss (E)
\vdt	Date (last edit)

The date is shown as 22/ Feb/ 2006. At the bottom of the interface, there is a status bar with the text "\lx", "1/1", and "Toolbox Project.prj".

The color and appearance of the title bar at the top of the window will be different on your computer, because that is determined by your system settings.

- **Close Toolbox by clicking the big X in the upper right corner.**

1.5. Introduction to Exercises

This document contains lots of exercises. You are encouraged to do each exercise as you come to it.

The files used by exercises are in a folder "Toolbox Self-Training\Exercises" in the same folder as the Toolbox program (probably C:\Program Files").

An exercise is run by double clicking a Toolbox project file. A Toolbox project file has a red icon that looks like a box with the lid open.



To run an exercise, you will open Windows Explorer, navigate to the folder that contains the exercise, and double click on the Toolbox project file.

The exercises contain important information, so even if you decide not to perform an exercise, you should still read through the instructions and look at the pictures.

Exercise: How to run an Exercise

An exercise is in a grey box. Lines in bold and blue are things you should do.

- **Open Windows Explorer.**
- **Navigate to the folder “C:\Program Files”.**

Depending on your system settings, Windows Explorer may say that the files in this folder are hidden. If so, click on the option to “Show the contents of this folder”.

- **Navigate to the folder “Toolbox”.**
- **Navigate to the folder “Toolbox Self-Training”.**
- **Open the folder “Exercises”.**
- **Open the folder “Basics”.**
- **Open the folder “1 Dictionary Sample”.**

You will see a number of files, including a Toolbox project file named “Exercise.prj”. If you have Explorer set to hide file extensions, it will look like this:

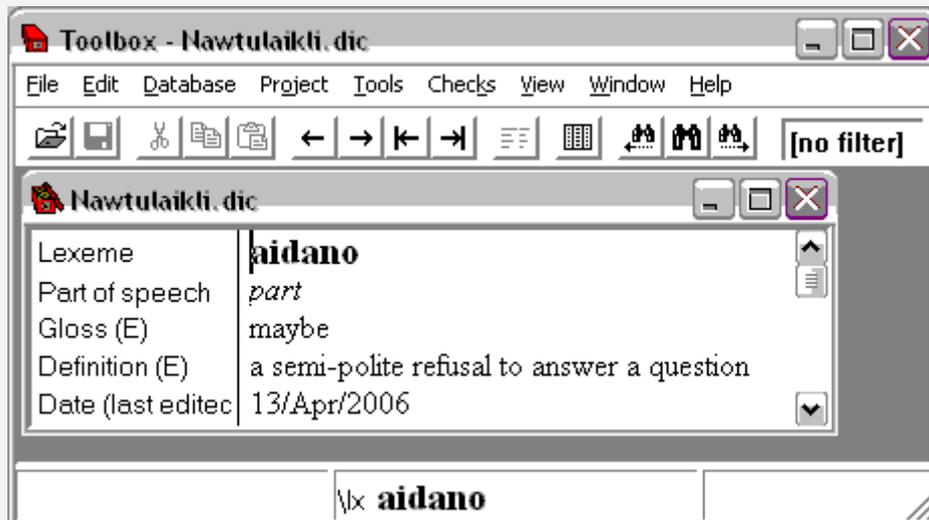


If you have Explorer set to show file extensions, it will look like this:



- **Double click the project file.**

Toolbox will run, and will show the following:



The color and appearance of the title bar at the top of the window will be different on your computer, because that is determined by your system settings.

If Toolbox does not run, or the screen does not look like the above, check to make sure Toolbox is properly installed, and that you opened the correct exercise project file.

When an exercise says “choose”, that means click on a menu item.

4.25 Morphological Summary

- **Choose “Help, About”.**

You will see a box with version information. (The version information will be different than in the picture below.)



When an exercise says “click”, that means to click on something, usually a button.

- **Click OK.**

The “About” box closes.

- **Close Toolbox by clicking the big X in the upper right corner. Do not close the data file.**

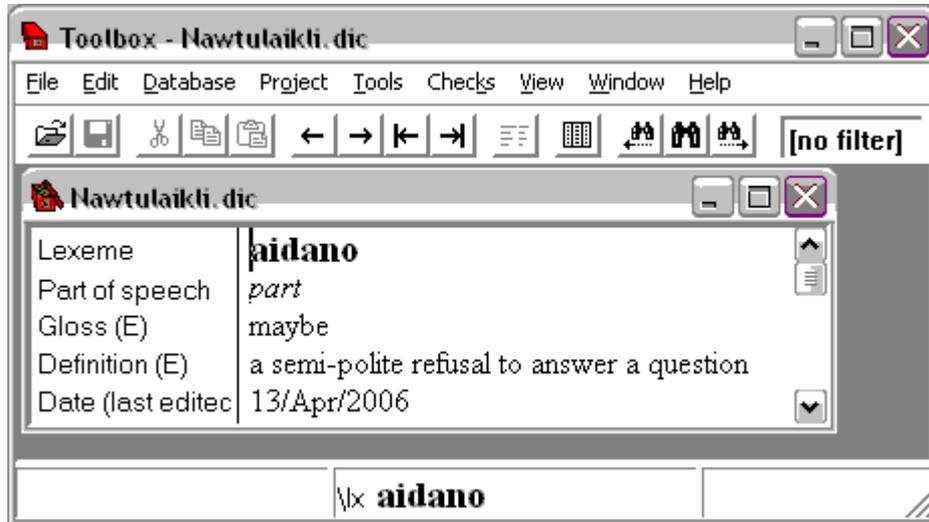
Keep the Windows Explorer open so you can quickly open other exercise projects.

The names of the exercise folders begin with numbers. You should have your Explorer view sorted by file name. That way the exercises will be in correct sequential order so that you can easily move from one exercise to the next.

Chapter 2: The Basics

2.1. The Toolbox Screen

When Toolbox is running a project, it looks like this:



The Toolbox screen consists of four main parts:

- The Menu includes typical items such as File, Edit, and Help, as well as some items which are specific for Toolbox, such as Database and Project.
- The Tool Bar includes some standard items (Open, Save, Cut, Copy, and Paste), and also some items unique to Toolbox. We will be discussing these tools in the next couple sections.
- The Data Window contains your data. It is possible to have multiple data windows open in Toolbox.
- The Status Bar, at the very bottom, has a few useful bits of information.

2.2. Records and Fields

Toolbox often uses the terms “record” and “field” to refer to parts of the data. A record is a complete unit like a dictionary entry. A field is a particular type of data in a record. For example, in the dictionary entry for “aidano” the first field is the Lexeme, “aidano”. The second field is the Part of speech, “part”. Each field has a Field Name on the left of the vertical line and data on the right. (A field does not have to be a single line, though most of the fields in this sample dictionary are.)

The first field of a record is unique. . That is, the first field indicates the beginning of a record. When another lexeme occurs in a dictionary, that means a different entry -- a different record. The first field is sometimes called the key field.

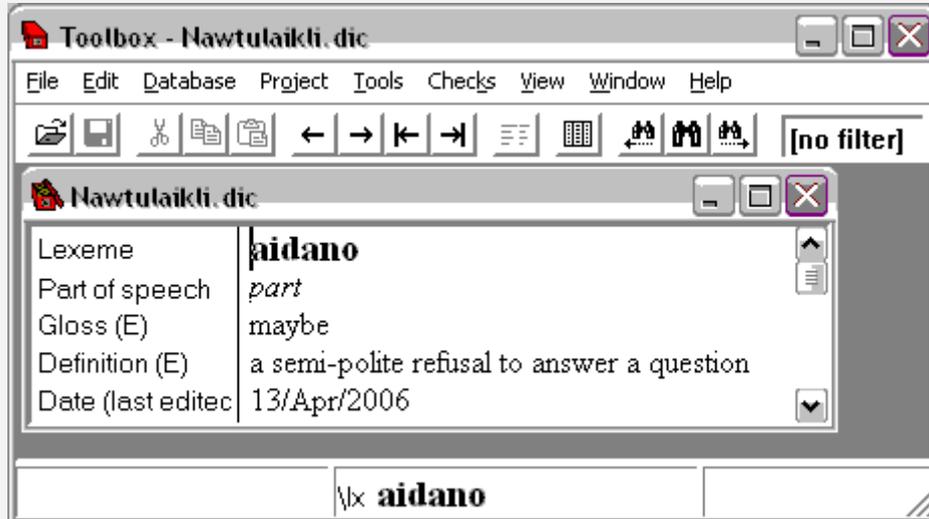
A collection of records is often called a database. However, databases are often referred to by more common names. For example, a database of lexemes is usually called a dictionary or a lexicon. A database of addresses is called an address list (or address book). A database of recipes is called a cookbook or a recipe file. A database of books in a library is called a catalog. In this document we will often refer to the dictionary database as the "dictionary" or the "dictionary file" or even just the "data".

2.3. Moving around in a Record

You can move around in a record using mouse clicks and all the standard keystrokes.

Exercise: Moving around in a Record

- **Open the exercise “1 Dictionary Sample” (double click the file with the red Toolbox icon).**



The title on the data window gives the file name “Nawtulaikli.dic”. Nawtulaikli is a somewhat silly made-up language that resembles some forms of American English slang. For these exercises we will be using this small sample dictionary.

The cursor is blinking in front of “aidano” in the Lexeme field.

- **Click at the end of the word “maybe”.**

The cursor moves to the place you clicked.

- **Press Left Arrow.**

The cursor moves one character to the left.

- **Press Up Arrow.**

The cursor moves up to the end of “part”.

- **Press Right Arrow.**

The cursor moves to the next field, to the front of “maybe”. Notice that the cursor does not move into the field names part of the window.

- **Press Down Arrow.**

The cursor moves to the beginning of the next line.

- **Press End.**

The cursor moves to the end of the line.

- **Press Home.**

The cursor moves to the beginning of the line

4.25 Morphological Summary

- **Hold down the CTRL key and press Right Arrow.**

The cursor moves to front of the next word, “semi-polite”.

- **Do CTRL+Right Arrow to the front of "answer"**

- **Press CTRL+ Left Arrow.**

The cursor moves to the front of the previous word, “to”.

- **Press Ctrl+End.**

The cursor moves to the very end of the data.

- **Press Ctrl+Home.**

The cursor moves to the beginning of the first word, “aidano”.

- **Close Toolbox.**

2.4. Editing inside a Field

To make changes inside a field, you use normal editing operations. You can use the delete or backspace key to delete. When you type something, it is inserted at the cursor position. You can also select all or part of the content of a field and use cut, copy, and paste. (However, you cannot drag selected text to another place.)

Exercise: Editing inside a Field

- **Open the exercise “2 Editing”.**

- **Edit the entry for "fokz" to change the gloss from "men" to "parents".**

Lexeme	fokz
Part of speech	<i>n</i>
Gloss (E)	men

- **Double click the word “men”.**

It is selected.

- **Type “parents”.**

Lexeme	fokz
Part of speech	<i>n</i>
Gloss (E)	parents

- **Close Toolbox.**

2.5. Viewing Field Names and Markers

So far we have looked primarily at the data. For a couple short lessons, we will look at the structure into which the data is fitted.

2.5.1. Moving the Dividing Line

Sometimes the whole Field Name is not visible. This exercise shows how to move the line to see the whole name -- or to see more data.

Exercise: Moving the Dividing Line

- **Open the exercise “3 Field Names”.**

Toolbox will open displaying the record "du nuttin".

The screenshot shows a window titled "Toolbox - Nawtulaikti.dic" with a menu bar (File, Edit, Database, Project, Tools, Checks, View, Window, Help) and a toolbar. Below the toolbar is a smaller window titled "Nawtulaikti.dic" displaying a list of fields and their values for the entry "du nuttin".

Lexeme	du nuttin
Part of speech	v
Gloss (E)	be.interruptable
Definition (E)	to engage in interruptable activity
Subentry	wacha duin
Definition (E)	a greeting
Notes (anthropo)	(proper response: nuttin)
Subentry	nuttin duin
Definition (E)	to refuse
Cross-reference	nuttin
Date (last edit)	30/Apr/2006

At the bottom of the window, there is a status bar showing "\x du nuttin" and "12/54".

You can see there are some new fields used in this entry. (They will be discussed in the next lesson.) One thing you will notice is that some of the names are too long for the little window displaying them.

- **To move the line, move the mouse cursor until it is right on the line between the data and the Field Names. It will turn into a double-headed arrow.¹**

This close-up shows the bottom part of the window. A double-headed arrow cursor is positioned on the vertical line separating the field names from the data. The field names and their corresponding data are:

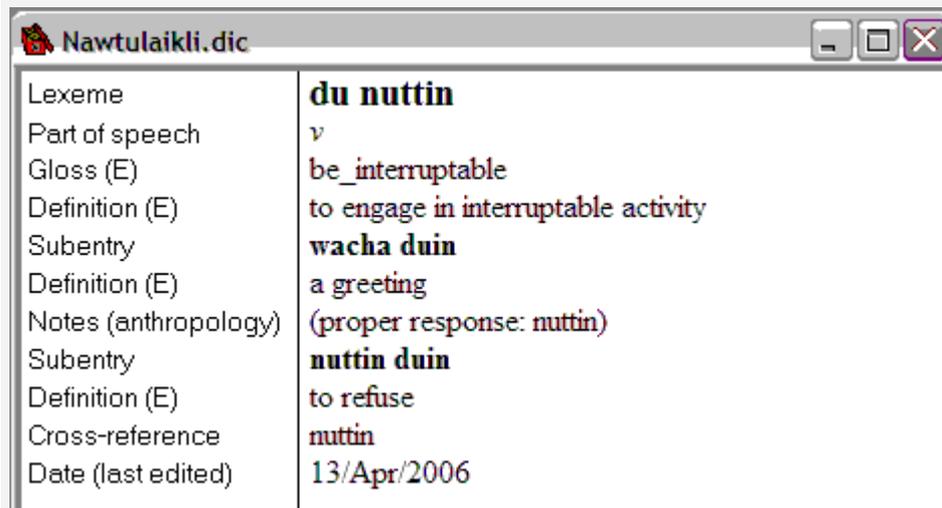
Lexeme	du nuttin
Part of speech	v
Gloss (E)	be_interruptable
Definition (E)	to engage in interruptable activity

¹ For the I-shaped cursor in the text window, this happens when the vertical part of the I is directly over the dividing line. For the arrow-shaped cursor seen if you come from the Field Names, it happens as the right edge of the mouse touches the dividing line.

4.25 Morphological Summary

- **Hold down the left mouse button and drag the line to the right.**

The result will be something like this:



Field	Value
Lexeme	du nuttin
Part of speech	v
Gloss (E)	be <i>interruptable</i>
Definition (E)	to engage in <i>interruptable</i> activity
Subentry	wacha duin
Definition (E)	a <i>greeting</i>
Notes (anthropology)	(proper response: <i>nuttin</i>)
Subentry	nuttin duin
Definition (E)	to <i>refuse</i>
Cross-reference	<i>nuttin</i>
Date (last edited)	13/Apr/2006

Of course, you can also drag the line the other direction to make more room for the data.

- **Close Toolbox.**

2.5.2. Viewing Both Markers and Names

There is more than one way to view the Field Names.

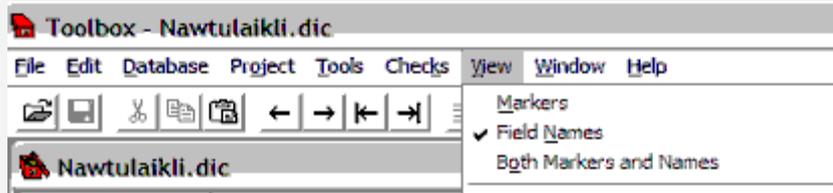
Exercise: Viewing Both Markers and Names

- **Open the exercise “3 Field Names” (again).**

Toolbox will open displaying the record "du nuttin".

- **Click on View on the main menu bar.**

The first three items are the focus for this lesson. You will notice that "Field Names" is checked.



- **Click on Both Markers and Names.**

The menu will close and the view of the data window will change to the following:

Nawtulaikli.dic	
\lx Lexeme	du nuttin
\ps Part of speech	v
\ge Gloss (E)	be <u>interruptable</u>
\de Definition (E)	to engage <u>in interruptable activity</u>
\se Subentry	wacha duin
\de Definition (E)	a <u>greeting</u>
\na Notes (anthropolog	<u>(proper response: nuttin)</u>
\se Subentry	nuttin duin
\de Definition (E)	to <u>refuse</u>
\cf Cross-reference	nuttin
\dt Date (last edited)	13/Apr/2006

Something new has appeared to the right of the Field Names. In Toolbox, these are called "Markers". They are something like an abbreviation for the Field Name. If you compare the markers to the names, you will see the similarity.

Markers are what are actually stored in the Toolbox data. They are associated with their corresponding Field Names via one of the Toolbox settings files.²

Markers always start with a backslash. All these happen to have two letters following. That is not required, but sometimes you have to type the marker, so the shorter the better.

Sometimes in Toolbox, it is important to know the Marker. So it is good to become familiar with the markers that are associated with the Field names. (The set of markers we are using is discussed in a following lesson.)

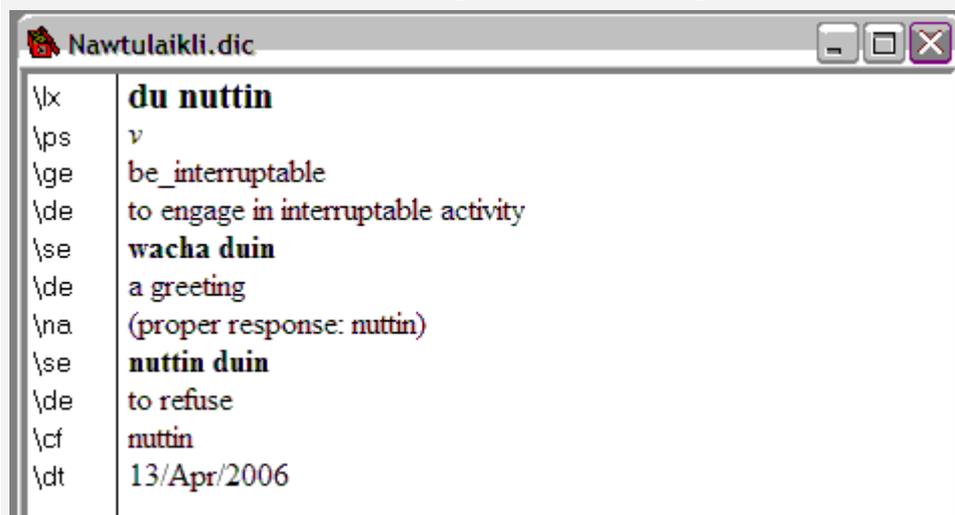
² The "Database Type" files associate the markers and the Field Names. These will be discussed in the Advanced section.

4.25 Morphological Summary

As you might guess from the menu options, it is possible to view only the markers.

- **Click on View, Markers.**

The view in the data window changes to the following:



This is rather terse, and you may not be comfortable using them. But now you know how to change from one view to the other.

- **Close Toolbox.**

2.6. Basic Dictionary Markers

The examples in this training material and the Start-up Kit associated with it use the MDF marker set. These are not the only markers that can be used for dictionaries in Toolbox, but MDF has become a world-wide standard. So it is being recommended both explicitly and by example.

These markers are described in *Making Dictionaries, A guide to lexicography and the Multi-Dictionary Formatter*,³ by David Coward and Chuck Grimes, published by SIL in 1995. The manual describes both the marker set and the means of printing dictionaries structured with these markers. Many things have changed in computing since the book was published, and the way to print has been changed significantly. But the set of markers is still relevant.

The marker set will be discussed in more detail in the section on dictionaries. But a bit of information is relevant at this point.

The Nawtulaikli dictionary uses the following markers:

Marker	Field Name
\an	Antonym
\cf	Cross Reference
\de	Definition (E)
\dt	Date
\ge	Gloss (E)
\hm	Homonym number
\lx	Lexeme
\na	Notes (anthropology)
\nt	Notes (general)
\pdl	Paradigm label
\pdv	Paradigm form
\ps	Part of Speech
\se	Subentry
\sn	Sense Number
\sy	Synonym
\xe	Example free trans. (E)
\xv	Example (v)

The "(E)" is short for "English". There are, for example, fields for the definition or gloss in the national language "(n)", and in the regional language "(r)". The "(v)" is a reminder that the example is in the vernacular language. You can see these language indicators reflected in the markers themselves.

³ The book is available as a PDF download from the SIL website. It is also linked from the Toolbox website.

4.25 Morphological Summary

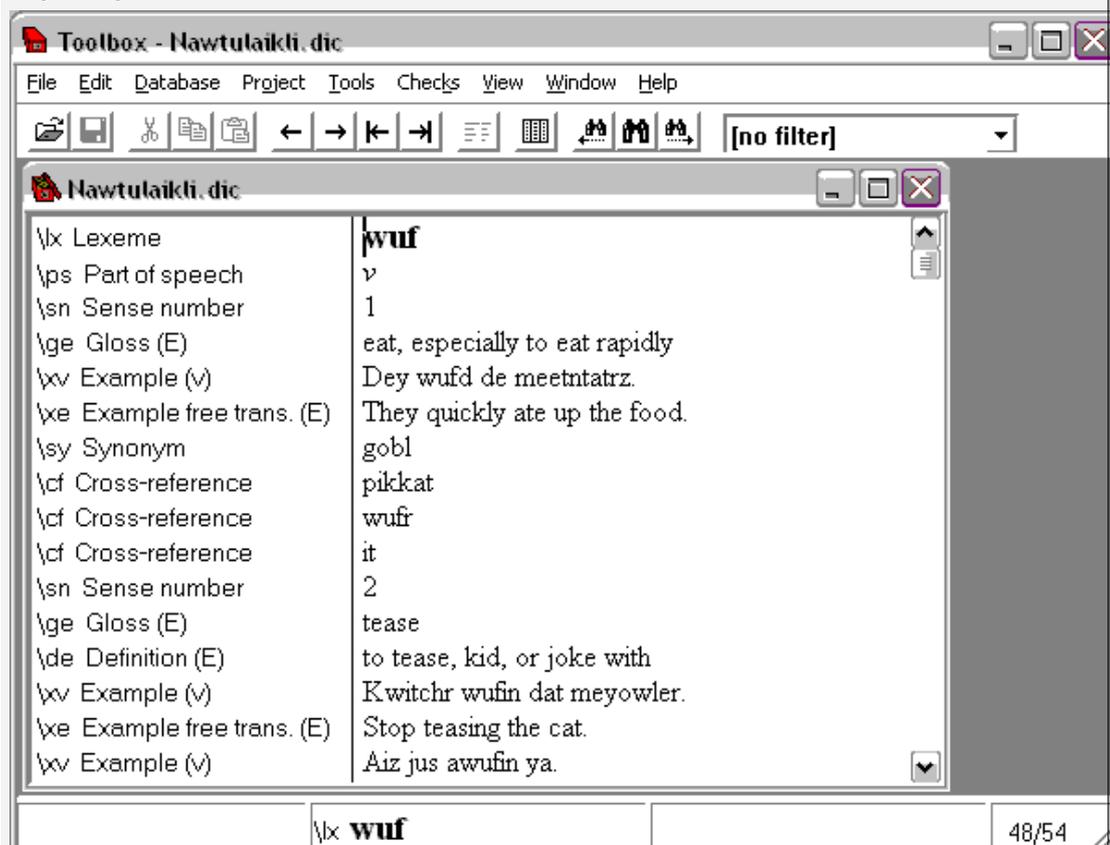
This is nowhere near the entire list of markers available to users of MDF. In fact there are markers available for almost all needs in a dictionary.⁴

While the names are reasonably descriptive, you may still feel insecure about how to use a marker. There are three sources of information available. One is in Toolbox itself which will be demonstrated in a moment. Another is the database "MDFields" which will be introduced in the section on dictionaries. The third and most detailed is the MDF manual itself.

Exercise: Basic Dictionary Fields

- **Open the exercise "4 Basic Fields".**

Toolbox will open displaying the record "wuf". It has more variety of markers than any entry shown so far.



The screenshot shows the 'Toolbox - Nawtulaikti.dic' application window. The menu bar includes File, Edit, Database, Project, Tools, Checks, View, Window, and Help. The toolbar contains various icons for file operations and navigation. The main area displays a list of fields and their corresponding values for the entry 'wuf'. The fields are listed on the left, and the values are on the right. The entry 'wuf' is highlighted in the top row.

Field Name	Value
\x Lexeme	wuf
\ps Part of speech	v
\sn Sense number	1
\ge Gloss (E)	eat, especially to eat rapidly
\v Example (v)	Dey wufd de meetntatrz.
\xe Example free trans. (E)	They quickly ate up the food.
\sy Synonym	gobl
\cf Cross-reference	pikkat
\cf Cross-reference	wufr
\cf Cross-reference	it
\sn Sense number	2
\ge Gloss (E)	tease
\de Definition (E)	to tease, kid, or joke with
\v Example (v)	Kwitchr wufin dat meyowler.
\xe Example free trans. (E)	Stop teasing the cat.
\v Example (v)	Aiz jus awufin ya.

At the bottom of the window, there is a status bar showing the current entry as '\x wuf' and the page number as '48/54'.

- **Place the mouse cursor over the Field Name of the Part of Speech field.**

\x Lexeme	wuf
\ps Part of speech	v
\sn Sense number	1

- **Right click.**

Toolbox will bring up a rather full dialog box titled Marker Properties. Various exercises will explain other parts of the dialog box. At the moment, notice the Marker itself, the Field Name (highlighted), and, particularly, the description at the bottom of the dialog box.

⁴ Some have found insufficiencies, for example in the number of scripts available. These issues will be discussed in the section on dictionaries.

The screenshot shows a dialog box titled "Marker Properties - \ps Part of speech". It has three tabs: "General", "Range Set", and "Data Properties". The "General" tab is active. Fields include:

- Marker: (without \): ps
- Field Name: Part of speech
- Under what in the Hierarchy: se Subentry
- Marker for following field: [none]
- Language Encoding: English
- Style to Export: Character (selected), Paragraph
- Use Language Font: unchecked
- Buttons: Choose Font..., Language Properties...

 The "Description" field is highlighted with a red border and contains the following text:

Classifies the part of speech. This must reflect the part of speech of the vernacular lexeme (not the national or English gloss). Consistent labeling is important; use the Range Set feature. Sense numbers are beneath \ps in this hierarchy; don't mark different \ps fields with sense numbers.

 At the bottom are buttons for "OK", "Cancel", and "Help".

The description gives information about the function of the marker. In this case there are also admonitions ("must reflect the part of speech of the vernacular lexeme (not the national or English gloss)") and advice ("use the Range Set feature"⁵) and information about the position of the marker relative to other fields ("Sense numbers are beneath \ps ").

Not all marker descriptions are quite as full, but all the MDF markers have a description.

- **Scroll through the entry and read the descriptions of various of the fields.**

As we are doing these exercises, if you are wondering what a marker is for, now you know how to check.

- **Exit Toolbox.**

⁵ This will be covered in the section on Dictionaries, Consistency Checking.

2.7. Inserting and Deleting Fields

To insert a new field, you use Edit, Insert Field. To choose which field you want to insert, you enter an abbreviation (called a “field marker”) instead of the field name.

To delete a field, you select the whole field by clicking in the field name. Then you press the delete key to delete the field. You can also use cut, paste, and copy on whole fields.

Exercise: Inserting and Deleting Fields

- Open the exercise “4 Basic Fields”.

The screenshot shows a window titled "Toolbox - Nawtutaikli.dic" with a menu bar (File, Edit, Database, Project, Tools, Checks, View, Window, Help) and a toolbar. Below the toolbar is a smaller window titled "Nawtutaikli.dic" displaying a dictionary entry for the word "wuf".

\x Lexeme	wuf
\ps Part of speech	v
\sn Sense number	1
\ge Gloss (E)	eat, especially to eat rapidly
\v Example (v)	Dey wufd de meetntatz.
\xe Example free trans. (E)	They quickly ate up the food.
\sy Synonym	gobl
\cf Cross-reference	pikkat
\cf Cross-reference	wufr
\cf Cross-reference	it
\sn Sense number	2
\ge Gloss (E)	tease
\de Definition (E)	to tease, kid, or joke with
\v Example (v)	Kwitchr wufin dat meyowler.
\xe Example free trans. (E)	Stop teasing the cat.
\v Example (v)	Aiz jus awufin ya.

At the bottom of the window, there is a status bar showing "\x wuf" and "48/54".

- Do previous record (Alt+P) five times to get to “shrubby”.

\x Lexeme	shrubby
\ps Part of speech	n
\ge Gloss (E)	tree

We will add another gloss to this entry.

- Place the cursor at the end of the word “tree”.
- Choose Edit, Insert Field.

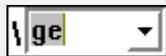
You will see a list of field abbreviations.



The abbreviation of Gloss (E) is “ge”.

- **Scroll down and click on “ge”.**

It is placed in the box.



- **Press Enter.**

A new gloss field is inserted.

\x Lexeme	slrubbry
\ps Part of speech	ʔ
\ge Gloss (E)	tree
\ge Gloss (E)	

- **Type “hedge”.**

\x Lexeme	slrubbry
\ps Part of speech	ʔ
\ge Gloss (E)	tree
\ge Gloss (E)	hedge

To save time in inserting a marker, you can type the abbreviation of the marker instead of clicking on it.

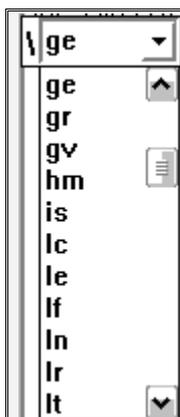
- **Choose Edit, Insert Field.**

The list of field abbreviations appears.

- **Type “ge”.**

What you type goes into the box.

4.25 Morphological Summary



- **Press Enter.**

A new gloss field is inserted.

- **Type “bush”.**

\x Lexeme	shrubby
\ps Part of speech	??
\ge Gloss (E)	tree
\ge Gloss (E)	hedge
\ge Gloss (E)	bush

To delete a field, select it and press delete. To select a field, click in the field name.

- **Click in the field name “Gloss (E)” of the line with “hedge”.**

The entire field is selected, both the field name and the field contents.

\x Lexeme	shrubby
\ps Part of speech	??
\ge Gloss (E)	tree
\ge Gloss (E)	hedge
\ge Gloss (E)	bush

- **Press delete.**

The field is deleted.

\x Lexeme	shrubby
\ps Part of speech	??
\ge Gloss (E)	tree
\ge Gloss (E)	bush

- **Close Toolbox.**

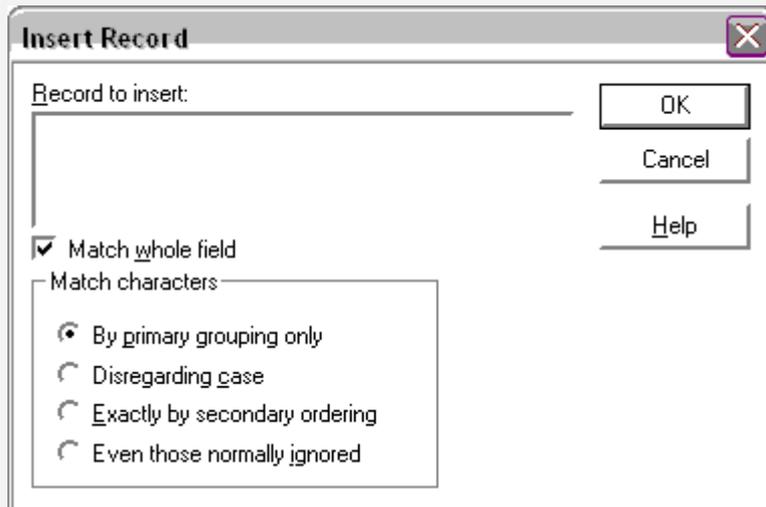
2.8. Inserting a new Record

One of the most common things you will do is to insert a new dictionary entry. This is done using the menu command Database, Insert Record.

Exercise: Inserting a new Record

- **Open the exercise “4 Basic Fields”.**
- **Choose Database, Insert Record. (Click on the “Database” menu item, then click on the “Insert Record” menu item under it.)**

You will see a dialog box with a place for you to type the lexeme of the record you want to insert. The items in the lower part of this box are not important at this time.



We will insert a new dictionary entry for “boldr”, meaning “rock”.

- **Type “boldr”.**
- **Click OK.**

You will see a new record for the word “boldr”. The fields for part of speech and gloss are empty.

\x Lexeme	boldr
\ps Part of speech	
\ge Gloss (E)	

- **Type "n" as the part of speech.**

To move to the next field, you can use Tab or the mouse or down arrow. (Do not try to use the Enter key to move to a new field. It inserts a new line in the current field.)

- **Press Tab to move the cursor from the part of speech field to the gloss field.**
- **Type "rock" as the gloss.**

The new record is complete.

To save time, you can use the shortcut key Ctrl+N to insert a new record. (It is shown on the menu as a reminder.)

- **Press Ctrl+N.**

You will see the “Insert Record” box.

4.25 Morphological Summary

- **Type “bald”.**

To save time, you can press Enter instead of clicking the OK button.

- **Press Enter.**

The new entry is inserted.

- **Enter “adj” as the part of speech, and “cooked in water” as the gloss.**

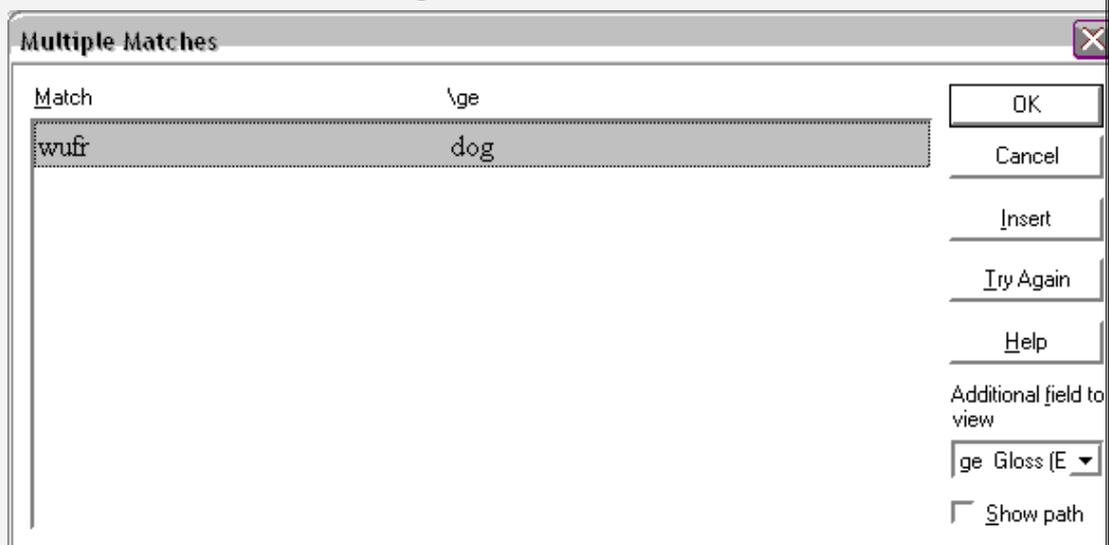
If you try to insert a word that is already in the dictionary, Toolbox warns you.

- **Press Ctrl+N.**

- **Type “wufr”.**

- **Press Enter.**

You will see a box titled “Multiple Matches”.



This says that the lexeme “wufr” already exists in the dictionary. If you click OK, Toolbox will show you the existing entry. If you click “Insert”, Toolbox will insert another entry with the same lexeme.

- **Click OK.**

You will see the entry for “wufr”.



- **Close Toolbox.**

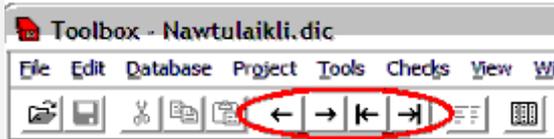
2.9. Moving between Records

Since a data window shows just one record, there are various ways to move to another record.

Exercise: Moving to the Next Record

- **Open the exercise “4 Basic Fields”.**

The toolbar contains a set of four buttons with arrows.



The right-pointing arrow goes to the next record.



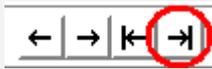
- **Click the right-pointing arrow button.**

You will see the next dictionary entry, "wufr".

- **Click the left-pointing arrow button.**

You will see the entry for "wuf" again.

The right-pointing arrow up against a line indicates the last record.



- **Click the "Last Record" button.**

You will see the entry for "-z".

The left-pointing arrow up against a line indicates the first record.

- **Click the "First Record" button.**

You will see the entry for "abrd".

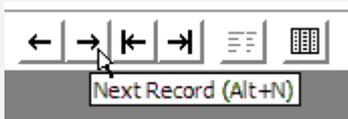
If you try to move past the first entry, nothing will happen.

- **Click the left-pointing arrow.**

Nothing changes. You are already at the top. Your computer may beep.

The buttons can tell you what they do.

- **Rest the mouse pointer on the right-pointing arrow button for a second or so without clicking.**



You will see the words "Next Record (Alt+N)" appear.

Alt+N says that the key combination of the "Alt" key plus the "n" key can be used as a shortcut for this operation.

4.25 Morphological Summary

- **Press Alt+N. (Hold down the Alt key, and press “n”.)**

You will see the entry for "aidano" appear.

When you exit Toolbox, you should not close data windows. Toolbox remembers the data windows and opens them automatically the next time you open the project⁶.

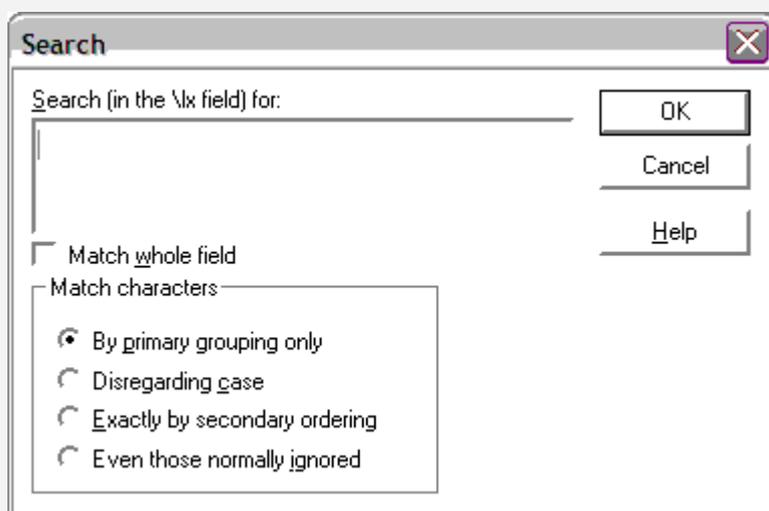
- **Close Toolbox.**

2.10. Search

The "Next Record" and "Previous Record" are very useful, but sometimes you want to go to an entry which isn't anywhere near your present location. To locate a dictionary entry, use the “Search” command. This is the fastest way to move some distance in the dictionary.

Exercise: Search

- **Open the exercise “4 Basic Fields”.**
- **Choose Database, Search.**



This dialog box includes a place to fill in the entry you want to search for, plus some options.

- **Type “wufr”.**
- **Press Enter. (In a dialog box, Enter means the highlighted button, usually OK.)**

You will see the entry for “wufr”.

Lexeme	wufr
Part of speech	n
Gloss (E)	dog
Notes (general)	try to get the difference between a 'wufr' and a 'wuf'!

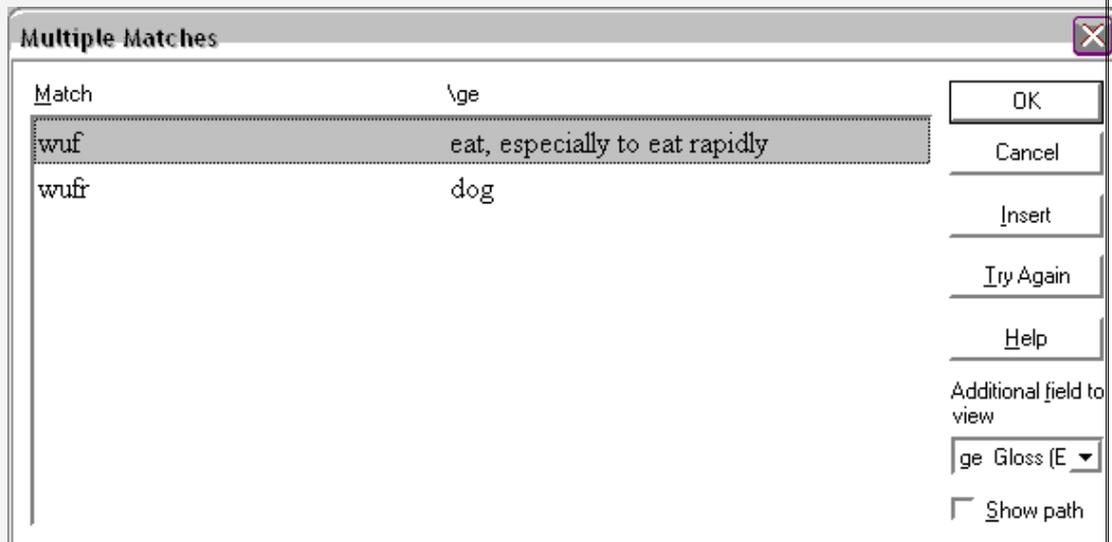
⁶ You can't test this as these exercises are "frozen" and will always come up the same regardless of how you exit.

Because search is used a lot, it is good to learn its keyboard shortcut, "Alt+S".

- **Press Alt+S.**

Notice that the default setting in the search dialog box is not to match the whole field. This means search will include all entries that start with what you type.

- **Type “wuf”.**
- **Press Enter.**



The multiple matches box says that both “wuf” and “wufr” start with “wuf”.

- **Press Enter.**

You will see the entry for “wuf”.

Lexeme	wuf
Part of speech	v
Sense number	1
Gloss (E)	eat, especially to eat rapidly
Example (v)	Dey wufd de meetntatz.

(There is more of the entry than is shown.)

- **Close Toolbox.**

In these exercises “Search” looks only at the lexeme field. Later we will see how to make it look at other fields. Also, “Search” looks only at the beginning of the field. Later we will see how to use “Find” to look anywhere inside fields.

2.11. Browse View

2.11.1. Browse View Basics

You can change the data window from normal view to "Browse" view, which shows the dictionary in columns. This is a useful way to see a summary of the dictionary entries. It is also another way to move quickly from one entry to another.

Exercise: Browse View Basics

- **Open the exercise “5 Browse View”.**

This is the same file as previous exercises, but it is shown in browse view.

Lexeme	Part of speech	Gloss (E)
abrd	<i>prep</i>	on
aidano	<i>part</i>	maybe
byon the pail	<i>adj</i>	far.out
clam	<i>v</i>	ascend
chun	<i>n</i>	shellfish
-d	<i>vsf</i>	Pst
dat	<i>dem</i>	that
de	<i>art</i>	the
dem	<i>dem</i>	those
der	<i>art</i>	the
dey	<i>pron</i>	they
du nuttin	<i>v</i>	be.interruptable
e	<i>pron</i>	he

The dictionary is shown in columns. At the top of each column is the field name.

To turn browse view on and off, one clicks on the "Browse" button.



- **Click the browse button.**

You will see the entry for “abrd” shown in normal view.

Lexeme	abrd
Part of speech	<i>prep</i>
Gloss (E)	on
Definition (E)	on top of, on board (a train or ship)
Date (last edited)	13/Apr/2006

- **Click the browse button again to change back to browse view.**

When you are in browse view, you can use the scroll bar to scroll through the dictionary, and you can use a mouse click to select an entry.

- **Scroll down and click on the line for “fishy”.**

Lexeme	Part of speech	Gloss (E)
e	<i>pron</i>	he
et	<i>v</i>	ate
far out	<i>adj</i>	wild
fishy	<i>n</i>	fish
flauwy	<i>n</i>	flower

The highlight moves to that entry.

You can change from browse view to normal view by double clicking.

- **Double click in the word “flauwy”.**

Lexeme	flauwy
Part of speech	<i>n</i>
Gloss (E)	flower
Date (last edited)	13/Apr/2006

- **Click the browse button to go to browse view.**

When you double click to change to normal view, the cursor shows at the place where you did the double click.

- **Double click at the end of the word “flower”.**

Lexeme	flauwy
Part of speech	<i>n</i>
Gloss (E)	flower

The view changes to normal, and the cursor is at the end of the word “flower”.

- **Click the browse button to go to browse view.**

You can Search while in browse view.

- **Search (Alt+S) for “lug”.**

katrwallin	<i>n</i>	song
las	<i>adv</i>	previous
lug	<i>n</i>	ear
meetnatrz	<i>n</i>	food

The highlight moves to “lug”. The window stays in Browse view.

Pressing Enter is another way to change from browse to normal view.

- **Press Enter.**

The window changes to normal view.

4.25 Morphological Summary

Lexeme	lug
Part of speech	n
Gloss (E)	ear

Alt+R is the keyboard shortcut for entering or leaving Browse view.

- **Press Alt+R.**

The window changes to Browse view.

The "Next Record" keys also work in Browse view.

- **Click on the Next Record arrow (or type Alt+N)**

Since Browse is a single window, the Ctrl+Home and Ctrl+End keys work here as they do in any other window.

- **Press Ctrl+Home**

The window goes to the first record, "abrd".

- **Close Toolbox.**

2.11.2. Browse View Column Width

It is useful to change the width of the columns in Browse view, especially if you have several columns and some (like the Part of Speech) contain only narrow data.

Exercise: Browse View Column Width

- **Open the exercise "5 Browse View".**

To modify the width of a column, just grab the dividing lines and drag with the line to where you want it.

- **Move your mouse cursor until the point would touch the line between the "Lexeme" and the "Part of speech".**

The cursor becomes a double-headed arrow pointing right and left.

Lexeme	Part of speech	Gloss (E)
abrd	<i>prep</i>	on
aidano	<i>part</i>	maybe
byon the pail	<i>adj</i>	far.out
clam	<i>v</i>	ascend
clun	<i>n</i>	shellfish

- **Hold down the left mouse button and drag the line left until it is close to "pail".**

Lexeme	Part of speech	Gloss (E)
abrd	<i>prep</i>	on
aidano	<i>part</i>	maybe
byon the pail	<i>adj</i>	far.out
clam	<i>v</i>	ascend
clun	<i>n</i>	shellfish

- **Now drag the line between "Part of speech" and "Gloss (E)" until it is nearly touching "prep".**

Lexeme	Part of	Gloss (E)
abrd	<i>prep</i>	on
aidano	<i>part</i>	maybe
byon the pail	<i>adj</i>	far.out
clam	<i>v</i>	ascend
clun	<i>n</i>	shellfish

You can see that the title "Part of speech" is partly covered, but it is still obvious what the column is. Now there is room to see long glosses, if we had any. In a later lesson we will show how to add more columns.

- **Exit Toolbox**

2.12. Sorting in Browse

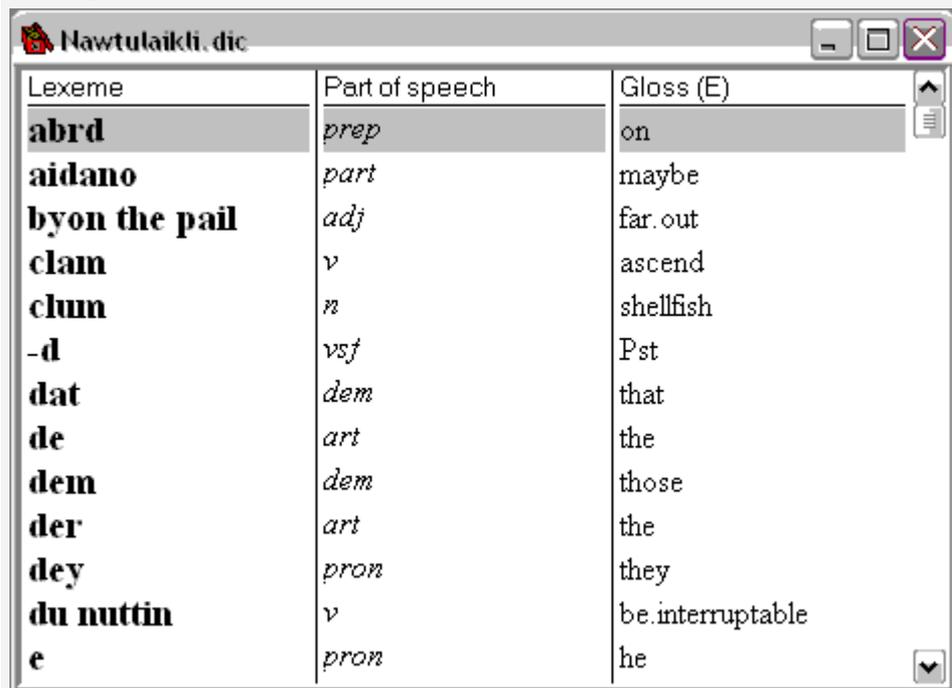
2.12.1. Sorting by Clicking Column Heading in Browse

You can change the sorting of a window by clicking on the Field Name at the top of the Browse view.

Exercise: Sorting in Browse

- **Open the exercise “5 Browse View”.**

Because exercise settings are not saved, the columns are again equally divided, as before. If this were not an exercise, you would see the columns with the widths set in the previous lesson.



Lexeme	Part of speech	Gloss (E)
abrd	<i>prep</i>	on
aidano	<i>part</i>	maybe
byon the pail	<i>adj</i>	far.out
clam	<i>v</i>	ascend
chun	<i>n</i>	shellfish
-d	<i>vsf</i>	Pst
dat	<i>dem</i>	that
de	<i>art</i>	the
dem	<i>dem</i>	those
der	<i>art</i>	the
dey	<i>pron</i>	they
du nuttin	<i>v</i>	be.interruptable
e	<i>pron</i>	he

Looking at the Lexeme column you can see that the entries are in alphabetical order by lexeme.

You can change the sort to another column by clicking on the top of the column.

Lexeme	Part of speech	Gloss (E)
--------	----------------	-----------

- **Click on “Part of Speech”.**

Lexeme	Part of Speech	Gloss
shrubby	n	tree
stinkinrat	n	mouse
tweetr	n	bird
wuf	n	eat
wufr	n	dog
yukibug	n	insect
-z	nsf	P1
aidano	part	maybe
abrd	prep	on
fm	prep	from
t'	prep	to
dey	pron	they
'e	pron	he
ya	pron	you
clam	v	ascend

Sorting changes to part of speech. You can see that there is only one “part” (particle). There are three each of “prep” and “pron”. Looking at the “n” section you can see that within the same part of speech, sorting is by lexeme⁷. This is because previously sorting was by lexeme.

- **Click on “Gloss”.**

yukibug	n	insect
z	v	is
moomoo	n	kind of dress
aidano	part	maybe
fokz	n	men
stinkinrat	n	mouse
nuttin	n	nothing

Sorting changes to gloss.

- **Click on “Part of Speech”.**

Scrolling up you can see that in the same part of speech, sorting is by gloss, which was the previous sorting.

- **Close Toolbox.**

⁷ This left-over sorting is called "secondary sorting" and is often done on purpose. For example, you want your lexicon sorted by the lexeme, but if you have homonyms, you want them in numeric order also. This would be a secondary sorting of the homonyms.

2.12.2. Search and Status Bar in Browse View

When sorting by something other than the lexeme (or something other than the first field of the record, if your data isn't a dictionary), Toolbox tells you by showing you some information on the Status Bar.

Also, it's important to realize that Search behaves differently -- it searches for data in the field you are sorted by!

Exercise: Search and Status Bar in Browse View

- Open the exercise "5 Browse View".

Notice that the Status Bar, at the bottom of the screen shows the record which is highlighted.

Lexeme	Part of speech	Gloss (E)
abr d	<i>prep</i>	on
aidano	<i>part</i>	maybe
byon the pail	<i>adj</i>	far.out
clam	<i>v</i>	ascend
clun	<i>n</i>	shellfish
-d	<i>vsf</i>	Pst
dat	<i>dem</i>	that
de	<i>art</i>	the
dem	<i>dem</i>	those
der	<i>art</i>	the
dey	<i>pron</i>	they
du nuttin	<i>v</i>	be.interruptable
e	<i>pron</i>	he

\x **abr d** 1/54

- Do a single click on "du nuttin" to highlight that record.

dey	<i>pron</i>	they
du nuttin	<i>v</i>	be.interruptable
e	<i>pron</i>	he

\x **du nuttin** 12/54

Notice that the status bar has changed to show the current record. This is useful when editing a record large enough that the Lexeme field has scrolled off the screen.

- Now, sort by Part of speech. (Click at the top of the Browse window in the "Part of speech" Field Name.)

The screenshot shows the Toolbox application window titled "Nawtulaikli.dic". The menu bar includes File, Edit, Database, Project, Tools, Checks, View, Window, and Help. The toolbar contains various icons for file operations and navigation. A dropdown menu shows "[no filter]".

The main window displays a table with three columns: Lexeme, Part of speech, and Gloss (E). The records are sorted by Part of speech. The record "du nuttin" is highlighted.

Lexeme	Part of speech	Gloss (E)
t	prep	to
dey	pron	they
e	pron	he
ya	pron	you
clam	v	ascend
chun	v	*no field*
du nuttin	v	be.interruptable
et	v	ate
git	v	get
git	v	bother
grain	v	smile
horsnroun	v	play
it	v	eat

The status bar at the bottom shows the current record as "\x du nuttin" and its part of speech as "\ps v". The page number "43/59" is also visible.

Toolbox has added the part of speech to the Status Bar. This is to show that even though the record is the "du nuttin" record, the sorting is by the Part of speech field.

- **Sort by gloss by clicking at the top of the Gloss (E) field.**

Lexeme	Part of speech	Gloss (E)
clam	v	ascend
et	v	ate
z	v	be
du nuttin	v	be.interruptable
tweetr	??	bird
git	v	bother
meeyowlr	??	cat
munnur	??	cow
wufr	??	dog
munu	??	dress
lug	??	ear
it	v	eat
pikkat	v	eat

\x **du nuttin** | \ge be.interruptable | 4/61

The status bar changes to reflect the sorting.

Now let's explore how Search behaves differently when you are sorted by the gloss. Search always looks in the field that is currently used for sorting.

- **Do Alt+S to Search.**

Notice the first line of the dialog box, which we haven't pointed out before:

Search (in the \ge field) for: _____

OK
Cancel
Help

Match whole field

Match characters

By primary grouping only
 Disregarding case
 Exactly by secondary ordering
 Even those normally ignored

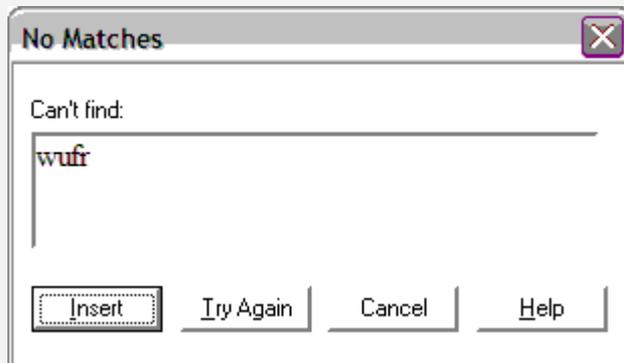
Search actually searches for something in the field you are sorting by, not always in the lexeme.

- **Type "cat" as the data to search for.**

Toolbox moves the highlight to the entry whose gloss is "cat".

- **Do Alt+S and Search for "wufr".**

Search will fail to find the entry, even though you can see it on your screen!



- **Click on the Try Again button.**

The Search dialog box reappears.

- **Edit the dialog box to search for "dog".**

Toolbox highlights the "wufr" entry whose gloss is "dog".

Remember, if you are not sure which field you are sorted by, a quick glance at the Status Bar will tell you.

- **Close Toolbox.**

2.12.3. A Point of Confusion: Multiple "Entries" in Browse

If a single record contains multiple occurrences of the same field, then Browse may not show them all. Browse is only showing a brief summary of the data. The only way you can be sure you are seeing all occurrences of a particular field is to sort by that field. Otherwise you will only see the first occurrence of the field.

For example, if you sort by lexeme, you will only see the first of multiple gloss fields. But if you sort by gloss, then you will see all the gloss fields.

But this opens up a possible point of confusion for some people. All this is illustrated in the exercise below.

Exercise: A Point of Confusion: Multiple "Entries" in Browse

- **Open the exercise "5 Browse View".**
- **Search for "fishy".**
- **Press ENTER to view the entry.**

You will see that "fishy" has two parts of speech, and two glosses.

Lexeme	fishy
Part of speech	<i>n</i>
Gloss (E)	small.fish
Part of speech	<i>adj</i>
Gloss (E)	suspicious

- **Change to browse view.**

There is only one line for “fishy” in the browse view. It shows the first part of speech and the first gloss. Because the browse is sorted by the lexeme, you can see that this is the only entry for “fishy”. If you were to scroll up and down, you would not see the other gloss, “suspicious” anywhere in the list.

far out	<i>adj</i>	wild
fishy	<i>n</i>	small.fish
flauwy	<i>n</i>	flower

- **Click on “Gloss” at the top of the browse to sort by gloss.**

fishy	<i>n</i>	small.fish
grain	<i>v</i>	smile
katrwallin	<i>n</i>	song
meeyowl	<i>n</i>	sound.of.cat
munu	<i>n</i>	sound.of.cow
wuf	<i>n</i>	sound.of.dog
fishy	<i>adj</i>	suspicious

Now if you look down the gloss column, you see both “small.fish” and “suspicious”. In both cases, the lexeme shows “fishy”. When you change to sort by gloss, you see a sorted list of all the gloss fields, even if there are multiple glosses in a single record.

Do not be confused into thinking that the multiple occurrences of “fishy” in the lexeme column refer to multiple records. You are looking at the data from the point of view of the gloss. Both "small fish" and "suspicious" belong to the lexeme "fishy". That is what the Browse is showing you. Both refer to the same record.

To prove this, use Enter to switch to normal view.

- **Edit "fishy" to become "fishyX".**

- **Return to Browse view.**

fishyX	<i>n</i>	small.fish
grain	<i>v</i>	smile
katrwallin	<i>n</i>	song
meeyowl	<i>n</i>	sound.of.cat
munu	<i>n</i>	sound.of.cow
wuf	<i>n</i>	sound.of.dog
fishyX	<i>adj</i>	suspicious

Even though you have edited only one "fishy", "both" have become "fishyX". That is because there really is only one. Remember, you are looking at the data from the point of view of the gloss.

- **Click on “Lexeme” at the top of the browse.**

There is again only one browse line for “fishyX”. Now you are looking at the data from the point of view of the lexeme.

- **Close Toolbox.**

Chapter 3: Beyond the Basics

This chapter is designed to fill in some of the information not given in The Basics. You will find that the exercises assume you have gained the skills taught in The Basics; however, a number of footnotes will be given to remind you how to do things.

3.1. More about Browse

There are a few features that will make Browse view even more useful.

3.1.1. Browse: Empty and Missing Fields

Exercise: Browse: Empty and Missing Fields

- Be sure to navigate to the "Beyond the Basics" folder for the exercises in this chapter!
- Open the exercise "1 More Browse".
- Insert a new record, "skeetr".⁸
- Specify "n" as the part of speech.
- Leave the gloss empty.

The record should look like this:

Lexeme	skeetr
Part of speech	<i>n</i>
Gloss (E)	

- Now change to Browse view.⁹

The Browse view should look like this:

shrubbry	<i>n</i>	tree
skeetr	<i>n</i>	*empty*
stinknat	<i>n</i>	mouse

Browse is telling you that the gloss field is there, but that it has no contents.

- Change back to normal view.¹⁰
- Delete the Gloss field.¹¹
- Change back to Browse view.

Now Browse tells you that the gloss field is missing.

shrubbry	<i>n</i>	tree
skeetr	<i>n</i>	*no field*
stinknat	<i>n</i>	mouse

- Close Toolbox.

⁸ To insert a record, use Ctrl+N. Fill in the box with "skeetr" (without the quotes).

⁹ You can get to Browse view by clicking on the Browse button or by typing Alt+r.

¹⁰ To return to normal view, press ENTER or type Alt+R, or click on the Browse button.

¹¹ To delete a whole field, double click on the field name and press Delete. If the field is a single line, a single click will select it.

3.1.2. Setting Up Browse

You may want to do this exercise more than once. Setting up the Browse fields is a skill well worth knowing.

Exercise: Setting Up Browse

- **Open the exercise “1 More Browse”.**

The next section uses the markers themselves, rather than the Field Names. Just as a reminder, switch to viewing the markers as well as the names.

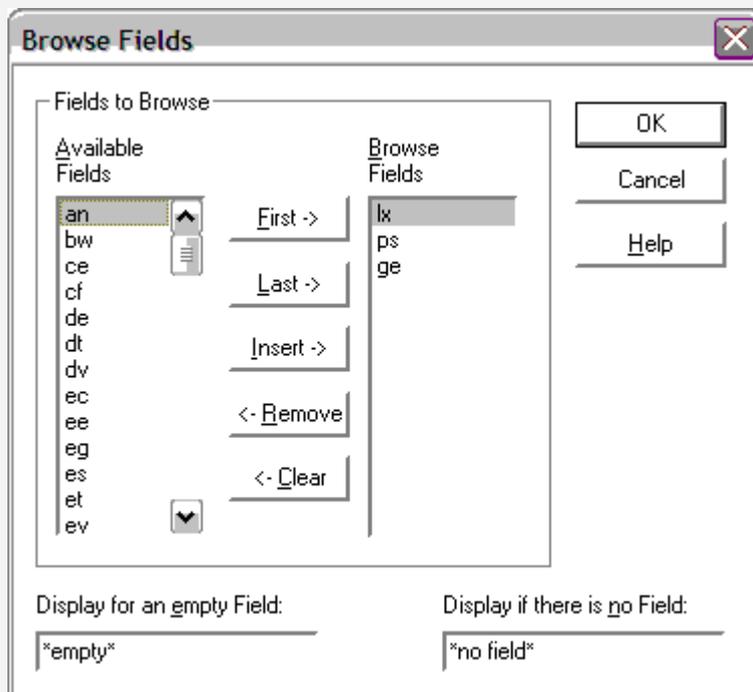
- **Choose View, Both Markers and Names.**

The top line of the Browse view will change to this:

\lx Lexeme	\ps Part of speech	\ge Gloss (E)
------------	--------------------	---------------

- **Choose View, Browse Fields.**

Toolbox will bring up the Browse Fields dialog box.



In this dialog box, you will see two columns of markers. The column on the right is a list of markers for the fields currently being shown in the Browse view, in the order they are shown. (You can compare them to the top of the Browse view.)

The column on the left shows all the available markers which are not being browsed.¹²

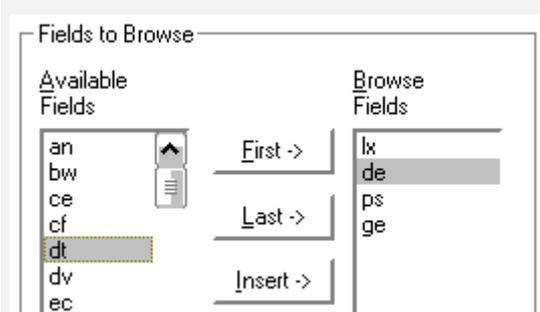
The buttons in the middle are fairly self-descriptive. "Insert" will insert the highlighted marker on the right immediately after the highlighted marker on the left. Each button includes an "arrow" to indicate the direction it will move. "Clear" removes all markers from the list of markers to be browsed.

- **In the left column, choose the marker de (Definition English).**
- **Click Insert.**

¹² There is information on the MDF marker set in the section on Dictionaries.

4.25 Morphological Summary

The de marker will move from the left column to the right column.



Click on OK (or press Enter).

You will see that a new column has been added to the Browse view.

\lx Lexeme	\de Definition (E)	\ps Part of speech	\ge Gloss (E)
abrd	on top of, on board	<i>prep</i>	on
aidano	a semi-polite refusal	<i>part</i>	maybe
byon the pail	*no field*	<i>adj</i>	far_out
clam	*no field*	<i>v</i>	ascend
clum	past tense of 'claw'	<i>n</i>	shellfish
-d	*no field*	<i>vsf</i>	Pst
dat	*no field*	<i>dem</i>	that
de	*no field*	<i>art</i>	the

Because the lines are long, you cannot see the full length of the definition.

- **Adjust the lines so you can see as much of the definition as possible.**¹³
- **Return to normal view.**
- **Return to Browse view.**

Toolbox has remembered where you moved the lines.

Since the definition is somewhat rare (most have just a gloss)¹⁴ you see the "no field" indication fairly often.

- **Sort by the Definition.**

You will notice from the position of the "thumb" on the scroll bar that the entries with content are sorted toward the bottom.

¹³ Move the mouse cursor until the point nearly touches the dividing line between columns. The mouse cursor then becomes a double-headed arrow. Hold down the left mouse button and drag the line to an appropriate place.

¹⁴ The difference between definition and gloss is discussed in the section on Dictionaries.

- Click above the thumb to scroll up one page.

\x Lexeme	\de Definition (E)	\ps F	\ge Glo:
pinky	*no field*	<i>n</i>	finger
shrubby	*no field*	<i>n</i>	tree
stinknat	*no field*	<i>n</i>	mouse
t	*no field*	<i>prep</i>	to
tudeweerz	*no field*	<i>adv</i>	until_ver
tweetr	*no field*	<i>n</i>	bird
wufr	*no field*	<i>n</i>	dog
wussup	*no field*	<i>part</i>	greeting
ya	*no field*	<i>pron</i>	you
yukibug	*no field*	<i>n</i>	insect
z	*no field*	<i>v</i>	be
du nuttin	a greeting	*no fi	*no fi
mumu	a loose flowing dress with a wild print	<i>n</i>	sound_c

You will see that the entries with no de field have been sorted above all those with a de field.

- Edit the entry "yukibug".
- Add a \de field, but don't give it any contents.
- Return to Browse view.

You can see that empty fields are sorted after missing fields.

ya	*no field*	<i>pron</i>	you
z	*no field*	<i>v</i>	be
yukibug	*empty*	<i>n</i>	insect
du nuttin	a greeting	*no fi	*no fi

- Again do View, Browse Fields.

It is also possible to move markers from one column to another by a double click.

- Double click the de marker in the right column.

It will jump back to the left column.

- Using the Last button, place the xe (Example, English) at the end of the list in the right column.
- Remove the ge and ps fields from the right column.
- Add the xv (Example, Vernacular) field so it is after the xe field.
- Click on OK.
- Sort by the Example

4.25 Morphological Summary

The results should be:

\ x Lexeme	\ xe Example free trans. (E)	\ vw Example (v)
-z	*no field*	*no field*
wuf	I'm only kidding.	Aiz jus awufin ya.
katrwallin	That song is driving me crazy.	Dat katrwallin z gitin tummi.
wuf	That was fun.	Dat wur awuf.
wuf	The dog (?) ate three pigs.	De wuf et tree oinkrz.
katnnows	The birds are teasing the cat.	Dem tweetrz r katnnows in de
yukibug	There is an insect on that plan	Derz a yukibug indr flauwy.
pigaut	They ate the food eagerly.	Dey pigdaut n der meetntatz.
pikkat	They barely touched the food	Dey pikkdatt de meetntatz.
katrwal	They were singing half the nigl	Dey uz katrwallin tudeweetrz.
wuf	They quickly ate up the food.	Dey wufd de meetntatz.
heal	He climbed the mountain.	E clum de heal.
grain	He was smiling broadly.	E wuz grainin fm lug t lug.

▪ [Close Toolbox.](#)

3.2. Moving through the Data: Find

3.2.1. The Find Command

In The Basics we examined the Search option. This is an extremely useful feature for locating records. But it has its limitations. The item searched for must be at the beginning of its field, and you must sort by that field. If multiples are found, a list is displayed for you to choose among.

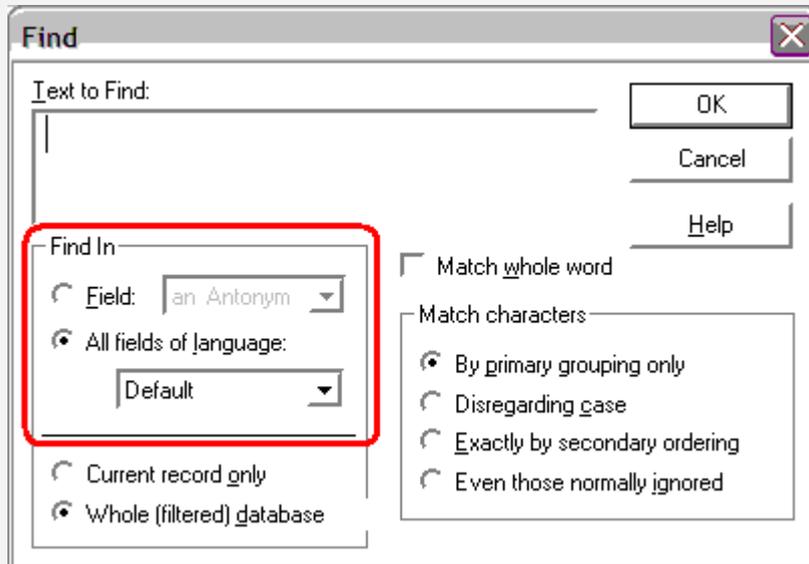
There is also a Find option in Toolbox. This lets you specify data which might occur *anywhere* in an entry – either in a particular field or in a particular language. Find stops at each occurrence of the specified data. When an item is found, Toolbox moves to that record. The search is linear and there is no way to display multiples.

It would be worth your while to go back and review or rerun the Search exercise.

Exercise: The Find Command

- **Open the exercise "1 More Browse".**
- **Choose "Edit" on the menu, and then choose "Find".**

You will see a dialog box like this:



Notice the circled area. One difference between Find and Search is that with Find you must decide if you are searching in a particular field, or if you want all fields of a particular language searched¹⁵.

Each field has a language assigned to it. The marker set we are using is called "MDF". It has four "languages" -- vernacular, national, regional, and English¹⁶. Each marker in MDF uses one of these languages.

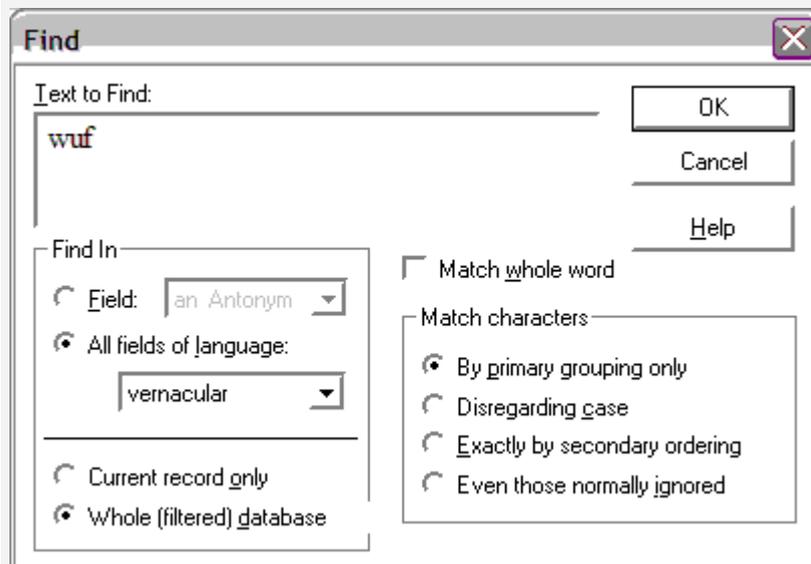
¹⁵ We have not discussed language. That is part of the more advanced set-up process.

¹⁶ In addition there is "phonetic" for the phonetic transcription (\ph) and "date" for the date field (\dt).

4.25 Morphological Summary

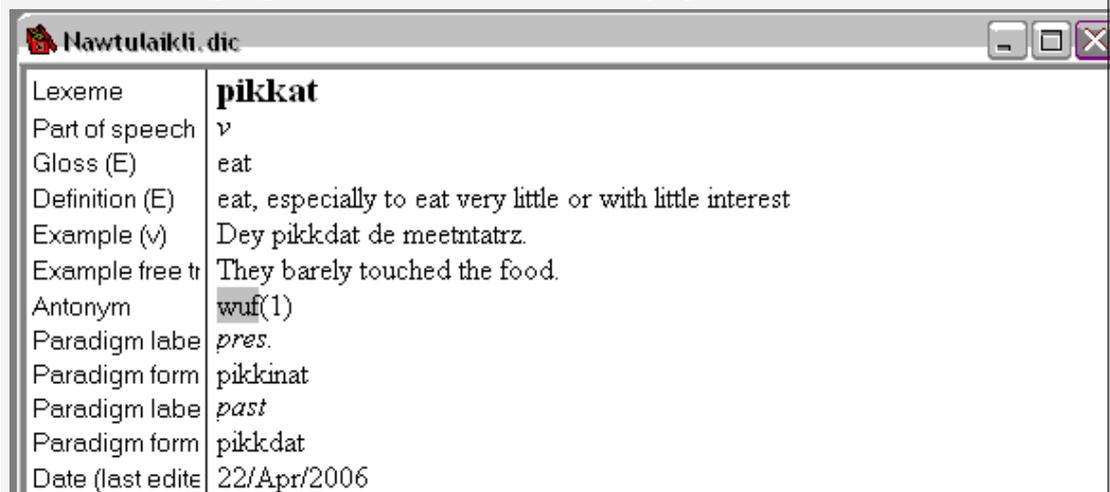
We will search all fields of language "vernacular". This includes lexemes, sub entries, vernacular examples, synonyms, antonyms, cross references, and paradigm forms.

- **Select the language "vernacular" from the language drop list, then fill in "wuf" as the string to find.**



- **Click OK (or Press Enter).**

Toolbox will highlight the word "wuf" in the entry "pikkat".¹⁷



Notice that the toolbar contains three buttons with binoculars and arrows. If you rest your cursor over each of them you will see that they are "Find Previous", "Find" and "Find Next".



- **Click on Find Next.**

Toolbox will go on to the "wuf" entry, and highlight the lexeme.

¹⁷ If Toolbox just beeps and shows you the entry for "abrd", you probably forgot to set the language.

Find Next has a shortcut: F3.

- **Press F3 or click the Find Next button again until the end of the data.**

When Toolbox can find no more it beeps¹⁸, removes the highlight, and places the cursor after the last item it found.

Notice the following:

1) The string "wuf" was found as a word by itself and also at the beginning, middle, and end of longer words.

2) It was not found in the note field in the entry for "wufr" because the language of that field is "English".

- **Click on the Find Previous button.**

The Find Previous button also has a shortcut: Shift+F3

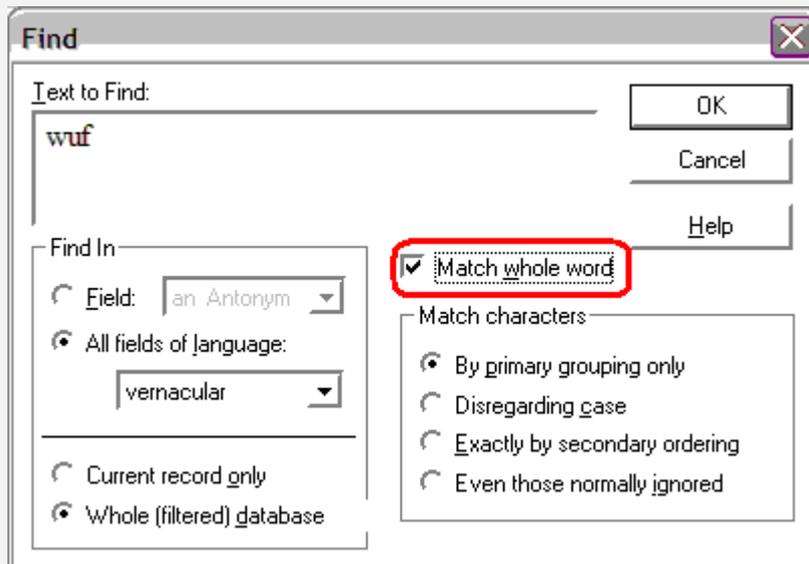
- **Press Shift+F3 or click the Find Previous button again, various times.**

When Toolbox can find no more it beeps, removes the highlight, and places the cursor at the last item it found.

- **Click on the First Record button on the toolbar.**

Now bring up the Find dialog again and change the Find criteria to find only whole words.

- **Click on the Find button.**
- **Check "Match whole word".**



This time when you Find, it will only locate occurrences of the whole word.

- **Exit Toolbox.**

3.2.2. Comparing Search and Find

The following provides a brief comparison of these Search and Find. Though the names are similar and they both locate data, the details are all different.

¹⁸ You may have your sound turned down or muted.

4.25 Morphological Summary

Search	Find
Locates only at the beginning of a field.	Locates anywhere in a field
Locates only in the field sorted by.	Any sorting is possible, but it is best to sort by the first field of the entry. ¹⁹
Searches the entire database.	Hunts through the data only from the cursor forward (or back). Can be restricted to look within a single record.
Displays a list when it matches more than one item.	Travels linearly through the data, displaying matches as it comes to them.
Gives the option to match the whole <i>field</i> .	Gives the option to match the whole <i>word</i> .

3.3. Making Data Stand Out (Using Color)

There are numerous ways to customize Toolbox. One way is to color-code the different languages. This is especially helpful when working with a single script. (When I say color, I am also including enhancements like bold and italic.)

The MDF marker set recognizes four main "languages": vernacular, national, regional, and English. Most of the MDF markers are categorized to have one or the other of these languages. There is also "phonetic" for the phonetic (\ph) field and "date" for the date (\dt) field.

The Nawtulaikli Dictionary uses only English and vernacular. We will make these different. We will also see how to change the color of an individual field.

¹⁹ In section 2.12.3 *above A Point of Confusion: Multiple "Entries" in Browse* (above) you learned that when sorting by gloss (for example), you can see apparent multiple entries in the Browse view where there is in fact only a single entry. Find sees these false multiple entries also and may show you the same string in the same entry multiple times. This does not happen when sorting by the first field since it occurs only once in a record.

3.3.1. Changing the Appearance of a Language

Exercise: Changing the Appearance of a Language

- Open the exercise in the folder "2 Color".

The project will open to the entry "wuf".

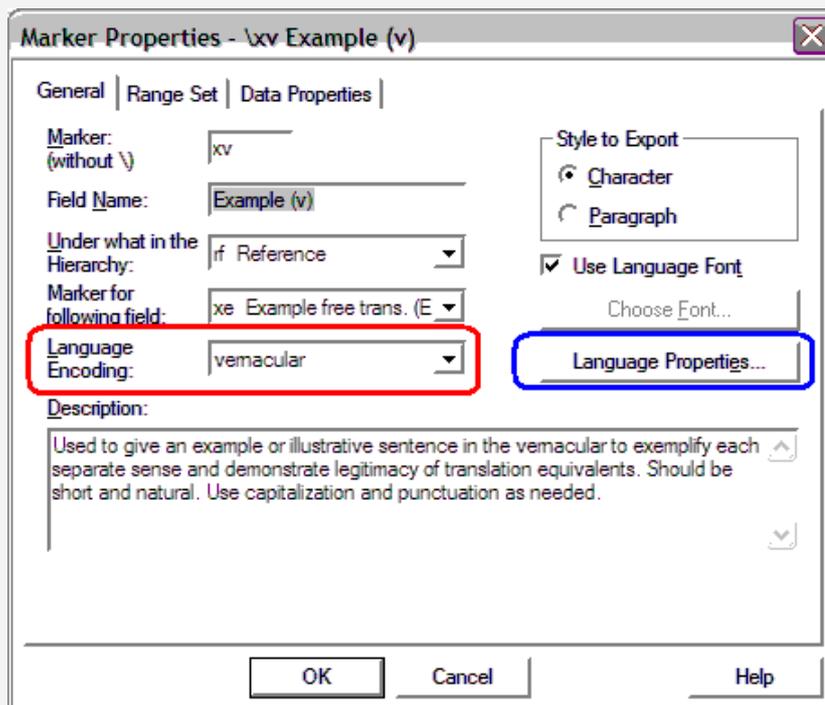
It is difficult to tell, without reading the data, whether a field is English or Nawtulaikli.

- Do a right click on the \xv Example (v) Field Name.

\lx Lexeme	wuf
\ps Part of speech	v
\sn Sense number	1
\ge Gloss (E)	eat, especially to eat rapidly
\xv Example (v)	Dey wufd de meetnatrz.
\xe Example free trans. (E)	They quickly ate up the food.

This will bring up the large Marker Properties dialog box.

First, notice that the vernacular "Language Encoding" is specified for the marker. The Language Encoding is essentially the language, or, more particularly, it is the script. It includes the alphabetical order for sorting as well as information about the font and keyboard. Each marker is told which language encoding information to use.

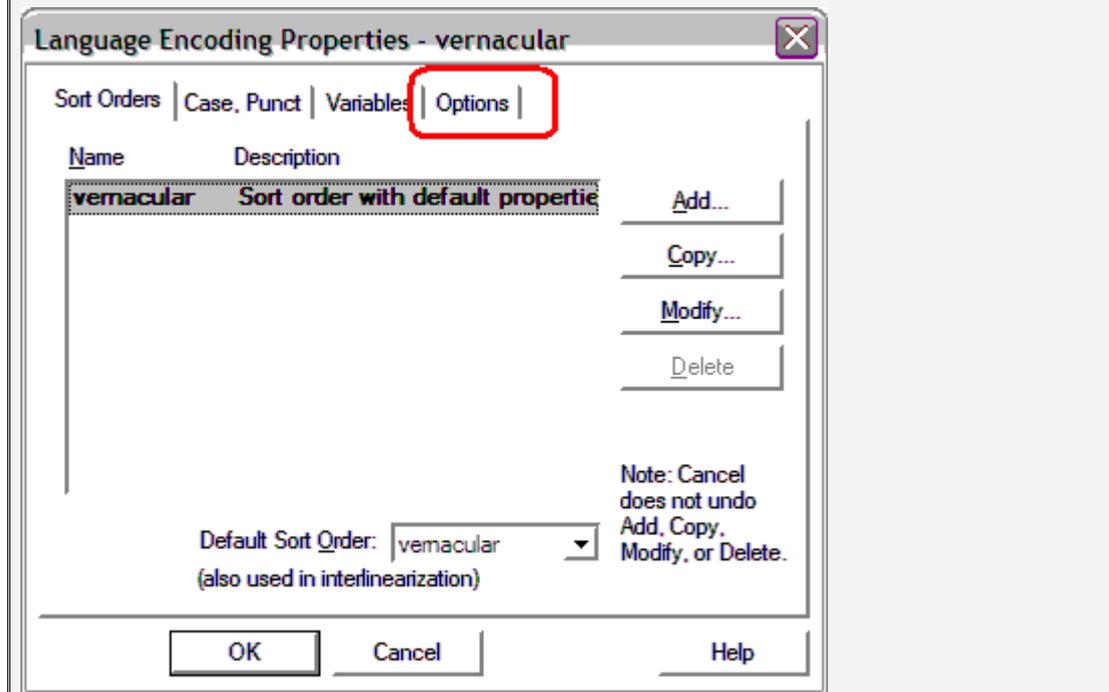


To the right of the Language Encoding is a button labelled "Language Properties".

4.25 Morphological Summary

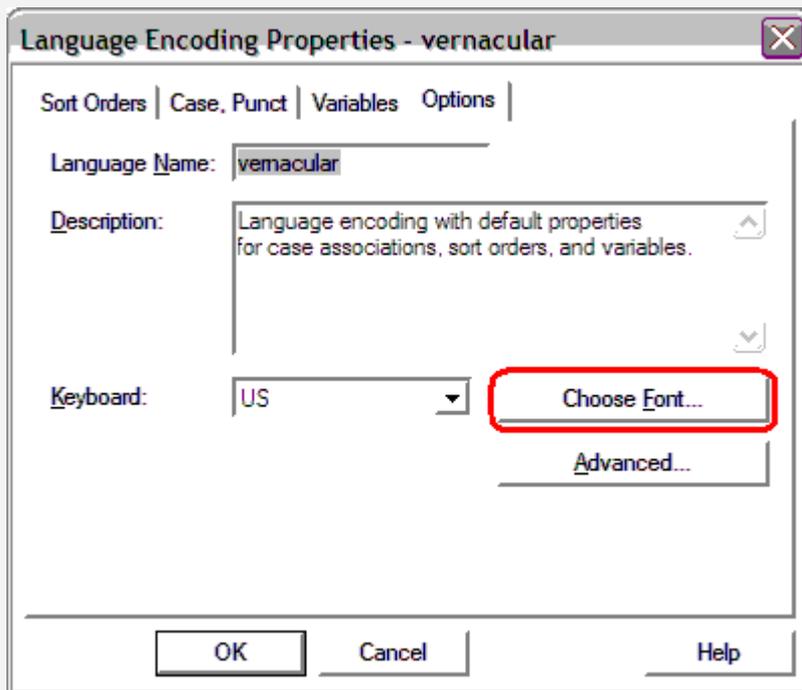
- **Click on the Language Properties button.**

Toolbox will bring up another complex dialog box with four tabs.²⁰



²⁰ Most of the information in this dialog box will be covered in the advanced section since setting up a proper language encoding is something usually done by consultants.

- **Click on the Options tab.**

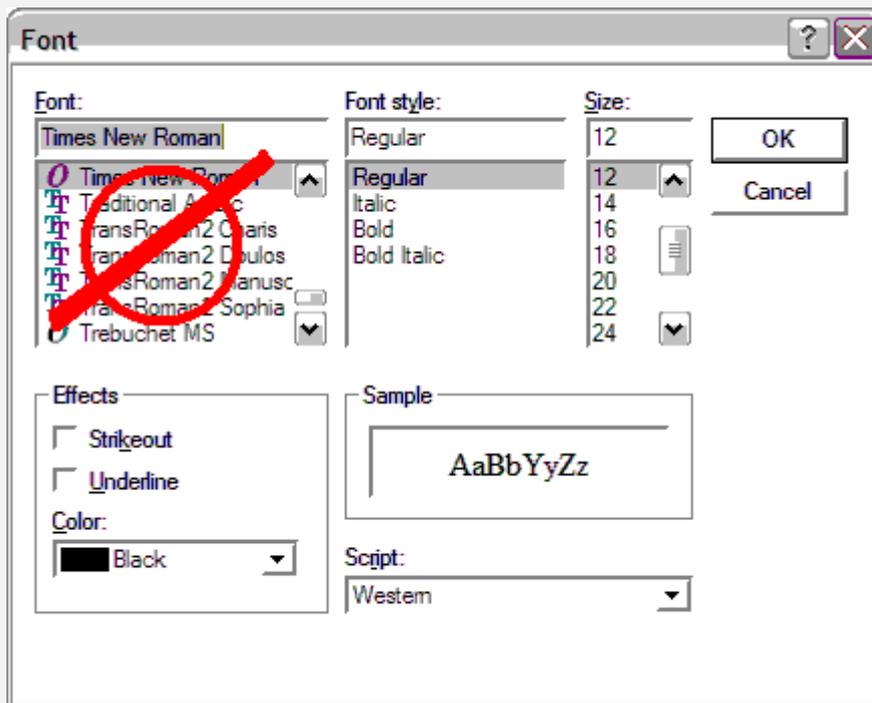


- **Click on the Choose Font button.**

This will bring up a standard dialog box for specifying a font.

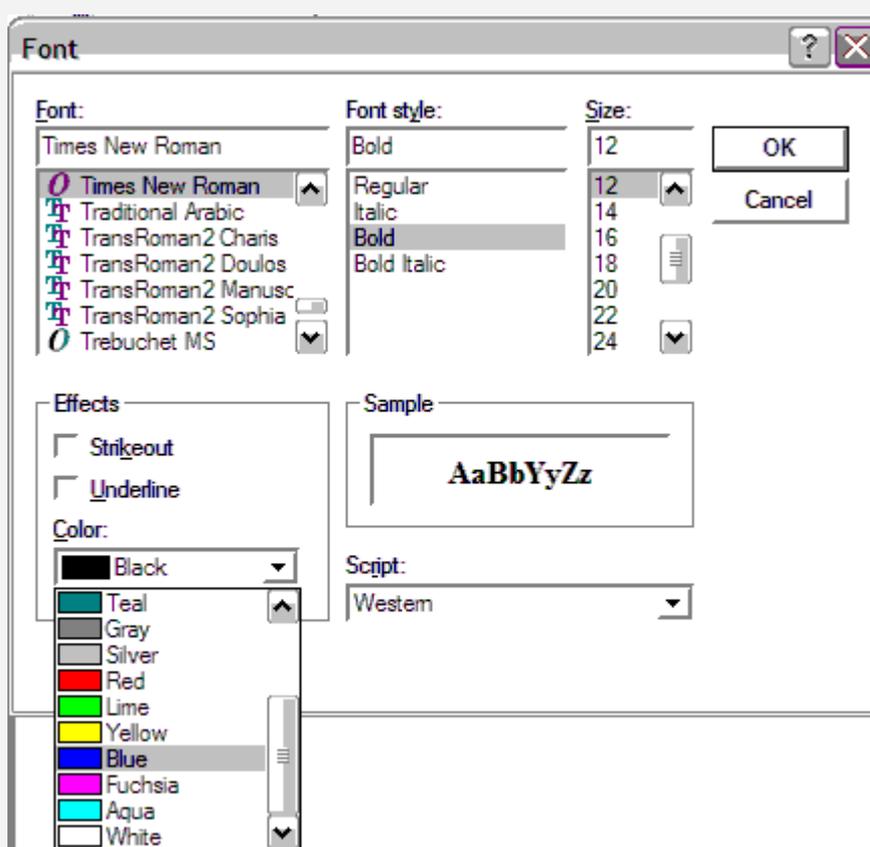
In general, you should not change the font. If you are using a "legacy" font, it is often the case that incompatible legacy fonts are available and the keyboard may not work correctly with the wrong font and your data may look like junk. If you are using a Unicode font, unfortunately not all necessary characters are available with all Unicode fonts. So check with a local consultant to be sure before changing the actual font.

What you *may* change freely is the size, the style, and the color.



4.25 Morphological Summary

- Choose the color Blue and bold.



- Click on OK until you are back to the regular Toolbox window.

The data will look like this:



This may be a bit too much blue. For me, I find few colors give contrast without getting gaudy. Even so, some color change can be very helpful.

Notice that even though the lexeme is vernacular, it did not change color. We will look at this in the next exercise.

- **Right click again on the Example (v) field.**
- **Move the dialog box so that you can see at least part of the text that will change color.**

The other dialog boxes will open on top of the Marker Properties dialog box, leaving you still with a view of the data. The color change happens when you click OK from the Font dialog box. So you can save several steps as you experiment.

- **Now experiment a bit with different colors, bold, italics, even underlined.**
- **Exit Toolbox.**

3.3.2. Changing the Appearance of a Single Field

Another approach to color changes is to color the structural elements such as the Part of Speech, Sense Number, and Sub Entries. Some people also like to have the lexeme different.

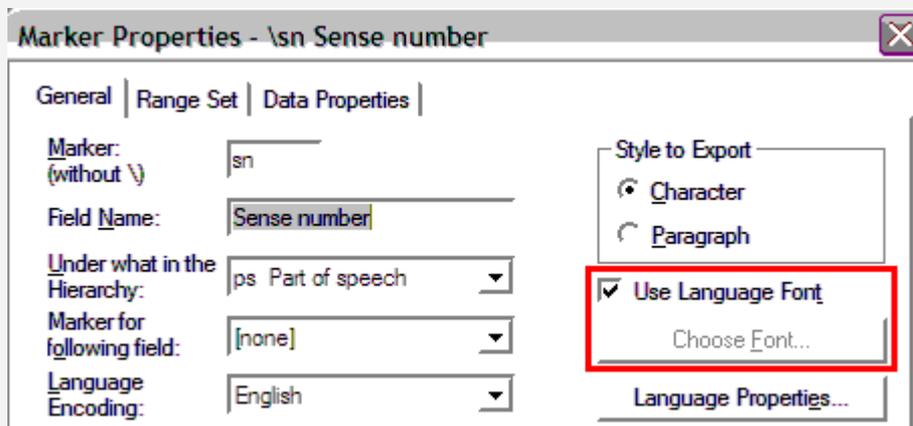
Exercise: Changing the Appearance of a Single Field

- **Open the exercise in the folder "2 Color".**

The project will open to the entry "wuf".

- **Right click on the \sn Sense Number Field Name.**

Toolbox will bring up the Marker Properties dialog box. This time notice the Use Language Font check box above the Language Properties button.



- **Un-check the Use Language Font.**

Toolbox will un-grey the Choose Font button, indicating it is available for use.

- **Click on the Choose Font button.**

Toolbox will display the standard font selection dialog box.

Again, it is best not to change the font itself, but other features may be changed.

- **Choose Red and Bold.**

Notice that the numbers are now quite noticeable. But since they are small and few, they aren't overwhelming.

4.25 Morphological Summary

- **Right-click the \ps Part of Speech field name.**

Notice that the Use Language Font check box is already unchecked. As you may recall, the part of speech is in italics.

- **Click on the Change Font button.**
- **Choose Blue and bold and 14 point.**

If you right-click on the Lexeme's Field Name you will notice that it has also been changed. That is why it didn't change color when the vernacular language was changed in the previous example.

- **Search for the "du nuttin" entry.**
- **Change the subentries to be underlined.**

Feel free to experiment with other variations.

- **Exit Toolbox.**

3.4. Filters

A filter reduces the amount of data visible to you. By reducing the "clutter", it is sometimes easier to examine the data and do certain types of analysis. It is possible to create very complex filters in Toolbox. However, for most activities, a very simple filter is all that's needed. This section illustrates filters and how to create a simple one.

3.4.1. Using a Filter

Exercise: Using a Filter

- **Open the exercise in the folder "3 Filters".**

The exercise opens to the entry "der", which contains a general Note field.

Lexeme	der
Part of speech	<i>art</i>
Gloss (E)	the
Notes (general)	What is the difference between 'de' and 'der'?

Before anything else, look down at the Status Bar. Somewhere toward the right end of the status bar is a pair of numbers with a slash between. You should see 10/54. This is saying that there are 54 records and that "der" is the 10th. (The reason for observing this will become apparent below.)

Using Next Record, try to locate the next occurrence of a Note. (Don't try too long.)

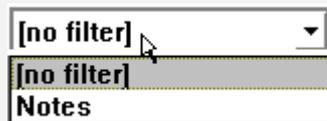
Even in this small set of data, it can be difficult to locate a specific but fairly rare item. In this case, there are only 5 general Notes, and the next one is the record "t", some 35 records away.

In this type of circumstance, a filter can be useful.

On the toolbar, at the right end there is a box that says "[no filter]".



This box displays the name of the active filter. A click in the box will cause the list of filters to drop down. (You don't have to click on the drop arrow, just click on the word "no filter".)



- **Drop the filter list by clicking on "no filter".**
- **Select the filter "Notes".**

The screen will once again show you the record "der".²¹

- **Now look at the number on the Status Bar.**

It should show you 1/5. This is saying that there are five records containing the Notes field, and "der" is the first.

²¹ If you clicked to nearly the end of the database, past record 45, then you may be seeing some other record. If so, click on "First Record" and it will take you to the "der" record.

- **Click through the five records, looking for the Notes field in each.**

This is easy except for the record "wuf". Did you see all three? Let's make it easier to find such fields by changing the color of the Notes field.

- **Go to any record besides "wuf".**

(The notes are easier to find here.)

- **Change the color of the Note field to bold and red.²²**

- **Go to the "wuf" record.**

- **Now scroll down and notice the Notes.**

They are much more visible. It is often useful to combine a Filter and a change of color.

- **Close Toolbox.**

3.4.2. Writing a Filter for a Marker

As mentioned above, it is possible to write quite complex filters. However, simple filters are simple to write and most of the time that's all you will want. The following illustrates one of the most common types of filter, a filter for a marker.

Exercise: Writing a Filter for a Marker

- **Open the exercise in the folder "3 Filters".**

We will create a filter to look for occurrences of the Anthropology Notes field. This is another instance where we need to know the markers themselves.

- **Do View, Both Markers and Names.**

- **Now Search for "wuf".**

At the end of this entry is a Notes (antropology) field. You can see the marker is \na.

- **Do Database, Filtering.**

Toolbox will bring up the Filtering tab of the Database Properties dialog box. You will see the Notes filter listed.

- **Click on Add.**

Toolbox will bring up the Filter Properties dialog box. The cursor is in the Filter Name edit box. You can name the filter "Anthro Notes" or just "\na". (Always do the name immediately. It's too easy to forget, and then you get an error message...)

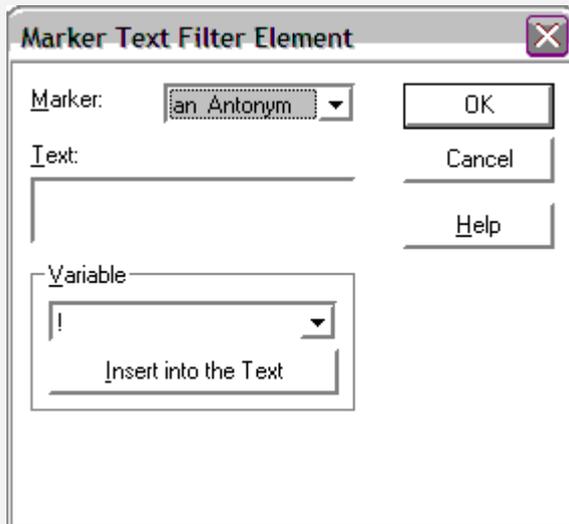
- **Type an appropriate name for the filter.**

The Marker Text Filter Element is already highlighted. It is the element we want. It lets us search for a marker or for a marker plus text.

²² Right click on the Notes (general) Field Name. Un-check "Use Language Font". Click on "Choose Font". Choose Red and Bold and click OK twice.

- **Click on First or Insert.**

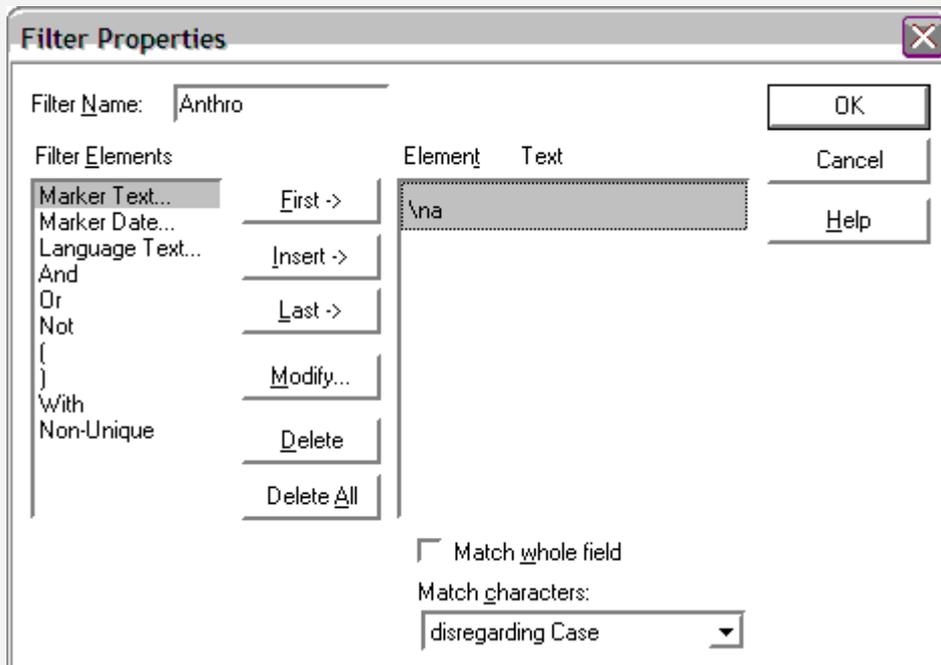
Toolbox will bring up the Filter Element dialog box.



The focus is on the Marker drop list.

- **Type "na"²³ or scroll down the list to the na Notes (anthropology) field.**
- **Click OK.**

The box in the middle should now display the filter element, just \na.



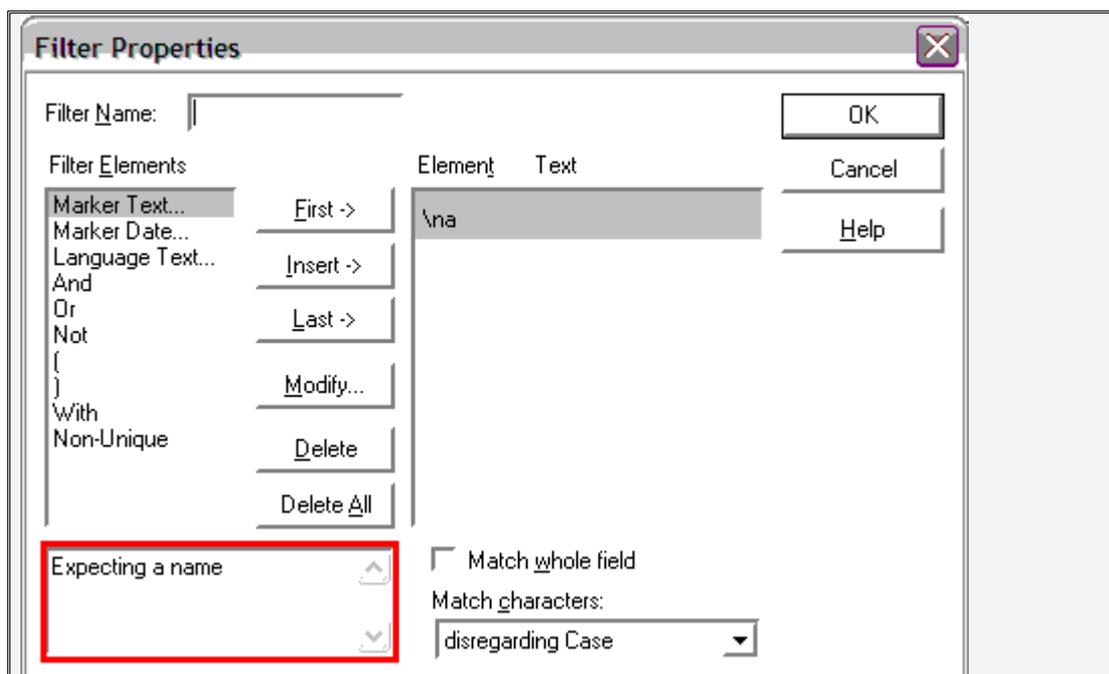
- **Click OK.**

You will now see the filter in the list of filters.

Note: if there is an error, the error message will appear in the lower left corner of the dialog box. There will not be a separate box with the message. This can be hard to notice. For example:

²³ If you make a mistake and type the wrong first letter, you have to hit "Backspace" to erase the error, even though you can't see it, or you can scroll the list when it starts beeping at you.

4.25 Morphological Summary



The two most common errors are (1) not giving a name and (2) typing an Enter after the name, which Toolbox interprets as an OK. In this second case the error message is "Expecting a filter element."

- **Click OK again to return to the main Toolbox window.**
- **Now click on the "[no filter]" in the active filter window on the toolbar.**
- **Select the filter you just made.**

Check the number on the Status Bar. It should show two records containing the \na field.

- **Close Toolbox.**

3.4.3. Writing a Filter for Marker and Text

The next most common type of filter is to specify a marker and some text.

Exercise: Writing a Filter for a Marker and Text

- **Open the exercise in the folder "3 Filters".**

We will create a filter to look for occurrences of the word "de" in the Example sentence field. This is another instance where we need to know the markers themselves.

- **Do View, Both Markers and Names.**
- **Now Search for "wuf".**

Near the top of this entry is an example sentence. You can see that the marker is \xv.

- **Do Database, Filtering.**

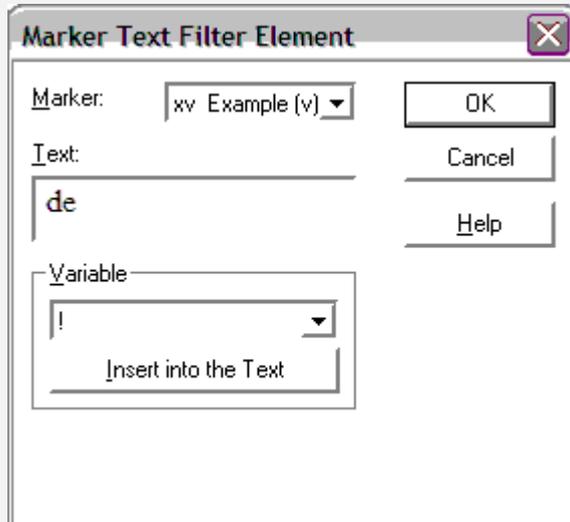
Toolbox will bring up the Filtering tab of the Database Properties dialog box. You will see the Notes filter listed.

- **Click on Add.**

Toolbox will bring up the Filter Properties dialog box.

- **Fill in the name "De examples".**
- **Click on Insert.**
- **Choose the Marker \xv Example (v).**
- **Now put your cursor in the Text box and type "de".**

The dialog box should look like the following:



Click on OK until you are back to the regular Toolbox window.

- **Select the "De examples" filter from the active filter list.**

The Status Bar should indicate that you are in record 6 of 7 records which match the filter.

- **Click on First Record.**

The first record of the filtered set is "heal".

- **Change the color of the \xv field to red to make it stand out.²⁴**

²⁴ Right click on the marker, un-check Use Language Font, click on Choose Font, select the color.

- **Click through the data using Next Record and look at the example sentences.**

You will notice that some sentences contain "dey" or "der" but not "de". Obviously we need to restrict the filter to whole words. However, there is no "whole" word option in the Filter dialog box, only "Match whole field", which would be useless for this example.

- **Do a *right* click on the active filter box, where it says "De examples".**

This will bring up the Filter Properties dialog box for the "De examples" filter. There is no way to add a new filter from here but you can modify the active filter.

- **Click on Modify.**
- **Click on the Help button.**

This will bring up a help topic describing the Marker Text filter element. Probably the most helpful part of this topic is the list of examples. Notice the fourth example of searching for the *word* "man". It shows the use of the Word Boundary variable, [#].

- **Click in the Text box and modify it to be "[#]de[#]" (without the quotes!).**
- **Click OK until you are back to the main Toolbox window.**

Note that now the Status Bar indicates only four records match.

- **Examine the data and observe that now only records containing at least one example with the word "de" are included.**
- **Close the Help File.**
- **Close Toolbox.**

3.4.4. Using Browse or Find Instead of a Filter

Even though filters are not terribly difficult, some people find them confusing. Plus there is always the potential confusion of not realizing a filter is active and thinking that data does not exist that is actually available when not filtering.

Even if you aren't confused by filters, it's often simpler to use Browse or Find than to create a filter.

An alternative to filtering by a Marker is to Browse on the marker, then sort by the marker to be sure that you are viewing all instances of the marker. You can switch to normal view at any point to see the full context of a particular marker.

An alternative to filtering by a Marker and Text is to Find on that particular field and locate that text. This even has an advantage over the Filter in that Find highlights the very text you are looking for!

Chapter 4: Interlinear Text

4.1. Introduction to Interlinear Text

Linguists often make interlinear text, text with an analysis and gloss under each word. Toolbox makes it easy to produce interlinear text. Toolbox uses the dictionary to parse each word into morphemes, and it puts a part of speech and gloss under each morpheme.

Exercise: Interlinear Text Sample

Interlinear exercises are in the folder “Exercises\Interlinear”.

- **Open the project in the folder “1 Interlinear Text Sample”.**

You will see a sample text in Frisian (from a grammar by Pieter Mijes Tiersma).

Reference Lake.001

Text Fryslân yn maitiidpracht, wylst de sinne skynde

Morphemes Fryslân yn maitiid - pracht wylst de sinne skyn -de

Gloss Friesland in spring - splendor while the sun shine -Pst

Part of Speech n prep n - n conj det n v -tns

Text oer de marren en de wide greiden mei fee.

Morphemes oer de mar -en en de wide greid -en mei fee

Gloss over the lake -PI and the wide pasture -PI with cattle

Part of Speech prep det n -num conj det adj n -num prep n

Free Translation Friesland in the glory of springtime, when the sun shone over the lakes and the wide pastures filled with cattle.

vid Lake ref Lake.001 4/11

- **When you are finished looking at the example, close Toolbox.**

Toolbox normally formats interlinear text as shown above, but other layouts are possible.

The first line below the text shows each word divided into morphemes. The second line gives a gloss of each morpheme, and the third line gives a part of speech for each morpheme. For example, the word “greiden” is divided into the noun root “greid” and the plural number affix “-en”.

Interlinear text is broken into referenced units. Each unit has a reference number and a free translation. A unit may be a complete sentence or only a clause or phrase. As shown in the sample, a unit may have multiple lines of interlinear text.

A reference consists of a short abbreviation of the name of the text, followed by a dot and a unit number. For example, in the text above, “Lake” is the abbreviated text name, and “001” is the unit number, giving “Lake.001” as the complete reference. Toolbox can add references to new texts to prepare them for interlinearization.

4.2. Interlinearizing Text

Annotations are added to text by interlinearizing the text. Interlinearization uses a dictionary to parse each word into morphemes, and to find the gloss and part of speech of each morpheme.

Exercise: Introduction to Interlinearizing

- **Open the project in the folder “2 Introduction to Interlinearizing”.**

You will see the above text with references, but no interlinearization.

Frisian.txt	
Identifier	Homeland Story
Reference	Lake.001
Text	Fryslân yn maitiidpracht, wylst de sinne skynde oer de marren en de wide greiden mei fee.
Free Translation	Friesland in the glory of springtime, when the sun shone over the lakes and the wide pastures filled with cattle.
Reference	Lake.002
Text	Noarwegen, doe't de hege sinne dreamde yn 'e fjorden.
Free Translation	Norway, where the sun shone dreamily over the fjords.
Reference	Lake.003
Text	Heite en Memme lân.
Free Translation	It was his father's and mother's homeland.

To add interlinear lines to a text, you use the “Interlinearize” command. There is an interlinearize button:



(Note that the interlinearize button looks somewhat like the browse button. The interlinearize button is to the left of the browse button.)

- **Click on the Interlinearize button.**

You will see the first sentence interlinearized. The result will look like the sample in the previous exercise. After interlinearization, the text has been wrapped to fit the width of the window.

The Interlinearize command only does one unit.

- **Use the scroll bar to scroll the text up.**

You will see that the second and third sentences have not yet been interlinearized.

After interlinearizing the first sentence, the cursor stopped at the end of the sentence so that you can review the result. The next time you interlinearize, it will move forward to the next text unit.

- **Click on the Interlinearize button again.**

You will see the second sentence interlinearized.

- **Click on the Interlinearize button again.**

You will see the third sentence interlinearized.

- **When you are finished looking at the example, close Toolbox.**

4.3. Preparing a Text for Interlinearization

The best way to get text into Toolbox is to type it directly in Toolbox. You break it into referenced units as you type it. You enter the free translation of each unit after it. To enter text that way, set the next field of \ref to \tx, the next field of \tx to \ft, and the next field of \ft to \ref. That way the next marker will automatically be added whenever you press Enter.

But you may have a text that has been typed in some other program, and it may not be broken into reference units. In that case, you can paste the text into a Toolbox text field, and Toolbox can help you break it into referenced units. Toolbox does this with the “Break/Number Text” command.

The next set of exercises use a made-up language called “Amadup”. We will start with the text of a famous Amadup fable.

Exercise: Preparing a Text for Interlinearization

- **Open the project in the folder “3 Preparing a Text for Interlinearization”.**

You will see an Amadup text and its free translation. In order to illustrate text breaking and numbering, this text has been entered into Toolbox without being broken into referenced units.

Texts.txt	
Identification	Frog Meets Fish
Text	Todn lyfch nyr velgoi. Lyfch tap plap joygoi. Lyfch tap plapgonso. Din todn jlyj lyfch blo wiglo bzervegonsi. Don jlyn dij todj tap bzervegonso. Din todn doj jlyj blo bzervegonsi. Din todn sezgonsi, "Detn klimen blo doshusetn eh?" Don jlyn sezgonso, "Dukyetch! Dukyetch joyme!"
Free Translation	Long ago a frog lived by a lily pad. He liked to sit on the lily pad. One day he was sitting on the lily pad. The frog saw a fish swimming under the lily pad. The fish looked up at the frog. The frog looked down at the fish. The frog said, "How is the weather down there?" (Lit. Is the weather good down there?) The fish said, "Wet, just the way I like it!"

4.25 Morphological Summary

- **Choose Tools, Break/Number Text.**

You will see a dialog box with options:

Break and Number Text

Apply to:

Current Record: Frog Meets Fish

Whole Database

Options:

Text-break Punctuation: .!?

Fields to be included when breaking text:

tx Text

Select Fields...

Name of Text:

Use Contents of Field: id Identification

Use this Name:

Starting Number: 001

Reference Marker: ref

Text Marker: tx

OK

Cancel

Help

Most of the default options are correct. You want to do the current record. You want the text to break at sentence ending punctuation marks. The starting number and the reference and text markers are correct.

But you do not want to use the contents of the identification field. The text name must be a short abbreviation, and it must not contain spaces. So we will enter a text name.

- **Click on “Use this Name”.**

- **Enter a name of “Fish”.**

The result should be:

Name of Text:

Use Contents of Field: id Identification

Use this Name: Fish

- **Click OK.**

The text will change to a series of referenced units.

Identification	Frog Meets Fish
Reference	Fish.001
Text	To ^{dn} lyfch nyr velgoi.
Reference	Fish.002
Text	Lyfch tap plap joygoi.
Reference	Fish.003
Text	Lyfch tap plapgon ^{si} .
Reference	Fish.004
Text	Din to ^{dn} jlyj lyfch blo wiglo bzerveg ^{on} si.
Reference	Fish.005
Text	Don jlyn dij to ^{dj} tap bzerveg ^{on} so.
Reference	Fish.006

- **Scroll down to the end of the text.**

You will see that the text has been broken at each period, question mark, and exclamation mark.

- **Close Toolbox.**

4.4. Renumbering Interlinear Text

It is easy to adjust the text breaks if they are not where you want them. After you delete or add references, Toolbox can put the reference numbers back into sequence. This is done by choosing Tools, Renumber Text.

Exercise: Renumbering Interlinear Text

- **Open the project in the folder “4 Renumbering Interlinear Text”.**

You will see the last few sentences of the text that was numbered above.

Reference	Fish.007
Text	Din todn sezgoni, "Detn klimen blo doshusetn eh?"
Reference	Fish.008
Text	Don jlyn sezgonso, "Dukyetch!"
Reference	Fish.009
Text	Dukyetch joyme!"

We want to change the breaks in these text units. The break between Fish.008 and Fish.009 is not in a good place. We want to make the quoted section a single unit. We also want to make each quoted section a unit by itself.

First we will break Fish.007 at the beginning of the quoted section.

- **Place the cursor before the quote mark before “Detn”.**
- **Press Enter to break the line.**
- **Type “\tx” and press Enter.**

The result is to break Fish.007 into two text fields.

Reference	Fish.007
Text	Din todn sezgoni,
Text	"Detn klimen blo doshusetn eh?"

Next we need to insert a new reference field between the two text fields.

- **Place the cursor at the end of the text field that ends with “sezgoni”.**
- **Choose Edit, Insert Field.**
- **Type “ref” and press Enter.**

The result is a new empty reference field.

Reference	Fish.007
Text	Din todn sezgoni,
Reference	
Text	"Detn klimen blo doshusetn eh?"

There is no need to put anything in the reference field, because Toolbox renumbering will fill it in.

The other adjustment is to combine the two parts of the quote in Fish.008 and Fish.009.

- **Select “Dukyetch!”, including the preceding quote.**
- **Press Ctrl+X to cut.**
- **Move the cursor to before “Dukyetch” in Fish.009.**
- **Press Ctrl+V to paste.**
- **Type one space.**

The result is to put the quoted section together:

Reference	Fish.008
Text	Don jlyn sezgonso,
Reference	Fish.009
Text	"Dukyetch! Dukyetch joyme!"

Now we are ready to fix the numbering.

- **Choose Tools, Renumber Text.**

You will see a dialog box with renumbering options.

These options are what we want.

- **Click on OK.**

You will see the reference numbers change to correct numeric sequence. The empty reference field is filled in, and the following fields have higher numbers than before.

Reference	Fish.007
Text	Din todn sezgonso,
Reference	Fish.008
Text	"Detn klimen blo doshusetn eh?"
Reference	Fish.009
Text	Don jlyn sezgonso,
Reference	Fish.010
Text	"Dukyetch! Dukyetch joyme!"

- **Close Toolbox.**

4.5. Adding Free Translation

After breaking and numbering a text, a free translation is added to each referenced unit. There is no easy automatic way to interleave a free translation into a text. If the free translation has already been typed into some other program, you will probably want to copy and paste the appropriate piece under each referenced text unit.

The best way to enter free translation is to type it directly into Toolbox. You can type the free translation interleaved with the text, either as you type the text or later. One thing that saves time is to set the “next field” of the Text field to Free Translation. That way when you press Enter at the end of a text line, an empty free translation field will be inserted automatically.

4.6. Starting Interlinearization

The normal sequence in your real project is that you will start by collecting words and entering them into your dictionary. At some later time you will begin collecting texts and interlinearizing them. As you interlinearize a text, some of the words will already be in your dictionary. But many of the words will be new ones that have to be added to your dictionary. Toolbox shows you which words are already in the dictionary, and which are not. It helps you to quickly add new words to your dictionary.

A text will also contain many words that have affixes. If your dictionary contains both the root and the affixes of a word, Toolbox will parse the word into morphemes. But in the early stages of interlinearization, your dictionary will not contain all of the affixes, so some words whose roots are already in your dictionary will fail to parse because not all of their affixes are in the dictionary. For words like that, Toolbox shows you the root that it has found in the dictionary, to help you add the necessary affixes.

In your real project, you will have to think about how you decide what meaning to give to each morpheme. In later lessons I will discuss ways Toolbox can help you do that in situations where you don't have access to a speaker of the language. But in this first series of lessons, I will give you the kind of information you could probably get from a good bilingual Amadup-English speaker.

As you interlinearize a text, you will interlinearize a sentence, then add to the dictionary all roots and affixes that are needed to make all the words in the sentence parse. Usually you will try to make all of the words in each sentence parse before you go on to the next sentence. However, if you aren't sure of the meaning of a word, you can leave it and go on to further text. You can easily come back to such failed words after you get more information.

Exercise: Starting Interlinearization

- **Open the project in the folder “5 Starting Interlinearization”.**

You will see the Amadup text that was numbered above, with the free translation interleaved.

The screenshot shows the Toolbox software interface. The main window, titled 'Texts.txt', displays a list of text entries. The first entry is 'Frog Meets Fish' with reference 'Fish.001'. The text is 'Todn lyfch nyr velgoi.' and the free translation is 'Long ago a frog lived by a lily pad.' The second entry is 'Fish.002' with text 'Lyfch tap plap joygoi.' and free translation 'He liked to sit on the lily pad.' Below the main window is a smaller window titled 'Dictionary.txt' which is currently empty. The status bar at the bottom shows the current entry is 'Frog Meets Fish' with reference 'Fish.001' and page number '2/11'.

Identification	Frog Meets Fish
Reference	Fish.001
Text	Todn lyfch nyr velgoi.
Free Translation	Long ago a frog lived by a lily pad.
Reference	Fish.002
Text	Lyfch tap plap joygoi.
Free Translation	He liked to sit on the lily pad.

Lexeme	Part of Speech	Gloss English

id Frog Meets Fish ref Fish.001 2/11

You will also see a dictionary with an empty entry. Typically you will have entered some words in your dictionary before you start interlinearizing, but in this example, we are starting with a completely empty dictionary.

- **Click on the Interlinearize button.**



You will see the first sentence interlinearized, with all the words shown as failures.

Reference	Fish.001
Text	Todn lyfch nyr velgoi.
Morpheme Breaks	*Todn *lyfch *nyr *velgoi
Gloss English	*** *** *** ***
Part of Speech	*** *** *** ***

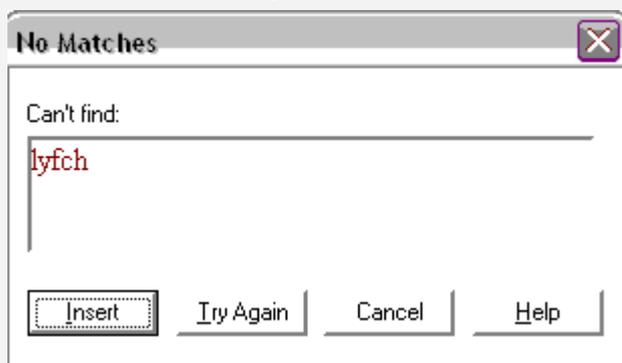
Each word in the morpheme breaks line has an asterisk in front of it to say that it failed to parse.

4.25 Morphological Summary

The Amadup speaker tells you that the word “lyfch” means lily pad.

- **Right click on “*lyfch” in the Morpheme Breaks field.**

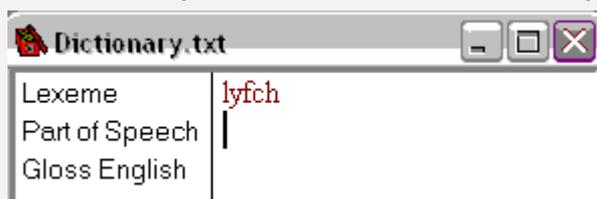
You will see a dialog box titled “No Matches”.



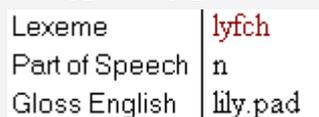
This means that the word was not found in the dictionary. The dialog box defaults to inserting the word in the dictionary. (If you made a mistake and clicked on “lyfch” in the Text field, you will see a different dialog box that has only an “OK” button. If you see that, click OK, and try again.)

- **Press Enter.**

The dictionary window will show a new entry for “lyfch”.



- **Type “n” as the part of speech.**
- **Press down arrow to move to the gloss field.**
- **Type “lily.pad” as the gloss.**



Using a dot or underscore to connect the two words of a multi-word gloss is common practice in interlinearized text.

- **Click on the word “lyfch” in the text window.**
- **Click on the Interlinearize button.**

The gloss and part of speech will be filled in for “lyfch”.

Reference	Fish.001
Text	Todn lyfch nyr velgoi.
Morpheme Breaks	*Todn lyfch *nyr *velgoi
Gloss English	*** lily.pad *** ***
Part of Speech	*** n *** ***

- **Close Toolbox.**

4.7. Return from Jump in Interlinearization

One powerful shortcut for interlinearization is the “Return from Jump” command. Return from jump goes back to the starting place of the last jump. This means that after jump has been used to insert a new word in the dictionary, return from jump goes back to the word in the text. An additional action of return from jump is that if the jump was from interlinear text, then the text word is automatically interlinearized. This updates its parse to reflect the new entry in the dictionary. So, return from jump is the equivalent of clicking on the word in the text window and doing interlinearize.

Return from jump is on the Edit menu, but you will use it so often that you should memorize its shortcut key, Ctrl+R. (Do not confuse this with Alt+R, which turns on browse view. If you accidentally turn on browse view when you meant to return from jump, just press Alt+R once more to turn browse view off again.)

Exercise: Return from Jump in Interlinearization

- **Open the project in the folder “6 Return from Jump in Interlinearization”.**

You will see the Amadup interlinear text as it was at the end of the last exercise.

Reference	Fish.001
Text	Todn lyfch nyr velgoi.
Morpheme Breaks	*Todn lyfch *nyr *velgoi
Gloss English	*** lily.pad *** ***
Part of Speech	*** n *** ***
Free Translation	Long ago a frog lived by a lily pad.

The Amadup speaker tells you that the word “nyr” means “by”. You notice that it occurs after lily pad, so you conclude it is a postposition.

- **Right click on “*nyr” in the Morpheme Breaks field.**

You will see a dialog box titled “No Matches”.

- **Press Enter.**

The dictionary window will show a new entry for “nyr”.

Lexeme	nyr
Part of Speech	
Gloss English	

- **Type “postp” as the part of speech.**
- **Press down arrow to move to the gloss field.**
- **Type “by” as the gloss.**

Lexeme	nyr
Part of Speech	postp
Gloss English	by

4.25 Morphological Summary

Now you will see how nicely Return from Jump works.

- **Press Ctrl+R to return from jump.**

You will see the text updated to reflect the new dictionary entry.

Reference	Fish.001
Text	Todn lyfch nyr velgoi.
Morpheme Breaks	*Todn lyfch nyr *velgoi
Gloss English	*** lily.pad by ***
Part of Speech	*** n postp ***

- **Close Toolbox.**

4.8. Capitalized Words in Interlinearization

If the orthography of your text uses capitalization at the beginning of sentences, then you will need to change such words to lower case when you enter them in the dictionary. Proper names can be capitalized in the dictionary. Words that are capitalized in the dictionary match only capitalized words in text. Words that are lower case in the dictionary match both upper and lower case in the text.

Exercise: Capitalized Words in Interlinearization

- **Open the project in the folder “7 Capitalized Words in Interlinearization”.**

You will see the Amadup interlinear text as it was at the end of the last exercise.

Reference	Fish.001			
Text	Todn	lyfch	nyr	velgoi.
Morpheme Breaks	*Todn	lyfch	nyr	*velgoi
Gloss English	***	lily.pad	by	***
Part of Speech	***	n	postp	***

The Amadup speaker tells you that the word “todn” means “frog”.

- **Right click on “*Todn” in the Morpheme Breaks field.**

You will see a dialog box titled “No Matches”.

- **Press Enter.**

The dictionary window will show a new entry for “Todn”.

Since “todn” is not a proper name, it should not be capitalized in the dictionary.

- **Change “T” to “t” in the lexeme.**
- **Enter “n” as the part of speech.**
- **Enter “frog” as the gloss.**

Lexeme	todn
Part of Speech	n
Gloss English	frog

- **Press Ctrl+R to return from jump.**

You will see the text updated to reflect the new dictionary entry.

Reference	Fish.001			
Text	Todn	lyfch	nyr	velgoi.
Morpheme Breaks	todn	lyfch	nyr	*velgoi
Gloss English	frog	lily.pad	by	***
Part of Speech	n	n	postp	***
Free Translation	Long ago a frog lived by a lily pad.			

- **Close Toolbox.**

4.9. Starting Morphology

It is not necessary to use a word list to analyze morphology, but it is extremely helpful. You can look at a word list in two windows, sorted from opposite ends. That way you can see all the words that begin the same collected together, and all the words that end the same collected together. This shows a list of occurrences of the same root or prefix together in one window, and a list of occurrences of the same suffix together in the other window.

4.9.1. Making a Word List

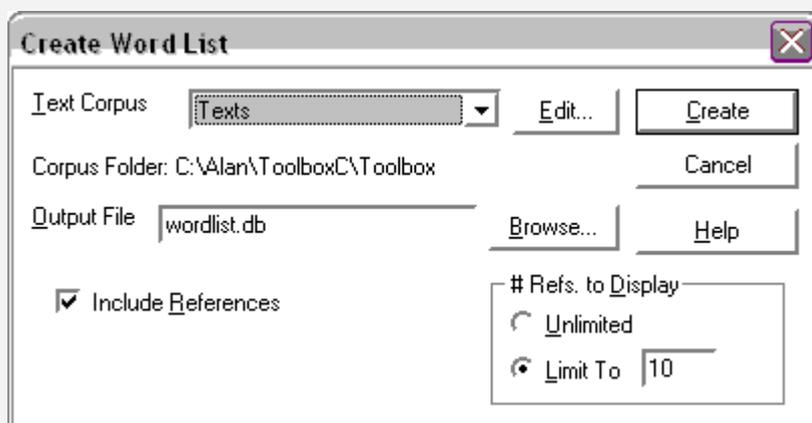
Exercise: Making a Word List

- **Open the project in the folder “8 Making a Word List”.**

You will see the Amadup interlinear text as it was at the end of the last exercise.

- **Choose Tools, Word List.**

You will see a dialog box with word list options:



These options are what we want.

- **Click on Create.**

You will see a list of the words in the Amadup text. Each word has a count of the number of times it occurs and a list of references of the places it occurs.

Word	Count	References
blo	3	Fish.004; Fish.006; Fish.008
bzervegonsi	2	Fish.004; Fish.006
bzervegonso	1	Fish.005
detn	1	Fish.008
dij	1	Fish.005
din	3	Fish.004; Fish.006; Fish.007
doj	1	Fish.006
don	2	Fish.005; Fish.009
doshusetn	1	Fish.008
dukyet	1	Fish.010
dukyetch	1	Fish.010
eh	1	Fish.008
jlyj	2	Fish.004; Fish.006

The word list window is covering part of the text, so it needs to be moved and made smaller. You can move a window by clicking on the title bar and dragging it. You can resize a window by dragging its corners or sides.

- **Position the word list window in the lower left corner of the main window.**

The screenshot shows the 'Toolbox - wordlist.db' application. The 'Texts.txt' window displays the following text:

Identification	Frog Meets Fish
Reference	Fish.001
Text	To dn lyfch nyr velgoi.
Morpheme Breaks	to dn lyfch nyr *velgoi
Gloss English	frog lily.pad by ***
Part of Speech	n n postp ***
Free Translation	Long ago a frog lived by a lily pad.

The 'wordlist.db' window shows a table of words and their references:

Word	Count	References
blo	3	Fish.004 Fish.006 Fish.008
bzervegon si	2	Fish.004 Fish.006
bzervegon so	1	Fish.005
detn	1	Fish.008
dij	1	Fish.005
din	3	Fish.004 Fish.006 Fish.007
doj	1	Fish.006
don	2	Fish.005 Fish.009
doshusetn	1	Fish.008

The status bar at the bottom shows '\w blo' and '1/28'.

The best way to make the word list show a particular word is to right click on the word in the text line of the interlinear text window.

- **Right click on “velgoi” in the text line.**

The word list window will move to highlight the word “velgoi”.

The screenshot shows the 'wordlist.db' window with the word 'velgoi' highlighted in the list:

Word	Count	References
sezgonso	1	Fish.009
tap	3	Fish.002; Fish.003; Fish.005
to dj	1	Fish.005
to dn	4	Fish.001; Fish.004; Fish.006;
velgoi	1	Fish.001
wiglo	1	Fish.004

If it doesn't do this, make sure you clicked in the text line. If you clicked in the morpheme breaks line, the word list will not move in the same way.

- **Close Toolbox.**

4.9.2. Sorting a Word List from Both Ends

To see a word list sorted from both ends one makes a duplicate window and changes the second window to sort from the end.

Exercise: Sorting a Word List from Both Ends

- **Open the project in the folder “9 Sorting a Word List from Both Ends”.**

You will see the Amadup interlinear text as it was at the end of the last exercise. The focus is on the word list window.

- **Choose Window, Duplicate.**

You will see a second word list window.

- **Position the second word list in the lower right corner of the main window.**

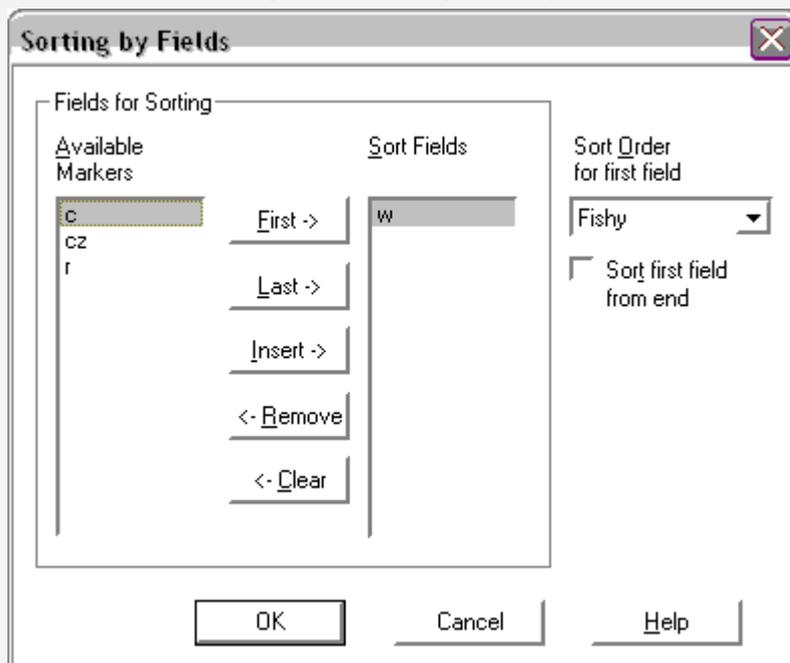
This will give you two word list windows side by side.

Word	Count	References
blo	3	Fish.004; Fish.006; Fish.008
bzervegonsi	2	Fish.004; Fish.006
bzervegonso	1	Fish.005
detn	1	Fish.008
dij	1	Fish.005
din	3	Fish.004; Fish.006; Fish.007
doj	1	Fish.006
don	2	Fish.005; Fish.009
doshusetn	1	Fish.008

Next we change the sorting of the second window to sort from the end.

- **Choose Database, Sorting.**

You will see a dialog box showing the way the window is sorted.



- **Turn on “Sort first field from end.”**

Sort first field from end

- **Click OK.**

You will see the right hand word list window sorted from the end. You can tell that it is sorted from the end by the fact that it is right justified in the browse column.

Word	Count	References
blo	3	Fish.004; Fish.006; Fish.008
bzervegonsi	2	Fish.004; Fish.006
bzervegonso	1	Fish.005
detn	1	Fish.008
dij	1	Fish.005
din	3	Fish.004; Fish.006; Fish.007
doj	1	Fish.006
don	2	Fish.005; Fish.009
doshusetn	1	Fish.008

Word	Count	References
don	2	Fish.005; Fish
detn	1	Fish.008
doshusetn	1	Fish.008
jlyn	2	Fish.005; Fish
blo	3	Fish.004; Fish
wiglo	1	Fish.004
zervegonso	1	Fish.005
sezgonso	1	Fish.009
plap	1	Fish.002

A Toolbox feature called parallel move will cause these two windows to move together so that they always show the same word.

- **Click on the word “bzervegonsi” in the left word list.**

You will see the other word list move to show the same word.

Word	Count	References
blo	3	Fish.004; Fish.006; Fish.008
bzervegonsi	2	Fish.004; Fish.006
bzervegonso	1	Fish.005
detn	1	Fish.008
dij	1	Fish.005
din	3	Fish.004; Fish.006; Fish.007
doj	1	Fish.006
don	2	Fish.005; Fish.009
doshusetn	1	Fish.008

Word	Count	References
dukyetch	1	Fish.010
eh	1	Fish.008
velgoi	1	Fish.001
joygoi	1	Fish.002
bzervegonsi	2	Fish.004; Fish
plapgonso	1	Fish.003
sezgonso	1	Fish.007
tojdj	1	Fish.005
dij	1	Fish.005

Parallel move is very useful for a variety of things. In the next section we will use it to study the morphology of the Amadup language.

- **Close Toolbox.**

4.9.3. Using Word Lists to Analyze Morphology

We can use word lists to analyze morphology by looking at words that start the same and words that end the same.

Exercise: Using Word Lists to Analyze Morphology

- **Open the project in the folder “10 Using Word Lists to Analyze Morphology”.**

You will see the Amadup interlinear text and the two word lists as they were at the end of the last exercise.

We have only the word “velgoi” left to interlinearize in the first sentence. The Amadup speaker says he doesn’t know what it means. He says that is just the way they say it. You look at the free translation and decide that it probably includes both the meaning “live” and the meaning “long ago”. You want to see other words that start or end similarly to help you analyze it.

- **Right click on the word “velgoi” in the text line of the interlinear text.**

You will see both word lists move to show it.

Word	Count	References
sezgonso	1	Fish.009
tap	3	Fish.002; Fish.003; Fish.005
todj	1	Fish.005
todn	4	Fish.001; Fish.004; Fish.006;
velgoi	1	Fish.001
wiglo	1	Fish.004

Word	Count	References
joyme	1	Fish.010
lyfch	4	Fish.001; Fisl
dukyetch	1	Fish.010
eh	1	Fish.008
velgoi	1	Fish.001
joygoi	1	Fish.002
bzervegonsi	2	Fish.004; Fisl
plapgonsi	1	Fish.003
sezgonsi	1	Fish.007

You are disappointed that no other words in the corpus begin the same way, but you see one other word “joygoi” that also ends with “goi”. So you hypothesize that “goi” may be a suffix.

- **Click on “joygoi”.**

You see that there are two words that start with “joy”. One ends with “goi”, and the other with “me”. This reinforces your hypothesis that “goi” is a suffix.

jlyn	2	Fish.005; Fish.009	eh	1	Fish.008
joygoi	1	Fish.002	velgoi	1	Fish.001
joyme	1	Fish.010	joygoi	1	Fish.002
klimen	1	Fish.008	bzervegonsi	2	Fish.004; Fisl

- **Close Toolbox.**

4.9.4. Entering Affixes and Roots in the Dictionary

To enter an affix or root in the dictionary, select just that part of a word in the morpheme breaks line, and use right click to insert it.

Exercise: Entering Affixes and Roots in the Dictionary

- **Open the project in the folder “11 Entering Affixes and Roots in the Dictionary”.**

You will see the Amadup project as it was at the end of the previous exercise.

- **Select “goi” in the morpheme breaks line.**

Text	Todn lyfch nyr velgoi
Morpheme Breaks	todn lyfch nyr *velgoi

- **Right click on the selected “goi”.**

You will see the “No matches box”.

- **Press Enter to insert into the dictionary.**

You will see a new dictionary entry. The dictionary window comes into focus in front of the word list window.

Lexeme	Part of Speech	Gloss English
goi		
jlyn	2	Fish.005; Fish.009
joygoi	1	Fish.002
joyme	1	Fish.010

Word	Count	References
joyme	1	Fish.010
lyfch	4	Fish.001; Fish.010
dukyetch	1	Fish.010
eh	1	Fish.008
velgoi	1	Fish.001
joygoi	1	Fish.002

To make a lexical entry a suffix, one adds a hyphen in front of it.

- **Add a hyphen in front of “goi” to make “-goi”.**

Lexeme	-goi
--------	------

You hypothesize that the suffix “goi” carries the meaning of “long ago”, so you call it “distant past” abbreviated “DPst”. Glosses of affixes are usually abbreviations that start with an upper case letter (but no period at the end).

The part of speech of an affix is usually its category. Distant past is a tense, so you will use “tns” as its part of speech.

- **Enter “tns” as the part of speech.**
- **Enter “DPst” as the gloss.**

Lexeme	-goi
Part of Speech	tns
Gloss English	DPst

- **Press Ctrl+R to return from jump.**

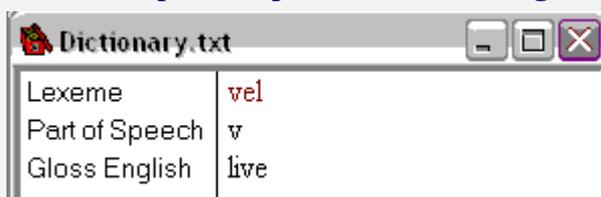
4.25 Morphological Summary

You will see the affix “-goi” shown as an affix under “velgoi”. The star in front of “vel” means that it is not yet in the lexicon.

Reference	Fish.001
Text	Todn lyfch nyr velgoi.
Morpheme Breaks	todn lyfch nyr *vel -goi
Gloss English	frog lily.pad by *** -DPst
Part of Speech	n n postp *** -tns

Next we will enter the root “vel” and give it a gloss of “live”.

- **Right click on “vel”.**
- **Press Enter to insert it into the dictionary.**
- **Enter a part of speech of “v” and a gloss of “live”.**



Lexeme	vel
Part of Speech	v
Gloss English	live

- **Press Ctrl+R to return from jump.**

You will see the word “velgoi” analyzed into morphemes.

Reference	Fish.001
Text	Todn lyfch nyr velgoi.
Morpheme Breaks	todn lyfch nyr vel -goi
Gloss English	frog lily.pad by live -DPst
Part of Speech	n n postp v -tns
Free Translation	Long ago a frog lived by a lily pad.

This completes a tentative analysis of the first sentence of the text. We may come back and adjust it later as we improve our analysis of the language, but this is a good start.

- **Close Toolbox.**

4.10. Interlinearizing More Text

Once you have some text interlinearized, then each time you interlinearize a new sentence, some words in it will parse successfully, and others will fail. You will look at the failed words and add new roots or affixes to the dictionary to make them succeed.

Exercise: Interlinearizing Sentence 2

- **Open the exercise “12 Interlinearizing Sentence 2”.**

You will see the text as it was at the end of the previous exercise.

- **Scroll down until sentence 2 is at the top of the window.**

Texts.txt	
Reference	Fish.002
Text	Lyfch tap plap joygoi.
Free Translation	He liked to sit on the lily pad.

- **Click to place the cursor at the front of the text line.**
- **Click the interlinearize button.**

You will see the sentence interlinearized.

Reference	Fish.002
Text	Lyfch tap plap joygoi.
Morpheme Breaks	lyfch *tap *plap *joy -goi
Gloss English	lily.pad *** *** *** -DPst
Part of Speech	n *** *** *** -tns
Free Translation	He liked to sit on the lily pad.

As is typical in interlinearizing, some words succeed and others fail.

Since the language appears to have postpositions, you hypothesize that “tap” means “on”.

- **Insert “tap” in the dictionary as “postp” with gloss of “on”.**

Lexeme	tap
Part of Speech	postp
Gloss English	on

- **Press Ctrl+R to return from jump.**

You will see “tap” interlinearized.

- **Insert “plap” in the dictionary as “v” with gloss of “sit”.**
- **Return from jump to interlinearize “plap”.**
- **Insert “joy” in the dictionary as “v” with gloss of “like”.**
- **Return from jump to interlinearize “joygoi”.**

4.25 Morphological Summary

You will see the sentence fully interlinearized.

Reference	Fish.002
Text	Lyfch tap plap joygoi.
Morpheme Breaks	lyfch tap plap joy -goi
Gloss English	lily pad on sit like -DPst
Part of Speech	n postp v v -tns
Free Translation	He liked to sit on the lily pad.

This looks very nice.

- **Close Toolbox.**

Exercise: Interlinearizing More Sentences

- **Open the exercise “13 Interlinearizing More Sentences”.**

You will see the text as it was at the end of the previous exercise.

- **Scroll down to the third sentence and interlinearize it.**

Reference	Fish.003
Text	Lyfch tap plapgonsi.
Morpheme Breaks	lyfch tap plap - *gonsi
Gloss English	lily.pad on sit - ****
Part of Speech	n postp v - ****
Free Translation	One day he was sitting on the lily pad.

It is very nice to see that this sentence analyzes almost completely.

It looks like “gonsi” is a suffix, and we see that it might have some relationship to “goi”. But we do not have enough information to decide how to analyze it yet, so we will move on to some more sentences. We do not have to finish interlinearizing one sentence before we go on to others. In fact, sometimes it is more effective to move on and come back later.

- **Scroll down to the fourth sentence and interlinearize it.**

Reference	Fish.004
Text	Din todn jlyj lyfch blo wiglo bzervegonsi.
Morpheme Breaks	*Din todn *jlyj lyfch *blo *wiglo *bzervegonsi
Gloss English	*** frog *** lily.pad *** *** ***
Part of Speech	*** n *** n *** *** ***
Free Translation	The frog saw a fish swimming under the lily pad.

From this sentence we hypothesize that “blo” is a postposition meaning “under”, that “jlyj” is a noun meaning “fish”, and that “din” is a determiner “det” meaning “the”.

- **If you want to practice entering words in the dictionary, enter those words.**

The result will have those words interlinearized.

Reference	Fish.004
Text	Din todn jlyj lyfch blo wiglo bzervegonsi.
Morpheme Breaks	din todn jlyj lyfch blo *wiglo *bzervegonsi
Gloss English	the frog fish lily.pad under *** ***
Part of Speech	det n n n postp *** ***
Free Translation	The frog saw a fish swimming under the lily pad.

- **Close Toolbox.**

4.11. Analyzing Morphological Case

One aspect of the Amadup language that we have not discovered yet is that it has a morphological case system. The next set of exercises will show how to find evidence of such a system, how to analyze it, and how to handle it in Toolbox.

Exercise: Morphological Case

- **Open the exercise “14 Morphological Case”.**

You will see the text as it was at the end of the previous exercise.

- **Scroll down to sentence 5 and interlinearize it.**

Reference	Fish.005
Text	Don jlyn dij todj tap bzervegonso.
Morpheme Breaks	*Don *jlyn *dij *todj tap *bzervegonso
Gloss English	*** *** *** *** on ***
Part of Speech	*** *** *** *** postp ***
Free Translation	The fish looked up at the frog.

Sentence 6 looks very similar, so we will interlinearize it as well, and compare the two.

- **Scroll down to sentence 6 and interlinearize it.**

Reference	Fish.006
Text	Din todn doj jlyj blo bzervegonsi.
Morpheme Breaks	din todn *doj jlyj blo *bzervegonsi
Gloss English	the frog *** fish under ***
Part of Speech	det n *** n postp ***
Free Translation	The frog looked down at the fish.

Comparing these two sentences gives strong evidence of morphological case. In sentence 6, the words “todn” and “jlyj” appear in the same form in which we saw them previously. But in sentence 5, they are in different forms. The word for frog is “todj” and the word for fish is “jlyn”. It looks like “-n” is probably a case marker for the subject or actor, and “-j” is probably a case marker for object or undergoer. Until we find further evidence, we will call “-n” nominative case, and “-j” objective case.

Now that we know that “todn” and “jlyj” have case markers on them, we need to fix their dictionary entries to show only the root.

- **Right click on “todn” in the morpheme breaks line.**

You will see its dictionary entry.

- **Change “todn” to “tod”.**

Lexeme	tod
Part of Speech	n
Gloss English	frog

- **Return from jump.**

You will see “todn” split into a root and a proposed affix with a star as a failure mark.

Reference	Fish.006
Text	Din todn
Morpheme Breaks	din tod - *n
Gloss English	the frog - ****
Part of Speech	det n - ****

- **Change the dictionary entry of “jlyj” to “jly” in the same way.**

You will see “jlyj” split into a root and a proposed affix with a star as a failure mark.

Reference	Fish.006
Text	Din todn doj jlyj
Morpheme Breaks	din tod - *n *doj jly - *j
Gloss English	the frog - **** **** fish - ****
Part of Speech	det n - **** **** n - ****

- **Insert a dictionary entry for “-n” with part of speech “case” and gloss “Nom”.**

- **Return from jump.**

You will see “todn” successfully analyzed into two morphemes.

Text	Din todn
Morpheme Breaks	din tod -n
Gloss English	the frog -Nom
Part of Speech	det n -case

(Be sure you remember to put a hyphen in front of “-n” in the dictionary. If you forget the hyphen, you will see a space between the hyphen and the “n” in the interlinear text.)

Wrong: tod - n

- **Insert a dictionary entry for “-j” with a part of speech “case” and gloss “Obj”.**

- **Return from jump.**

You will see “jlyj” successfully analyzed into two morphemes.

Text	Din todn doj jlyj
Morpheme Breaks	din tod - n *doj jly -j
Gloss English	the frog - Nom **** fish -Obj
Part of Speech	det n - case **** n -case

Now that we have entered these two case suffixes in the dictionary, we can successfully analyze the words for frog and fish in sentence 5.

- **Scroll back to sentence 5.**
- **Click in word “jlyn” to place the cursor in it.**
- **Interlinearize.**

It will analyze as “fish -Nom”.

4.25 Morphological Summary

- **Click in the word “todj” to place the cursor in it.**
- **Interlinearize.**

It will analyze as “frog -Obj”.

Reference	Fish.005
Text	Don jlyn dij todj
Morpheme Breaks	*Don jly -n *dij tod -j
Gloss English	*** fish -Nom *** frog -Obj
Part of Speech	*** n -case *** n -case

Notice that the first time you interlinearized each sentence, Toolbox did the whole sentence. But when you are in text that was already interlinearized, then the interlinearize command only redoes the current word. Also, notice that when you change the dictionary, Toolbox does not automatically change the analysis of words that have already been interlinearized. (Later we will see a way to do something like that.)

- **Close Toolbox.**

4.12. Toolbox Shows Possible Affixes

When you interlinearize a word that Toolbox cannot fully parse, if it sees possible affixes on the word, it shows them. Such affixes may not be correct, but Toolbox shows them to help you see the possibilities.

Exercise: Possible Affixes

- **Open the exercise “15 Possible Affixes”.**

You will see the text as it was at the end of the previous exercise.

If you look at the determiners “don” and “dij” you will notice that they end with the same letter as the following noun. This suggests that they might have case suffixes.

- **Interlinearize “Don” and “dij”.**

Text	Don	jlyn	dij	todj
Morpheme Breaks	*Do -n	jly -n	*di -j	tod -j
Gloss English	*** -Nom	fish -Nom	*** -Obj	frog -Obj
Part of Speech	*** -case	n -case	*** -case	n -case

You can see that Toolbox suggests that the “-n” and “-j” might be case markers. It does this to help you see the possibilities.

- **Move to sentence 6 and interlinearize “doj”.**

Text	Din todn	doj	jlyj
Morpheme Breaks	din tod -n	*do -j	jly -j
Gloss English	the frog -Nom	*** -Obj	fish -Obj
Part of Speech	det n -case	*** -case	n -case

Toolbox suggests that the “-j” on the determiner “doj” might be a case marker.

Now that Toolbox knows that “-n” is an affix, you might expect to see it on “din”.

- **Interlinearize “Din”.**

Nothing changes.

Text	Din todn	doj	jlyj
Morpheme Breaks	din tod -n	*do -j	jly -j
Gloss English	the frog -Nom	*** -Obj	fish -Obj
Part of Speech	det n -case	*** -case	n -case

The reason “din” still analyzes as it did before is that Toolbox finds the whole word “din” in the dictionary. If it finds the whole word, then it does not try to break off any affixes.

We will examine the determiners more in the next exercise.

- **Close Toolbox.**

4.13. Analyzing Noun Class Morphology

Many languages divide nouns into classes, based on gender or other criteria. Often affixes of surrounding words show agreement with the class of the noun. In such languages, the recommended approach in Toolbox is to add a letter to the part of speech to indicate the class of the noun. For example, a feminine noun could be “nf”, and masculine noun “nm”. In a similar way, verbs are often classified as transitive “vt” and intransitive “vi”.

Exercise: Noun Class Morphology

- **Open the exercise “16 Noun Class Morphology”.**

You will see the text as it was at the end of the previous exercise. The text window has been enlarged so you can see both sentences 5 and 6.

If you compare the determiners in sentences 5 and 6, you can see that after you cut off the case markers, they still have two different forms, “di” and “do”. If you look carefully, you will see that “di” is used with “frog”, and “do” is used with “fish”. On that basis, we will hypothesize that the “-i” and “-o” are noun class agreement affixes.

Since we have no basis for naming these noun classes, we will use numbers. We will say that “frog” is gender class one, and “fish” is gender class two.

First, we will assign classes to the nouns. We will give “tod” a part of speech of “n1” (digit 1).

- **Right click on “tod” in the morpheme breaks line (under “todj”) to go to its dictionary entry.**
- **Change the part of speech to “n1” (digit 1).**
- **Return from jump to interlinearize.**

```
todj
tod -j
frog -Obj
n1 -case
```

Next we want to insert an affix “-i”. But it does not occur by itself, so we will first select just the letter “i” from “*di” in the morpheme breaks line, and then do right click to insert it.

- **Select the letter “i” from “*di”.**
- **Right click on the selected letter to insert affix “-i” in the dictionary.**
- **Give it a part of speech of “g” and a gloss of “1” (digit 1).**
- **Return from jump to interlinearize “dij”.**

```
dij
*d -i -j
*** -1 -Obj
*** -g -case
```

This result shows that the word “dij” has two suffixes and that its root is “d”.

We now know that the word “din” in the dictionary includes affixes, so we need to remove them to leave only the root.

- **Right click on “din” in the morpheme breaks line of sentence 6 to go to its dictionary entry.**
- **Change the lexeme to “d”.**
- **Return from jump to interlinearize “din”.**

It now breaks into three morphemes.

Din		todn	
d	-i	-n	tod -n
the	-1	-Nom	frog -Nom
det	-g	-case	n -case

Note that even though the part of speech of “tod” has changed to “n1” in the dictionary and in sentence 5, it has not changed in the word “todn” in sentence 6.

- **Interlinearize “todn”.**

It is updated to show its new part of speech.

Din		todn	
d	-i	-n	tod -n
the	-1	-Nom	frog -Nom
det	-g	-case	n1 -case

Notice that you can now see the noun class agreement in the interlinear text. You can see the “-1” class 1 affix on the determiner, and you can see the “n1” part of speech on the noun showing that it is class 1.

- **Interlinearize “dij” in sentence 5.**

It is updated to show its full analysis.

dij		todj	
d	-i	-j	tod -j
the	-1	-Obj	frog -Obj
det	-g	-case	n1 -case

Later we will see how to do updates like these automatically.

From here on I will assume you know how to use right click from the morpheme breaks line to jump to an existing entry in the dictionary, or to insert a new one. I will also assume you know to use return from jump to go from the dictionary back to the text and update the word you jumped from.

For the next two dictionary updates, jump from sentence 5.

- **Change the part of speech of “jly” to “n2”.**
- **Insert “-o” into the dictionary with part of speech “g” and gloss “2”.**

Reference	Fish.005
Text	Don jlyn
Morpheme Breaks	d -o -n jly -n
Gloss English	the -2 -Nom fish -Nom
Part of Speech	det -g -case n2 -case

4.25 Morphological Summary

- **Update “doj jlyj” in sentence 6 to reflect these changes.**

```
doj      jlyj
d  -o -j  jly  -j
the -2 -Obj fish -Obj
det -g -case n2 -case
```

At this point sentences 5 and 6 should be fully analyzed except for the verbs.

Reference	Fish.005
Text	Don jlyn dij todj tap bzervegonso
Morpheme Breaks	d -o -n jly -n d -i -j tod -j tap *bzervegonso
Gloss English	the -2 -Nom fish -Nom the -1 -Obj frog -Obj on ***
Part of Speech	det -g -case n2 -case det -g -case n1 -case postp ***
Free Translation	The fish looked up at the frog.
Reference	Fish.006
Text	Din todn doj jlyj blo bzervegonsi.
Morpheme Breaks	d -i -n tod -n d -o -j jly -j blo *bzervegonsi.
Gloss English	the -1 -Nom frog -Nom the -2 -Obj fish -Obj under ***
Part of Speech	det -g -case n1 -case det -g -case n2 -case postp ***
Free Translation	The frog looked down at the fish.

- **Close Toolbox.**

4.14. Automatic Interlinear Update

In the last lesson we made significant changes to the dictionary. We updated a couple of sentences to reflect those changes, but there are many more places that have not been updated. Toolbox does automatic interlinear update using the “Spelling and Interlinear Check” command. In Toolbox versions up to 1.4, this command is under the “Tools” menu. In later versions, it is under the “Checks” menu.

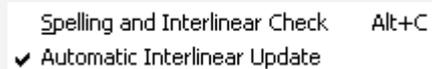
Exercise: Automatic Interlinear Update

- **Open the exercise “17 Automatic Interlinear Update”.**

You will see the text as it was at the end of the previous exercise.

- **Look at the “Checks” menu (“Tools” if no “Checks”).**

You will see the following two items.



You will see that “Automatic Interlinear Update” is checked. Notice that “Spelling and Interlinear Check” has a shortcut of Alt+C. It is important to learn this shortcut because you will use it a lot during interlinear updates.

To correctly begin an interlinear update, it is necessary to start at the top of the file.

- **Choose “Database, First Record” (or click the First Record button).**

You will see sentence 1 of the text.

- **Press Alt+C to begin interlinear check.**

Toolbox will highlight the first word of sentence 1, “Todn”. This means the word will change if you interlinearize it.

Reference	Fish.001
Text	Todn lyfch nyr velgoi.
Morpheme Breaks	todn lyfch nyr vel -goi
Gloss English	frog lily.pad by live -DPst
Part of Speech	n n postp v -tns

- **Press Alt+I to interlinearize.**

The word is analyzed into two morphemes, and the part of speech changes to “n1”.

```
Todn
tod -n
frog -Nom
n1 -case
```

If you wonder why Toolbox didn’t make that change automatically, it is because Toolbox is very careful not to automatically update in any way that might produce bad analyses without you seeing them. Some things it can update fully automatically without stopping to show you what it is doing, but those are primarily changes to part of speech or gloss in which there is no choice. For any word whose parse will change, Toolbox stops at the word so you can see the change and verify that it is correct.

4.25 Morphological Summary

- **Press Alt+C to continue interlinear check.**

Toolbox stops at “Din” in sentence 4. It still has the old whole word gloss from before we changed the root to “d”.

```
Din
din
the
det
```

- **Press Alt+I to update it.**

It parses into three morphemes, as it should.

```
Din
d -i -n
the -1 -Nom
det -g -case
```

You should learn the sequence Alt+C, followed by Alt+I. This brings you to a word that needs updating, and then updates it.

- **Press Alt+C and then Alt+I.**

You will see “todn” updated.

- **Press Alt+C and then Alt+I.**

You will see “jlyj” updated.

- **Press Alt+C.**

This time the highlight is on the word “sezgonsi” in sentence 7, which new text which you have not yet interlinearized for the first time.

Reference	Fish.007
Text	Din todn sezgonsi,
Free Translation	The frog said,

When you see that Toolbox has arrived in new, uninterlinearized text, then you know that it is done. (We will see later what happens if there is no uninterlinearized text.)

- **Close Toolbox.**

4.15. Reshape Interlinear Text

During interlinearization, lines become longer, so you will often want to reshape an interlinear sentence. You can reshape a single referenced unit of interlinear text with the “Reshape” command (Shift+F5). You can also use the “Reshape Entire File” command if you want.

One way to gain more width for interlinear text is to view the markers instead of the field names.

Exercise: Reshape Interlinear Text

- **Open the exercise “18 Reshape Interlinear Text”.**

You will see sentences 4 and 5 of the text. Both of these sentences have grown too long for the line.

- **Press Shift+F5 to reshape sentence 4.**

The last word and its annotations move down to a new line.

Reference	Fish.004
Text	Din todn jlyj lyfch blo wiglo
Morpheme Breaks	d -i -n tod -n jly -j lyfch blo *wigl -o
Gloss English	the -1 -Nom frog -Nom fish -Obj lily.pad under **** -2
Part of Speech	det -g -case n1 -case n2 -case n postp **** -g
Text	bzervegonsi.
Morpheme Breaks	*bzervegons -i
Gloss English	**** -1
Part of Speech	**** -g
Free Translation	The frog saw a fish swimming under the lily pad.

- **Place the cursor in the text line of sentence 5.**
- **Press Shift+F5 to reshape sentence 5.**

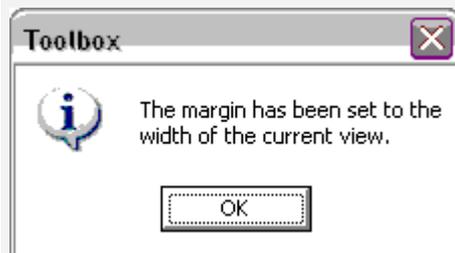
Its last word moves down to a new line.

- **Choose View, Markers.**

You will see that the text can now have more width. But it won't use the extra width until you change the wrap margin.

The Set Wrap Margin command was moved from the Tools menu to the Database menu in version 1.5.

- **Choose the Set Wrap Margin command (under Database or Tools).**



4.25 Morphological Summary

- **Press Shift+F5.**

Sentence 5 now fits on one line again.

\ref	Fish.005
\tx	Don jlyn dij todj tap bzervegonso.
\mb	d -o -n jly -n d -i -j tod -j tap *bzervegons -o
\ge	the -2 -Nom fish -Nom the -1 -Obj frog -Obj on *** -2
\ps	det -g -case n2 -case det -g -case n1 -case postp *** -g

- **Choose “Reshape Entire File” (under Database or Tools).**

Toolbox will ask if you really want to do it.

- **Click OK.**

When reshape is done, the window will show sentence 1. If you scroll down, you will see that sentence 4 now fits on one line again.

- **Close Toolbox.**

Exercise: Adding Verb Roots to the Dictionary

This is a practice exercise that does not introduce any new Toolbox features.

- **Open the exercise “19 Adding Verb Roots to the Dictionary”.**

You will see sentence 4 as it was at the end of the previous exercise.

The Amadup speaker tells you that “wigl” means “swim”, and “bzerve” means “see”.

- **Add “wigl”, part of speech “v”, gloss “swim” to the dictionary.**

(Remember that to do that, you right click on “wigl” in the morpheme breaks line, enter the part of speech and gloss, and then press Ctrl+R to return from jump and interlinearize.)

- **Add “bzerve”, “v”, “see” to the dictionary.**

(Remember that to do that, you first select “bzerve” from “bzervegons” in the morpheme breaks line, then do right click on the selection.)

\ref	Fish.004
\tx	Din todn jlyj lyfch blo wiglo bzervegonsi.
\mb	d -i -n tod -n jly -j lyfch blo wigl -o bzerve - *gons -i
\ge	the -1 -Nom frog -Nom fish -Obj lily.pd under swim -2 see - **** -1
\ps	det -g -case n1 -case n2 -case n postp v -g v - **** -g
\ft	The frog saw a fish swimming under the lily pad.

- **Interlinearize “bzervegonso” in sentence 5.**

```
bzervegonso.
bzerve - *gons -o
see - **** -2
v - **** -g
```

- **Move to sentence 7 and interlinearize it.**

- **Add “sez”, “v”, “say” to the dictionary.**

\ref	Fish.007
\tx	Din todn sezgonsi,
\mb	d -i -n tod -n sez - *gons -i
\ge	the -1 -Nom frog -Nom say - **** -1
\ps	det -g -case n1 -case v - **** -g
\ft	The frog said,

- **Interlinearize sentence 8.**

\ref	Fish.008
\tx	"Detn klimen blo doshusetn eh?"
\mb	d - *et -n *klime -n blo d - *oshuset -n *eh
\ge	the - **** -Nom **** -Nom under the - **** -Nom ****
\ps	det - **** -case **** -case postp det - **** -case ****
\ft	"How is the weather down there?" (Lit. Is the weather good down there?)

4.25 Morphological Summary

It looks like “Detn klimen” is a determiner and noun, but the determiner has a different form than the ones we have seen before. This implies that “klime” is a different noun class. We will call it “n3”.

- **Add “klime”, “n3”, “weather” to the dictionary.**

Based on the pattern of the other determiners, “-et” is a gender agreement suffix.

- **Add “-et”, part of speech “g”, gloss “3” to the dictionary.**

```
"Detn      klimen
d  -et -n  klime  -n
the -3  -Nom weather -Nom
det -g  -case n3    -case
```

- **Interlinearize the word “doshusetn”.**

```
doshusetn
d  - *oshus -et -n
the - ***  -3 -Nom
det - ***  -g -case
```

Now that we have added “-et” to the dictionary, Toolbox sees it as a possible suffix. The Amadup speaker confirms that “doshus” means “good”. It looks like Amadup adjectives have agreement suffixes for gender and case.

Notice that the “d” cut off the front of “doshusten” is a false guess by Toolbox. Toolbox shows you what it finds, but on new words, it often finds possibilities that are wrong. So you need to always check its guesses before you accept them.

When Toolbox has made a false guess, you can put the root back together before you do right click to enter it in the dictionary. You do this by temporarily editing the word in the morpheme breaks line.

- **In the morpheme breaks line, delete the extra characters from “d - *oshus” so that it becomes “doshus”.**

```
doshusetn
doshus  -et -n
the - *** -3 -Nom
det - *** -g -case
```

- **Right click on “doshus” to enter it in the dictionary with part of speech “adj”, and gloss “good”.**

```
doshusetn
doshus -et -n
good  -3 -Nom
adj   -g -case
```

When you return from jump, your temporary editing of “doshus” is replaced with the updated analysis.

The Amadup speaker says that “eh” means asking a question. We will call it a question marking particle.

- **Add “eh”, part of speech “part”, “Ques” to the dictionary.**

\ref	Fish.008
\tx	"Detn klimen blo doshusetn eh?"
\mb	d -et -n klime -n blo doshus -et -n eh
\ge	the -3 -Nom weather -Nom under good -3 -Nom Ques
\ps	det -g -case n3 -case postp adj -g -case part
\ft	"How is the weather down there?" (Lit. Is the weather good down there?)

This whole sentence is analyzed, and looks good.

- **Interlinearize sentence 9.**

\ref	Fish.009
\tx	Don jlyn sezgonso,
\mb	d -o -n jly -n sez - *gons -o
\ge	the -2 -Nom fish -Nom say - *** -2
\ps	det -g -case n2 -case v - *** -g
\ft	The fish said,

It does not contain any new roots.

- **Interlinearize sentence 10.**

\ref	Fish.010
\tx	"Dukyetch! Dukyetch joyme!"
\mb	d - *uky -et d - *ukyetch joy - *me
\ge	the - *** -3 the - *** like - ***
\ps	det - *** -g det - *** v - ***
\ft	"Wet, just the way I like it!"

The Amadup speaker confirms that “duky” means “wet”.

- **In the morpheme breaks line, delete the extra characters from “d - *uky” so that it becomes “duky”.**

```
"Dukyetch!
duky -et
the - *** -3
det - *** -g
```

- **Right click on “duky” to enter it in the dictionary with part of speech “adj”, and gloss “wet”.**

```
"Dukyetch!
duky -et
wet -3
adj -g
```

It appears that in the Amadup language, gender agreement suffixes occur on adjectives as well as determiners.

- **Press Alt+I to interlinearize the next word.**

4.25 Morphological Summary

Dukyetch
 duky - *etch
 wet - ****
 adj - ****

It looks very similar to “Dukyetch”, but with one more suffix. We will deal with that later.

At this point we have interlinearized the whole text once, and we have entered all the roots in the dictionary. All that remains is to analyze the affixes that occur in this text.

- **Close Toolbox.**

4.16. Jumping from References

One of the powerful ways you can use a word list is to jump from a reference in the word list to the word in the text. We will use this feature to help us analyze the morphology of the verbs in this text.

Exercise: Analyzing Verb Morphology

- **Open the exercise “20 Analyzing Verb Morphology”.**

You will see sentence 4 as it was at the end of the previous exercise. The text window has been made smaller so that the two word list windows are fully visible.

The screenshot shows a software interface with three windows:

- Texts.txt:** Displays a sentence with morphological annotations. The sentence is: "The frog saw a fish swimming under the lily pad." The annotations include:

\ref	Fish.004
\tx	Din todn jlyj lyfch blo wiglo bzervegonsi.
\mb	d -i -n tod -n jly -j lyfch blo wigl -o bzerve - *gons -i
\ge	the -1 -Nom frog -Nom fish -Obj lily.pad under swim -2 see - **** -1
\ps	det -g -case n1 -case n2 -case n postp v -g v - **** -g
\ft	The frog saw a fish swimming under the lily pad.
\ref	Fish.005
- wordlist.db:1:** A table showing word counts and references.

Word	Count	References
sezgonsi	1	Fish.007
sezgonso	1	Fish.009
tap	3	Fish.002; Fish.003; Fish.005
todj	1	Fish.005
todn	4	Fish.001; Fish.004; Fish.006;
velgoi	1	Fish.001
wiglo	1	Fish.004
- wordlist.db:2:** A table showing word counts and references.

Word	Count	References
todj	1	Fish.005
dij	1	Fish.005
doj	1	Fish.006
jlyj	2	Fish.004; Fish
todn	4	Fish.001; Fish
klimen	1	Fish.008
din	3	Fish.004; Fish
don	2	Fish.005; Fish
detn	1	Fish.008
doshusetn	1	Fish.008

We want to finish analyzing the suffixes on the verbs. We will use the word lists to help us do that.

- **Right click on “bzervegonsi” in the text line.**

The word lists jump to show it.

Word	Count	References
blo	3	Fish.004; Fish.006; Fish.008
bzervegonsi	2	Fish.004; Fish.006
bzervegonso	1	Fish.005
detn	1	Fish.008
dij	1	Fish.005
din	3	Fish.004; Fish.006; Fish.007
doj	1	Fish.006
don	2	Fish.005; Fish.009
doshusetn	1	Fish.008
dukyet	1	Fish.010

Word	Count	References
lyfch	4	Fish.001; Fish.002
dukyetch	1	Fish.010
eh	1	Fish.008
velgoi	1	Fish.001
joygoi	1	Fish.002
bzervegonsi	2	Fish.004; Fish.006
plapgonsi	1	Fish.003
sezgonsi	1	Fish.007
todj	1	Fish.005
dij	1	Fish.005

We want to look at all the words that end similarly, to see the suffix patterns. We see that there are three words that end with “-gonsi”. In sentence 4, we can see that the final “-i” is agreement with a subject of gender class 1, in this case, the word “frog”. We want to look at the other sentences that end that way.

In a word list, a right click on a reference causes the text to jump to show that word in context.

- **Right click on the reference “Fish.007” in the word list line with “sezgonsi”.**

The text window jumps to sentence 7, and the word “sezgonsi” is highlighted.

```

\ref Fish.007
\tx Din      todn      sezgonsi
\mb d -i -n  tod -n  sez - *gons -i
\ge the -1 -Nom frog -Nom say - *** -1
\ps det -g -case n1 -case v - *** -g

\ft The frog said,

\ref Fish.008
    
```

We see that “frog” is the subject of this sentence, and that the “-i” on the verb agrees with it in gender.

- **Right click on the reference “Fish.003” in the word list line with “plapgonsi”.**

The text window jumps to sentence 3, and the word “plapgonsi” is highlighted.

```

\ref Fish.003
\tx Lyfch tap  plapgonsi
\mb lyfch tap  plap - *gons -i
\ge lily.pad on  sit - *** -1
\ps n      postp v - *** -g

\ft One day he was sitting on the lily pad.
    
```

4.25 Morphological Summary

This sentence has no explicit subject, but we know from context that it was the frog who was sitting on the lily pad, so it makes sense that the verb shows gender agreement with “frog”.

So far we have confirmed that the “-i” at the end of a verb is often gender class 1, but we have not made any progress on analyzing the sequence “gons”. We notice that there are two verbs that end with “-goi”. They are “velgoi” and “joygoi”.

- **Right click on the reference “Fish.001” of “velgoi”.**

\ref	Fish.001
\tx	Todn lyfch nyr velgoi
\mb	tod -n lyfch nyr vel -goi
\ge	frog -Nom lily.pad by live -DPst
\ps	n1 -case n postp v -tns
\ft	Long ago a frog lived by a lily pad.

We see that we have glossed “-goi” as distant past. We did that early before we knew that “-i” was gender agreement. So, now we will correct that. We will jump to the entry for “-goi” in the dictionary and change it to “-go”.

To show you a possible confusing thing about jumping, I will first have you do it in a way that doesn’t work.

- **Right click on “-goi” in the morpheme breaks line.**

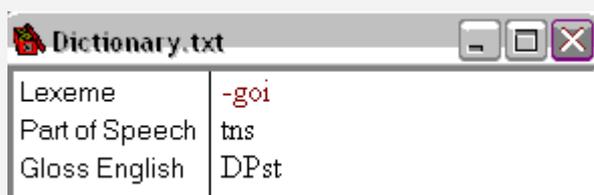
A word list is highlighted, but the dictionary does not open. The reason is that since the word “velgoi” was selected and was nearby, the jump used it instead of the word under the cursor. To prevent that, you can do a left click to turn off the selection, and then jump.

- **Left click on “-goi” in the morpheme breaks line.**

The word “velgoi” is no longer selected.

- **Right click on “-goi” in the morpheme breaks line.**

The dictionary window opens showing “-goi”. It shows in front of one of the word list windows.



Lexeme	-goi
Part of Speech	tns
Gloss English	DPst

- **Remove the final “i” from “-goi”.**
- **Return from jump.**

The word “velgoi” analyzes with “-i” as gender agreement.

velgoi
vel -go -i
live -DPst -1
v -tns -g

The other word that ends with “-goi” needs the same update.

- **Right click on the reference “Fish.002” of “joygoi”.**

\ref	Fish.002
\tx	Lyfch tap plap joygoi.
\mb	lyfch tap plap joy -goi
\ge	lily.pad on sit like -DPst
\ps	n postp v v -tns
\ft	He liked to sit on the lily pad.

- **Interlinearize.**

```
joygoi.
joy -go -i
like -DPst -1
v -tns -g
```

Now that we know that “go” is a suffix, we hypothesize that it is part of “gons”. We can compare the words that have “gons” with the words that have only “go”.

- **Right click on the reference “Fish.001” of “velgoi”.**

\ref	Fish.001
\tx	Todn lyfch nyr velgoi.
\mb	tod -n lyfch nyr vel -go -i
\ge	frog -Nom lily.pad by live -DPst -1
\ps	n1 -case n postp v -tns -g
\ft	Long ago a frog lived by a lily pad.

We notice that this looks like an action that was spread over a period of time. The same is true of “joygoi” in sentence 2.

- **Right click on the reference “Fish.007” of “sezgonsi”.**

\ref	Fish.007
\tx	Din todn sezgonsi.
\mb	d -i -n tod -n sez - *gons -i
\ge	the -1 -Nom frog -Nom say - **** -1
\ps	det -g -case n1 -case v - **** -g
\ft	The frog said,

This looks like an action that happened at a particular point in time.

- **Right click on the reference “Fish.004” of “bzervegonsi”.**

This is an action that could be seen as happening at a point in time.

- **Right click on the reference “Fish.003” of “plapgonsi”.**

\ref	Fish.003
\tx	Lyfch tap plapgonsi.
\mb	lyfch tap plap - *gons -i
\ge	lily.pad on sit - **** -1
\ps	n postp v - **** -g
\ft	One day he was sitting on the lily pad.

4.25 Morphological Summary

Even though the translation says “was sitting”, this might be viewed as an action at a particular time. We will hypothesize that “-ns” means punctiliar aspect.

- **Add “-ns” to the dictionary with part of speech “asp”, gloss “Pnct”.**

\ref	Fish.003
\tx	Lyfch tap plapgonsi.
\mb	lyfch tap plap -go -ns -i
\ge	lily.pad on sit -DPst -Pnct -l
\ps	n postp v -tns -asp -g
\ft	One day he was sitting on the lily pad.

This looks like a good analysis.

- **Close Toolbox.**

Exercise: Interlinear Update

- **Open the exercise “21 Interlinear Update”.**

You will see the text as it was at the end of the previous exercise.

We just added a new affix that occurs a number of places, so this is a good time to use the interlinear update.

- **Click the “First Record” button to go to the top of the text file.**
- **Press Alt+C to start interlinear update.**

```
bzervegonsi.
bzerve - *gons -i
see   - ***  -1
v     - ***  -g
```

- **Press Alt+I to update this word.**

```
bzervegonsi.
bzerve -go  -ns  -i
see   -DPst -Pnct -1
v     -tns  -asp -g
```

- **Press Alt+C and Alt+I to update the next word.**

```
bzervegonso.
bzerve -go  -ns  -o
see   -DPst -Pnct -2
v     -tns  -asp -g
```

- **Press Alt+C and Alt+I to update the next word, “bzervegonsi”.**
- **Press Alt+C and Alt+I to update the next word, “sezgonsi”.**
- **Press Alt+C and Alt+I to update the next word, “sezgonso”.**
- **Press Alt+C and Alt+I to try to update the next word, “Dukyetch”.**

This word does not change. If you press Alt+C again, it will highlight the same word. When this happens, it means that the interlinear update is done. There are no more words that can be updated to successfully parse, so it is showing words that fail to parse. This is to help you make sure that every word in a text has a successful parse. In the next exercise we will fix the last failures in this text.

- **Close Toolbox.**

4.17. Morphophonemics

Toolbox uses alternate forms to account for morphophonemics. The next exercise shows an example of how to do that.

Exercise: Simple Morphophonemics

- **Open the exercise “22 Simple Morphophonemics”.**

You will see the text as it was at the end of the previous exercise.

\ref	Fish.010
\tx	"Dukyetch Dukyetch joyme!"
\mb	duky -et duky - *etch joy - *me
\ge	wet -3 wet - *** like - ***
\ps	adj -g adj - *** v - ***
\ft	"Wet, just the way I like it!"

We see that the word “dukyetch” might be the object of the verb. If so, then the final “ch” would come from the object case marker “-j”. We will hypothesize that the “-j” loses its voicing to become “-ch” after a voiceless consonant.

It is not possible to express a general rule like that in Toolbox. In general, morphophonemics in Toolbox are expressed by showing alternate forms of affixes, sometimes with some conditioning environment included. In this case, we will make a simple alternate form.

- **Go to the dictionary window.**
- **Search for “-j”.**
- **Choose Edit, Insert Field, to insert an \a field (Alternate).**
- **Insert “-ch” into the alternate field.**

Lexeme	-j
Alternate	-ch
Part of Speech	case

- **Go to the text window and interlinearize “Dukyetch”.**

Dukyetch
duky -et -j
wet -3 -Obj
adj -g -case

The lexeme “-j” is shown as the underlying form in the morpheme breaks line.

- **Close Toolbox.**

4.18. Interlinear Check

So far we have used interlinear check to do automatic update of interlinear. But it is also useful for verifying the completeness and consistency of interlinear text. It makes sure that there are no failures, and that all of the interlinear annotations match information in the dictionary. That kind of checking is especially useful when interlinear text is being prepared for publication.

Exercise: Interlinear Check

- **Open the exercise “23 Interlinear Check”.**

You will see the text as it was at the end of the previous exercise.

\ref	Fish.010
\tx	"Duky et! Duky etch joy me! "
\mb	duky -et ducky -et -j joy - *me
\ge	wet -3 wet -3 -Obj like - ****
\ps	adj -g adj -g -case v - ****
\ft	"Wet, just the way I like it!"

This is the only failure left in this text. If we didn't know it was here, interlinear check would show it to us.

- **Click the “First Record” button to go to the top of the text file.**
- **Do interlinear check (Alt+C).**

joy me! "
joy - *me
like - ****
v - ****

The failure is highlighted.

- **Add “-me” to the dictionary with part of speech “pers” and gloss “1s”.**

joy me! "
joy -me
like -1s
v -pers

Now the interlinearization of this text is complete.

- **Click the “First Record” button to go to the top of the text file.**
- **Do interlinear check (Alt+C).**



This means that interlinear check is complete and no problems have been found. This dialog box will not appear as long as interlinear check finds any failures or problems in the text.

- **Close Toolbox.**

4.19. Adding Another Text

Each text is a record in the “Texts.txt” file. To add a new text, insert a new record, fill in its identification field, and type or paste in the text. You can use text numbering or renumbering as demonstrated earlier. You can enter a short text code in the first reference field, and later when the text has been entered, you can use text renumbering to fill in all the reference numbers.

Exercise: Adding Another Text

- **Open the exercise “24 Adding Another Text”.**

You will see the text as it was at the end of the previous exercise.

We will insert a new text titled “Frog Races Fish”. For references, we will use a text code of “Race”.

- **Choose Database, Insert Record.**

The screenshot shows a dialog box titled "Insert Record". It has a text input field labeled "Record to insert:" containing the text "Fish.001". To the right of the input field are three buttons: "OK", "Cancel", and "Help". Below the input field, there is a checked checkbox labeled "Match whole field". Underneath this, there is a section titled "Match characters:" with four radio button options: "By primary grouping only" (which is selected), "Disregarding case", "Exactly by secondary ordering", and "Even those normally ignored".

What you type as the “Record to insert” will be placed in the \id field.

- **Type “Frog Races Fish”, and click OK.**

The new text record appears with empty reference and text fields.

The screenshot shows a window titled "Texts.txt" with a table. The table has three columns: "\id", "\ref", and "\tx". The first row contains the text "Frog Races Fish" in the "\id" column, and the "\ref" and "\tx" columns are empty.

\id	\ref	\tx
Frog Races Fish		

- **Type “Race” into the \ref field.**
- **Type “Din todn” into the \tx field, and press Enter.**

A \ft field appears.

- **Type “The frog” into the \ft field, and press Enter.**

A \ref field appears.

- **Press Enter again.**

A \tx field appears.

- **Type “Don jlyn” into the \tx field, and press Enter.**

A \ft field appears.

- **Type “The fish” into the \ft field, and press Enter.**

A \ref field appears.

- **Press Enter again.**

A \tx field appears. You can see how easy it is to type text and free translation in this way.

Next we will use Text Renumber to fill in the references.

- **Choose Tools, Renumber Text.**
- **Click OK in the dialog box.**

The reference fields are all filled in and numbered.

\id	Frog Races Fish
\ref	Race.001
\tx	Din todn
\ft	The frog
\ref	Race.002
\tx	Don jlyn
\ft	The fish
\ref	Race.003
\tx	

This is an example of what it is like to type a new text directly into Toolbox.

- **Close Toolbox.**

4.20. Ambiguities

An ambiguous form is one that can have two or more meanings. In Toolbox you can have more than one dictionary entry with the same lexeme. Each entry represents one meaning. When an ambiguous form occurs in the text, Toolbox asks you to choose between the multiple meanings.

Exercise: Ambiguities

- **Open the exercise “25 Ambiguities”.**

You will see a new text titled “Frog Races Fish”.

- **Scroll down and read the free translation of the text.**
- **Interlinearize the first sentence.**

\ref	Race.001
\tx	Dij todj doj jlyj kelj eh?
\mb	d -i -j tod -j d -o -j jly -j *kel -j eh
\ge	the -1 -Obj frog -Obj the -2 -Obj fish -Obj **** -Obj Ques
\ps	det -g -case n1 -case det -g -case n2 -case **** -case part
\ft	Do you remember the frog and the fish?

- **Add “kel” to the dictionary with part of speech “v” and gloss “remember”.**

kelj	
kel	-j
remember	-Obj
v	-case

This word parses, but verbs cannot take case markers, so this is a wrong parse. It appears that "-j" on a verb means second person singular subject. So we want to insert a dictionary entry for "-j" as "2s".

- **Right click on "-j".**

The dictionary jumps to the existing entry for "-j". It didn't give us a chance to insert a new one. We will have to force it to let us do that by telling it to insert a new record.

- **Choose Database, Insert Record. It should default to inserting "-j" because the cursor was on that.**
- **Choose OK.**

You will see the Multiple Matches dialog box. It is saying that there already is a "-j".

- **Choose Insert.**

You will see a new entry for "-j".

- **Enter part of speech "pers" and gloss "2s".**
- **Return from jump (Ctrl+R) to interlinearize "kelj".**

You will see a dialog box titled Ambiguity Selection.



This is telling you that the affix "-j" is ambiguous between the two meanings shown. You can see that in the text the "-j" on "kelj" is highlighted.

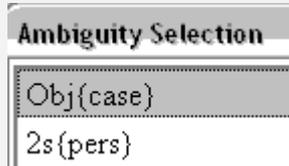
- **Double click on 2s{pers} to choose it.**

The verb now has the correct suffix.

```
kelj
kel      -j
remember -2s
v        -pers
```

- **Interlinearize sentence 2.**

The ambiguity box appears for the "-j" on "doj".



- **Double click "Obj{case}".**

\ref	Race.002
\tx	Din todn doj lyfch tap plapgoi.
\mb	d -i -n tod -n d -o -j lyfch tap plap -go -i
\ge	the -1 -Nom frog -Nom the -2 -Obj lily.pad on sit -DPst -1
\ps	det -g -case n1 -case det -g -case n postp v -tns -g
\ft	One day the frog was sitting on the lily pad.

4.25 Morphological Summary

- **Interlinearize sentence 3.**

The ambiguity box appears for the “-j” on “doj”.

- **Double click “Obj{case}”.**

The ambiguity box appears for the “-j” on “jlyj”.

- **Double click “Obj{case}”.**

\ref	Race.003
\tx	Doj jlyj bzervegonsi.
\mb	d -o -j jly -j bzerve -go -ns -i
\ge	the -2 -Obj fish -Obj see -DPst -Pnct -1
\ps	det -g -case n2 -case v -tns -asp -g
\ft	He saw the fish.

You can see that it will get very tiring to have to disambiguate this common suffix all the time. In the next exercise we will use word formulas to solve this problem.

- **Close Toolbox.**

4.21. Word Formulas

Word formulas describe the morphological patterns of words. Toolbox uses word formulas to reduce ambiguity.

Exercise: Word Formulas

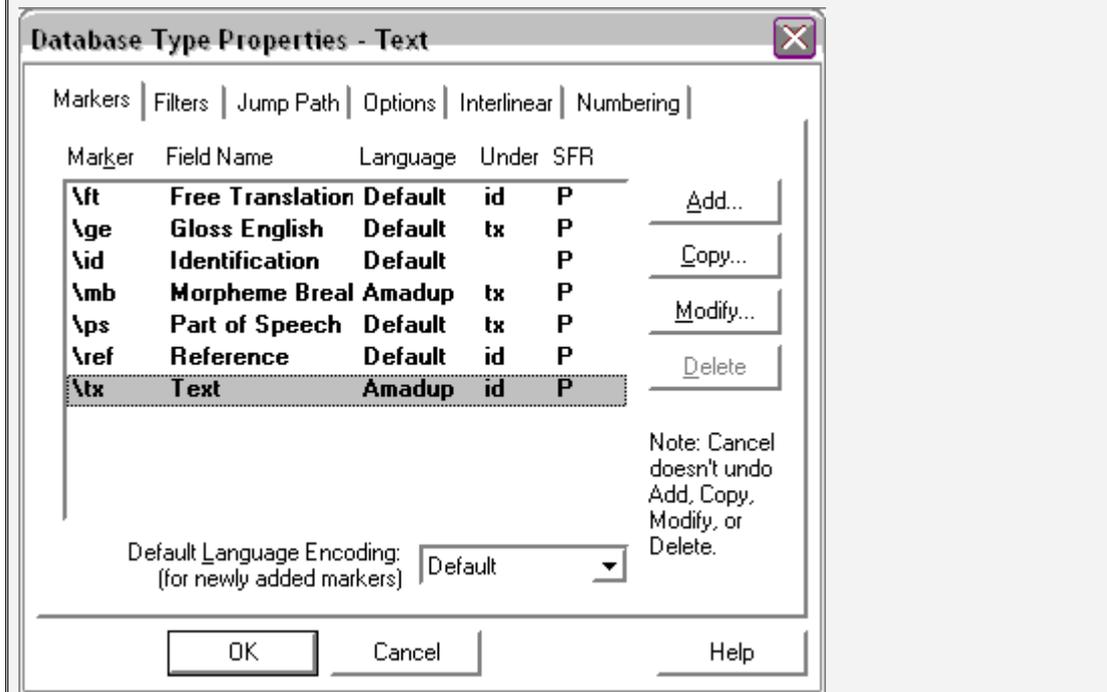
- **Open the exercise “26 Word Formulas”.**

You will see sentence 4 of the text.

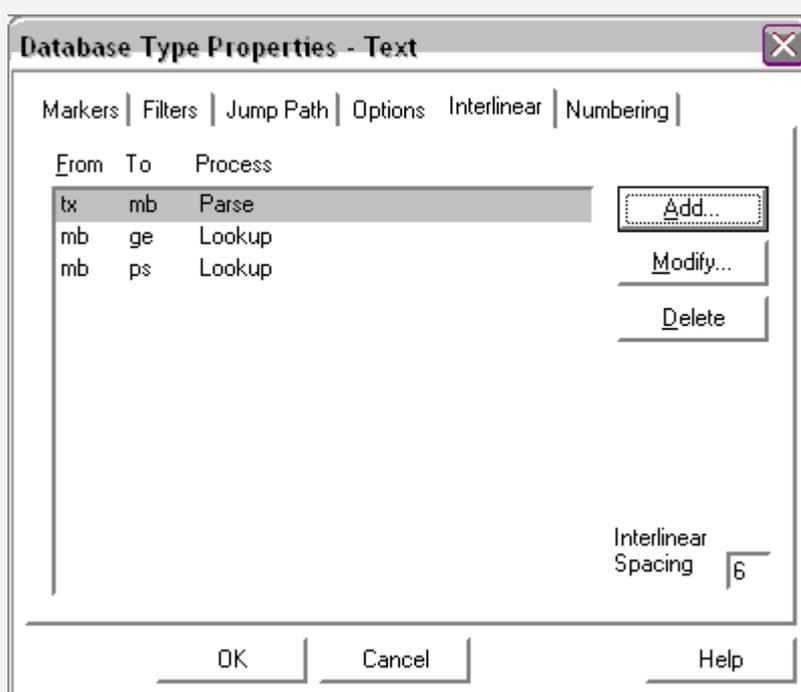
\ref	Race.004
\tx	Doj jlyj fo sezgonsi,
\ft	He said to the fish,

In order to use word formulas, we have to activate them.

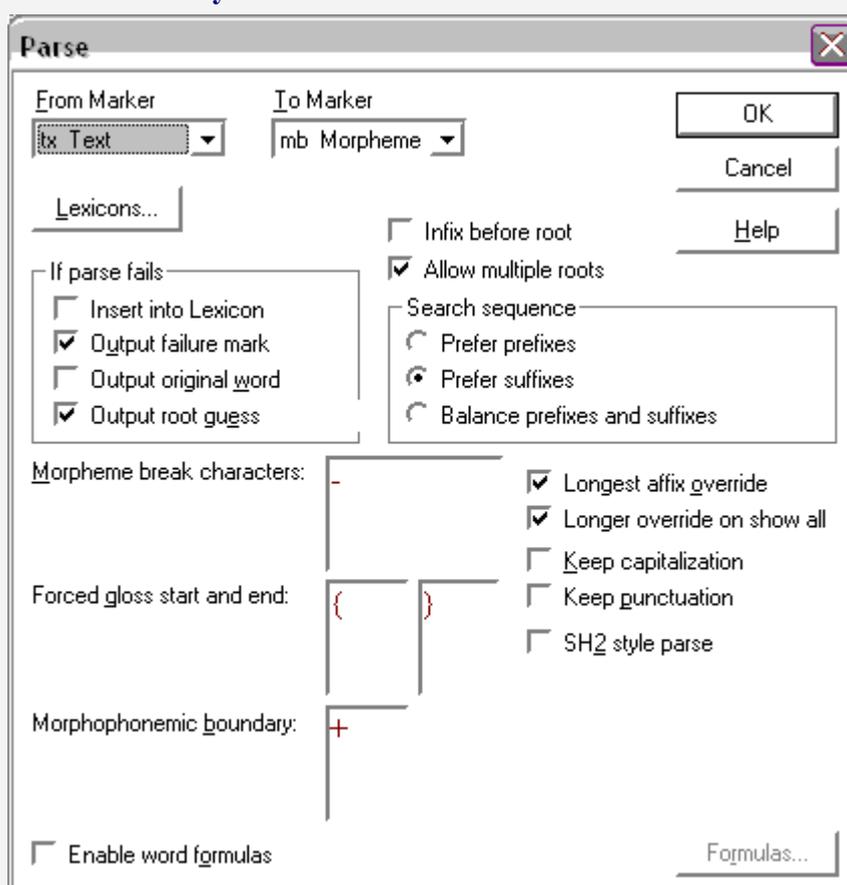
- **Choose Database, Properties.**



- **Click on the Interlinear tab.**



- **Click Modify.**



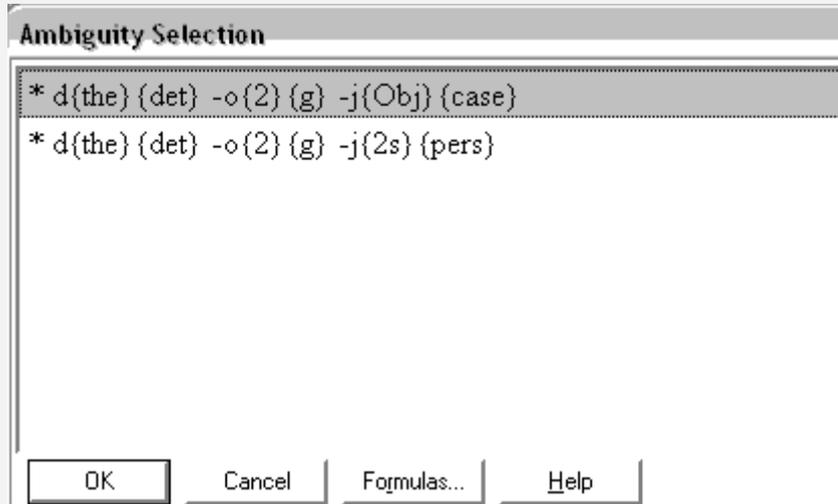
- **Click “Enable word formulas” to turn it on.**
- **Click OK.**
- **Click OK in the Database Type Properties box.**

You should be back to sentence 4 of the text.

\ref	Race.004
\tx	Doj jlyj fo sezgonsi,
\ft	He said to the fish,

- **Interlinearize.**

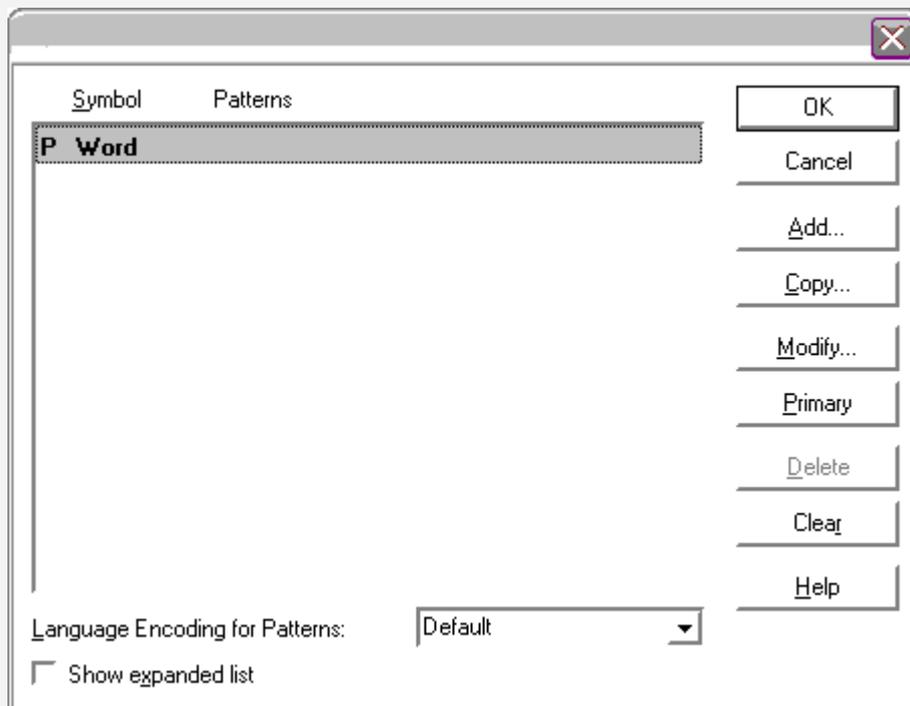
You will see the ambiguity box.



The two lines show two different analyses of the word “doj”. One has a case marker, and the other has a person marker. Both lines have a star at the front. This means that the analysis does not match a word formula. Since there aren’t yet any word formulas, they can’t match anything.

The case marker is correct. We will make a word formula to say this.

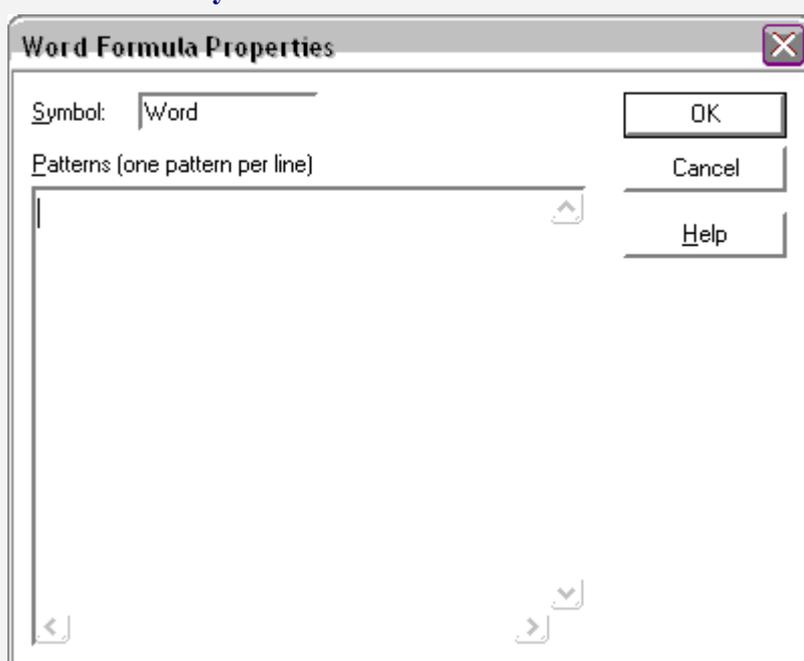
- **Click on Formulas.**



This says that the word formula set currently has only the symbol “Word”, and it has no patterns.

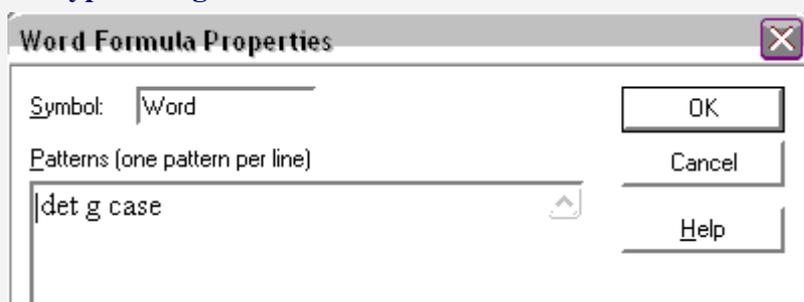
4.25 Morphological Summary

- **Click Modify.**



The determiner we were looking at has three parts, the determiner, a gender suffix, and a case suffix.

- **Type “det g case”.**

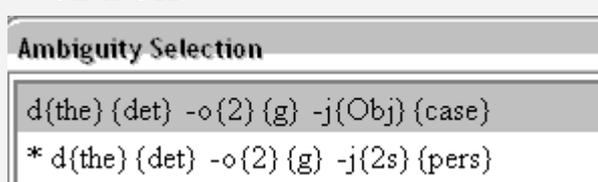


- **Click OK.**

Symbol	Patterns
P Word	det g case

The pattern we entered is show in the list of patterns.

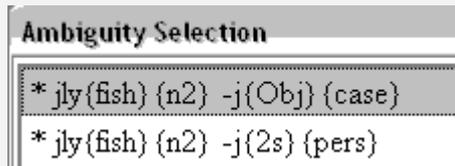
- **Click OK.**



Now the analysis with the case marker does not have a star in front. This shows that it matches a word formula.

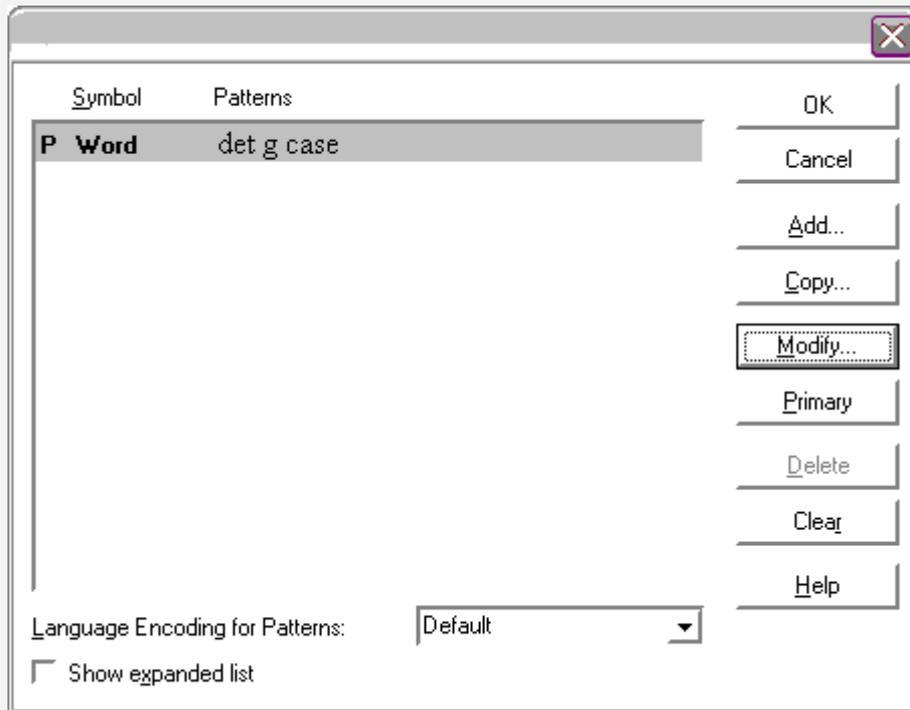
- **Click OK.**

Another ambiguity box appears, for the word “jlyj”.

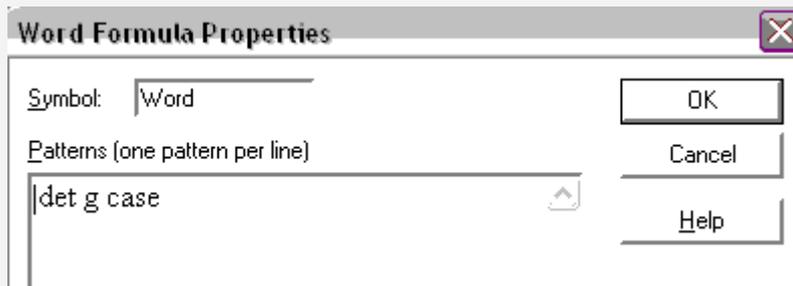


This shows that the “-j” on “jlyj” is ambiguous. Both lines have a star because we have not yet written a word formula for nouns.

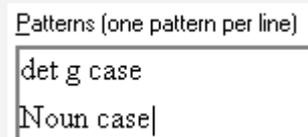
- **Click on Formulas.**



- **Click Modify.**



- **Press the “End” key to move the cursor to the end of the pattern.**
- **Press Enter.**
- **Type “Noun case”.**

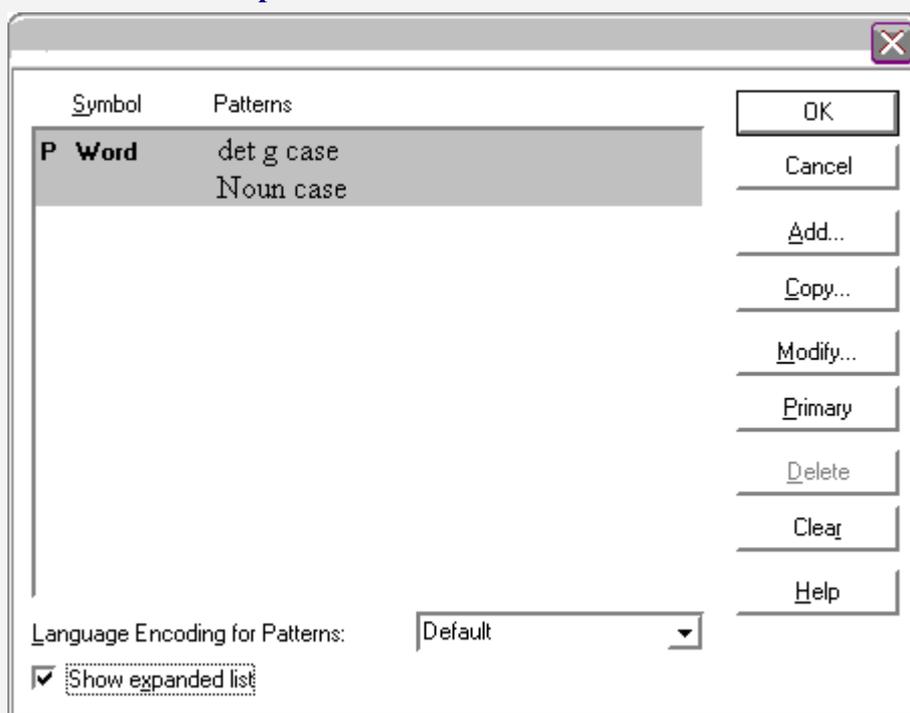


- **Click OK.**

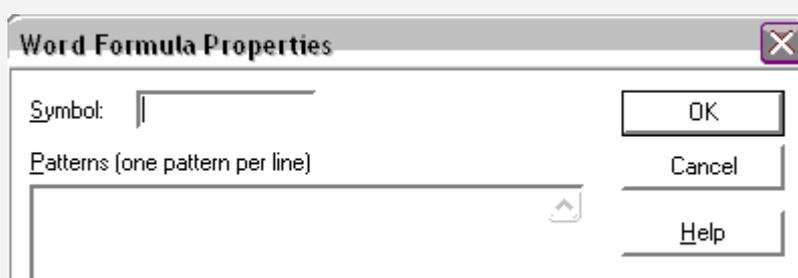
The word “Noun” is a symbol that we will define as any of the three noun genders. I like to use capital letters for symbols that are defined in other patterns.

4.25 Morphological Summary

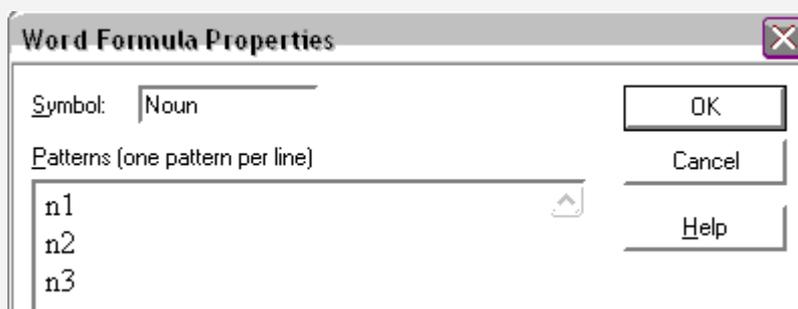
- Click “Show expanded list” to turn it on.



- Click Add.



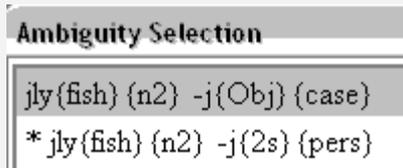
- Type “Noun” as the symbol.
- Move to the patterns box, and type “n1”, “n2” and “n3”, pressing Enter between each one.



- Click OK.

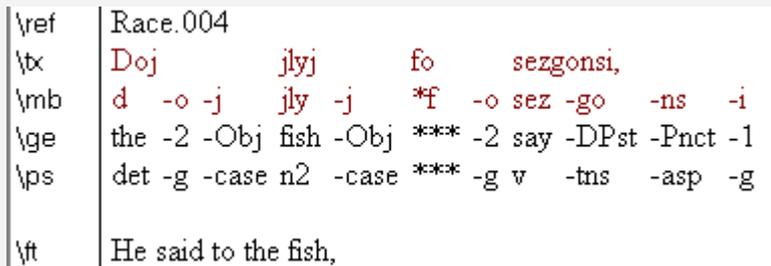


- **Click OK.**



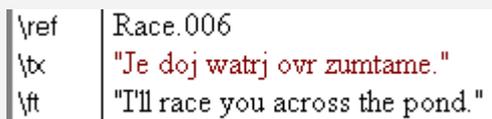
Now the analysis with the case marker does not have a star in front. This shows that it matches a word formula.

- **Click OK.**



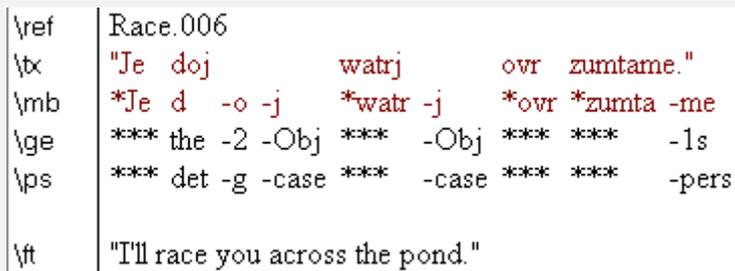
The next time Toolbox comes to a “-j” ambiguity on a noun or determiner, it will automatically choose the case marker. To see that in action, we will interlinearize another sentence.

- **Scroll to sentence 6.**



Without formulas, “doj” would bring up the ambiguity box. If the formulas work, it won’t ask.

- **Put the cursor in sentence 6 and interlinearize it.**



It analyzes “doj” without asking for ambiguity selection.

- **Close Toolbox.**

Exercise: Optional in Word Formulas

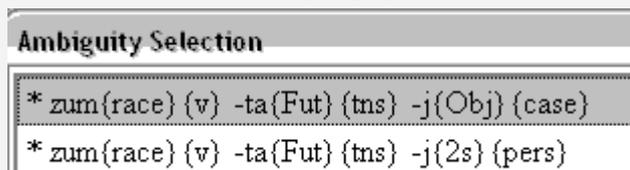
- **Open the exercise “27 Optional in Word Formulas”.**

You will see the text showing sentence 5.

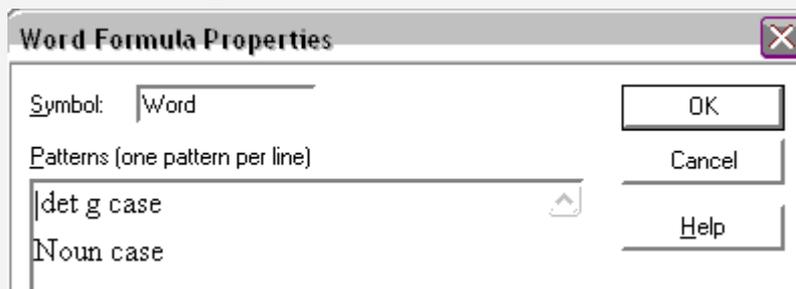
We have made formulas for nouns and determiners, but not yet for verbs. So “-j” will still show the ambiguity when it occurs on a verb.

- **Interlinearize.**
- **Add “zum” to the dictionary, with part of speech “v” and gloss “race”.**
- **Add “-ta” to the dictionary, with part of speech “tns” and gloss “Fut”.**

When you return from jump, you will see the ambiguity box.

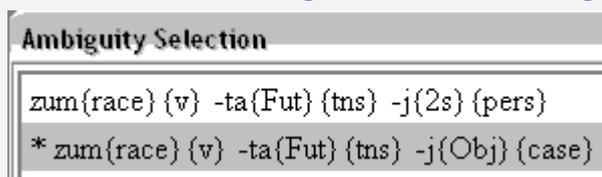


- **Click Formulas.**
- **Click Modify.**



We will add a formula for verbs. We will make the tense marker optional by enclosing it in parentheses (round brackets).

- **Add a formula of “v (tns) pers”.**
- **Click OK twice to get back to the ambiguity box.**



The line with “pers” no longer has a star. This means the formula is working.

- **Double click the line with “pers”.**

\ref	Race.005
\tx	"Zumtaj eh?"
\mb	zum -ta -j eh
\ge	race -Fut -2s Ques
\ps	v -tns -pers part
\ft	"How about a race?"

The sentence is now analyzed correctly.

- **Close Toolbox.**

4.22. Morphophonemics with Environments

Sometimes it is useful to specify the environment in which a morphophonemic change happens. Toolbox uses the combination of alternate form and underlying form to specify that. The next exercise shows how to do that.

Exercise: Morphophonemics with Environments

- **Open the exercise “28 Morphophonemics with Environments”.**

You will see the text showing sentence 12.

\ref	Race.012
\tx	Don jlyn zumy zumy wiglgomo.
\mb	d -o -n jly -n zumy zumy wigl - *gom -o
\ge	the -2 -Nom fish -Nom fast fast swim - *** -2
\ps	det -g -case n2 -case adv adv v - *** -g
\ft	The fish was swimming really fast.

Since the end of the previous text, I have added all the roots in this text, plus a couple of new verb affixes. One of them is iterative aspect “-em”.

The “gom” in “wiglgomo” comes from “-go” plus “-em”. The vowel of “-em” is dropped after another vowel. We will specify that in the dictionary entry for “-em”.

Lexeme	-em
Part of Speech	asp
Gloss English	Iter

The cursor is in the lexeme “-em” in the dictionary.

- **Choose Edit, Insert Field.**
- **Type “a” and press Enter.**
- **Type “-om” as the alternate form.**
- **Press Enter.**
- **An “Underlying” field is inserted automatically.**
- **Type “o+em” as the underlying form.**
- **Click in the word “wiglgomo” and interlinearize.**

wiglgomo.
wigl -go -em -o
swim -DPst -Iter -2
v -tns -asp -g

It succeeds. The parse shows that “-em” is the underlying form.

Look at the alternate and underlying fields in the dictionary entry.

Lexeme	-em
Alternate	-om
Underlying	o+em

The notation here is somewhat obscure, but it works. The plus sign in the underlying form says that “-om” might come from an underlying “o” plus “-em”. Toolbox help gives more information and examples of how to use this notation.

- **Close Toolbox.**

4.23. Concordance

Concordance lets you see all occurrences of a word in context.

Exercise: Concordance

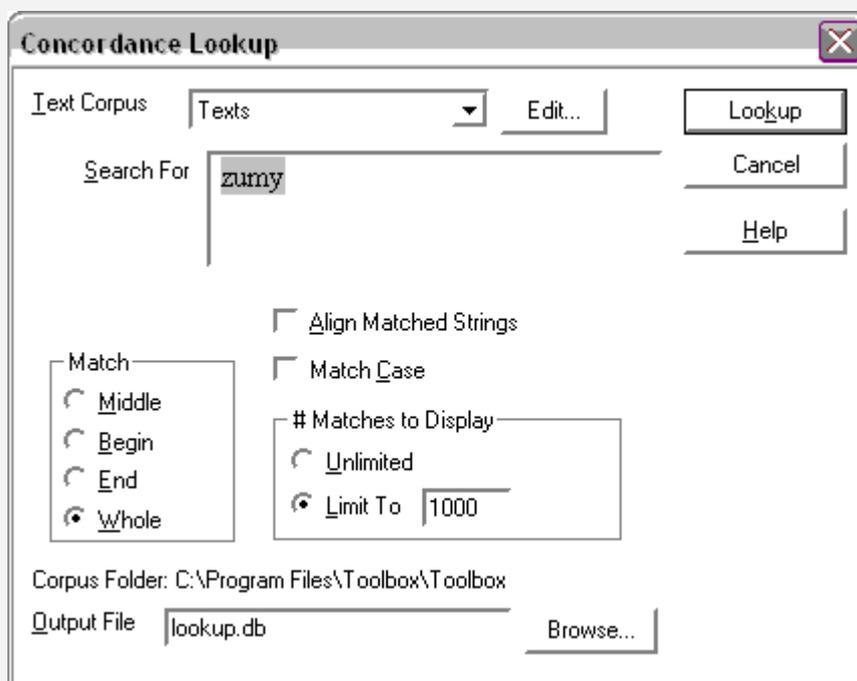
- Open the exercise “29 Concordance”.

You will see the text showing sentence 12.

```
\ref | Race.012
\tx | Don      jlyn      zumy zumy wiglgomo.
\mb | d  -o -n  jly  -n  zumy zumy wigl -go  -em  -o
\ge | the -2 -Nom fish -Nom fast fast swim -DPst -Iter -2
\ps | det -g -case n2 -case adv adv v -tns -asp -g
\ft | The fish was swimming really fast.
```

Concordance defaults to search for the current word. The cursor is in “zummy”.

- Choose Tools, Concordance.



This says it will make a concordance of all occurrences of the word “zummy”. You can see that there are some options, but for this time, the defaults are what we want.

- Click on the “Lookup” button.

You will see all the occurrences of “zummy” with surrounding context.

Reference	Before	Target	After
Race.008		"Zummy	wigl abelme.
Race.012	Don jlyn	zummy	zummy wiglgomo.
Race.012	Don jlyn zumy	zummy	wiglgomo.
Race.017	Doj holoj watrj ovr	zummy	zummy doshus doshus
Race.017	Doj holoj watrj ovr zumy	zummy	doshus doshus
Race.021		"Zummy	zummy wigltyj eh?"
Race.021	"Zummy	zummy	wigltyj eh?"

The text will follow the concordance.

- **Click on the top line of the concordance (or press up arrow).**

The text moves to show sentence 8.

- **Click on the last line of the concordance.**

The text moves to show sentence 21.

You can also do right click on a reference like in the word list. This will highlight the word in the text.

- **Right click on the first reference “Race.017”.**

The word “zummy” is highlighted in the text.

- **Right click on the second reference “Race.017”.**

The second “zummy” is highlighted in the text.

- **Close Toolbox.**

4.24. More Information on Interlinearizing

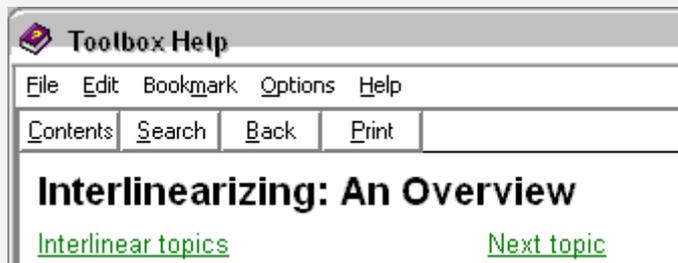
Toolbox help includes a lot of useful information on interlinearizing. It is organized like a document that you can read.

Exercise: Help on Interlinearizing

- **Open the exercise “29 Concordance” (same as the previous exercise).**
- **Choose Help, Contents.**
- **Click on “Interlinearizing”.**

You will see a table of contents of interlinear topics.

- **Click on “Interlinearizing: An Overview”.**



Each interlinear topic has a “Next topic” link. By following these links, you can read through the entire set of interlinear topics.

- **Close Toolbox.**

4.25. Morphological Summary

Toolbox can show you all your affixes in an organized way to help you make a summary of them. This is done by making a filter that shows only the affixes. Sorting the affixes by part of speech organizes them into logical groups.

Exercise: Morphological Summary

- **Open the exercise “29 Concordance” (same as the previous exercise).**

We have completely parsed two texts. We have learned a lot about the morphology and syntax of the Amadup language from just these two texts.

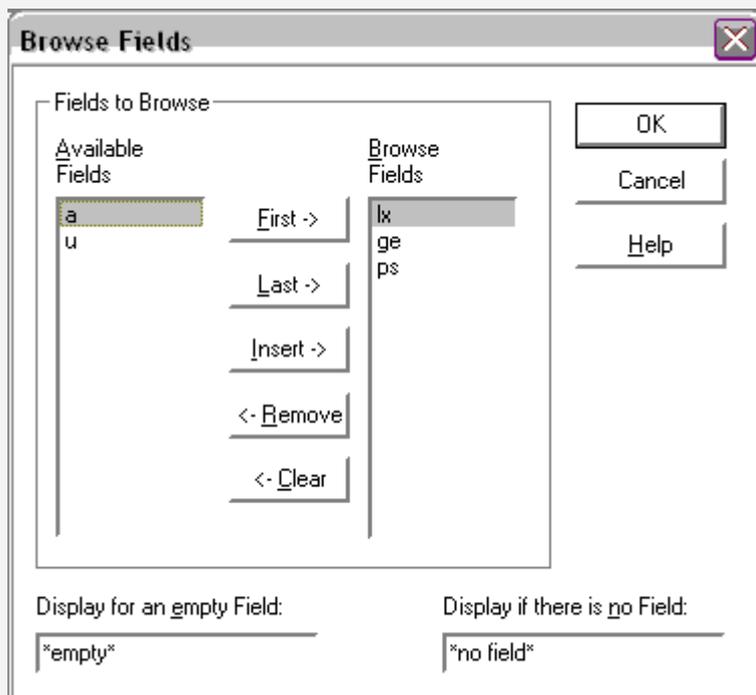
We will make a morphological summary of the affixes. To see this summary nicely, we will want a bigger view of the dictionary.

- **Click in the dictionary window to make it the active window.**
- **Choose Window, Duplicate.**

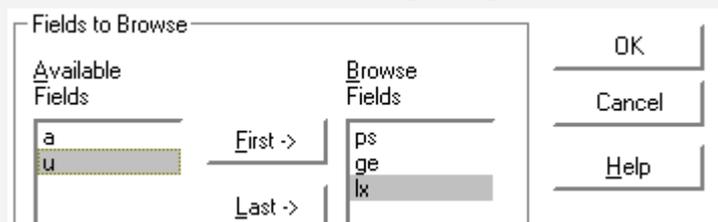
You will see a second, larger dictionary window.

Next we will set up the browse fields to show part of speech, then gloss, then lexeme.

- **Choose View, Browse Fields.**



- **Clear the browse fields.**
- **Insert fields in the order “ps”, “ge”, “lx”.**



- **Click OK.**

You will see the browse view.

Part of Speech	Gloss English	Lexeme
v	see	bzerve
det	the	d
adj	good	doshus
adj	wet	duky
part	Ques	eh
pron	3s	em
asp	Iter	-em
g	3	-et
adv	around	ewwer
adj	far	far
postp	to	fo
conj	when	gin
tns	DPst	-go

Next we will filter to show only the affixes.

In the upper right corner of the screen is the filter selection box.



- **Click in the filter selection box and choose “Affixes”.**

The window shows only affixes.

Part of Speech	Gloss English	Lexeme
asp	Iter	-em
g	3	-et
tns	DPst	-go
g	1	-i
case	Obj	-j
pers	2s	-j
pers	1s	-me
case	Nom	-n
neg	not	-na
asp	Pnct	-ns
g	2	-o
tns	Fut	-ta
tns	Pst	-ty

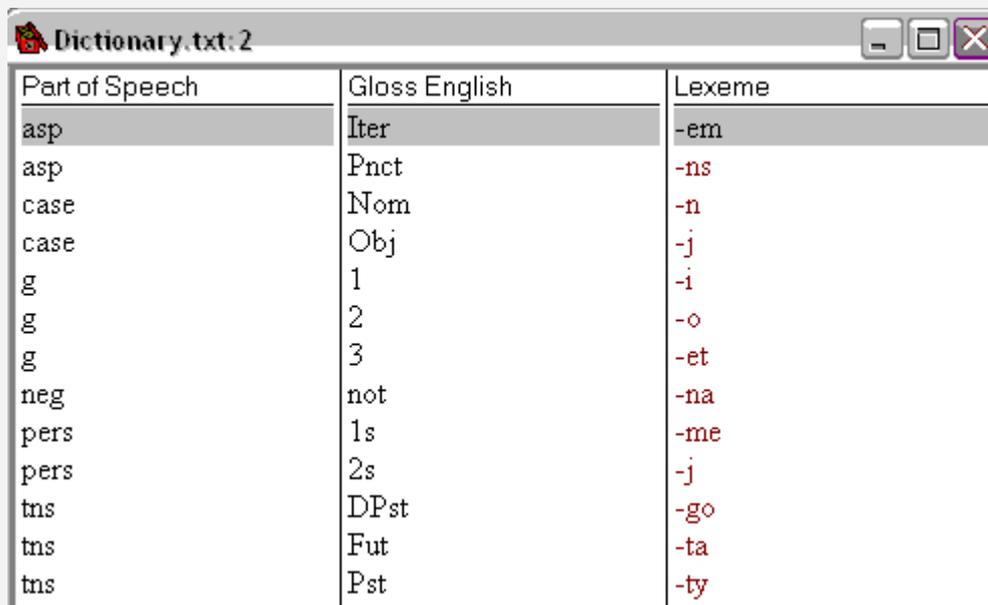
- **Click on the “Part of Speech” column.**

4.25 Morphological Summary

The affixes are shown grouped by part of speech. But the gender numbers are not in order. They need to be the secondary sort.

- **Click on the “Gloss English” column.**
- **Click on the “Part of Speech” column.**

The affixes are grouped by part of speech, and in each part of speech, the glosses are in alphabetical order.



Part of Speech	Gloss English	Lexeme
asp	Iter	-em
asp	Pnct	-ns
case	Nom	-n
case	Obj	-j
g	1	-i
g	2	-o
g	3	-et
neg	not	-na
pers	1s	-me
pers	2s	-j
tns	DPst	-go
tns	Fut	-ta
tns	Pst	-ty

There is no easy way to directly turn this into a chart in a document. But it would only take a small amount of typing to make a paradigm style chart.

Noun Suffixes:

Case: Nom -n

Obj -j

Gender: 1 -i

2 -o

3 -et

Verb Suffixes:

Tense: DPst -go

Pst -ty

Fut -ta

Aspect: Pnct -ns

Iter -em

Person: 1s -me

2s -j

From what we have seen in these texts, we might also make a short grammatical summary as follows:

Amadup is a head-final language with postpositions. It seems to be SOV. Nouns have gender and are marked with case. There are at least 3 genders. Determiners and adjectives agree with their head noun in gender and case. The main verb of a clause agrees with the subject in gender, or has a person suffix. Verbs may have tense and aspect suffixes.

▪ **Close Toolbox.**

As I am sure you have realized, I am the only speaker of the Amadup language. (Its name stands for “A Made-Up Language”.) I had great fun making these exercises. I hope you have found them interesting, fun, and enlightening. I hope you will enjoy using Toolbox and be very successful with it!

Alan Buseman