

## HELP ON TESTS

This document presents a complete description of the tests applicable to the **T<sub>logy</sub>**. It explains how to access the different tests available for all languages. It describes each test for its goals and the selection of relevant cases. Each test may be represented by a set of typical schemes, altogether being representative of the whole terminology.

This help file is the chapter 9 of the general Help book of the TAH website.

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## 9.1 Testing procedures

The software for generation of the different pages of the  $\mathbf{T}_{logy}$  website is complex, especially due to the fact that most of the terms are not explicitly present in the database and must be generated in the different languages starting from language independent universal formulas. Another factor for this complexity is the simultaneous presence of several vertical hierarchies (partonomy, taxonomy, TA98 hierarchy) and a network of horizontal links (expansions, vocabulary, properties) which govern the presentations. In such a situation, the need for testing procedures is a must.

There are three categories of tests which have been implemented. A first category concerns the vocabulary used for the generation of terms in multiple languages, actually Latin, English, French, Spanish and Russian, possibly extended to new languages. These tests are mainly syntactic tests about gender, number and case of the words. Because these tests are extended to the whole vocabulary, they become a reference to be consulted in presence of errors.

A second category tests the term generation, in regard of the several possible expansions used in the  $\mathbf{T}_{logy}$ . The tests are grouped with each type of allowed expansions. Each group is a set of typical cases, for which the answer given in advance is compared to the actual generated term.

A third category concerns the test of the universal functions, which must be multiple times implemented for the support of the languages in use for the  $\mathbf{T}_{logy}$ . Each universal function is individually validated for each language by such a battery of tests.

This document considers each individual test in turn and described the goals and their different aspects.

## 9.2 Management of tests

Once a group of tests has been prepared, it is run against the current database of the  $\mathbf{T}_{logy}$ . The results are collected in a single page for each language. As any page of the website, it is dated of the moment of the test in the lower right side of the page. This clearly means that the results are valid at this moment and could be theoretically invalidated by any operation of maintenance or development of the software.

Ideally, after each change to the software, the entire set of tests should be rerun. But practically, this is nearly impossible and the risk of creating an unexpected error is often evaluated to be low. Therefore, the action to rerun one or several tests is left to the authors of the software. If a part of the tests is rerun, and the new test pages are uploaded to the website, the new dates of the test pages act as signature.

Any users of the website may discover an error having escaped the attention of the authors of the  $\mathbf{T}_{logy}$ . They must feel free to contact the webmaster, giving a short pointer to the localization of the error. An adequate treatment is guaranteed, but one must be comprehensive with the delays when most people taking care of the website are working part time on a benevolent basis.

Internal test name	Latin	English	French	Spanish
TestNounGender	●		●	○
TestAdjGender	●		●	○
TestNounPlural	○	●	●	○
TestAdjPlural	●	●	●	○
TestNounGenSing	○			
TestNounGenPlur	○			
TestAdjGenSing	○			
TestAdjGenPlur	○			
TestNoExp	●	●	●	○
TestMandExp	●	●	○	○
TestOptExp	●	●	○	○
TestAdjExp	●	●	○	○
TestPrepExp	○	○	○	○
TestLatExp	●	●	●	○
UnivPlural	●	○	○	○
UnivLateral	●	○	○	○

Table 9.1: Access to any test procedure. There are presently 14 groups of tests in 4 languages, or 56 tests. At each intersection, the possible choice is threefold: a filled circle ● is an hyperlink to the available test, an empty circle ○ means that the test is not ready, but will be made available later, an empty space means that no test is intended to be made available there.

### 9.3 Accessing the tests

All the test procedures are accessible, either from the main menu of the website, or directly from the present help file.

The access from the website is not yet implemented.

A particular access from the website is possible through the direct access facility. This access obeys to the following conditions:

- Select Direct access in the main menu of the website ( or click [here](#)).
- In the leftmost combobox, select Test.
- In the middle combobox, select LAEN, the unique option currently available!
- In the rightmost combobox, enter the Internal test name (see table 9.1).
- Press return: you access the last run of the test.

The direct access from this file (a PDF file that you can save at any place of your choice) is performed by the hyperlinks made available in table 9.1.

## 9.4 Vocabulary tests

The vocabulary tests are controlling the syntax variations of the target language. All the different languages are governed by their specific grammar and variations of nouns and adjectives are to be considered in case, gender and number. But not all variations are present for all languages.

The vocabulary tests explore the rules and exceptions process, which is the core of the grammar implementation of the target language.

Each group of vocabulary tests is made of three distinct parts. In a first section, specific representative samples are selected and the generating programs are activated on them. Each result is compared with the expected result specified in advance.

In a second section, the rules used for the present test are given, as well as the list of exceptions.

In a third section, the set of all vocabulary items of the  $\mathbf{T}_{logy}$  are listed, showing the application of the rules and exceptions. This exhaustive approach allows two things: 1) a documentation of the vocabulary of the terminology; 2) a visualization of the used rules and exceptions process. It should be noticed that the list in this section is not necessarily correct, errors could be possibly interspersed elsewhere. If an error is present, it means that the rule and exception process must be adjusted!

### 9.4.1 Test of noun gender

Most languages define a gender for the nouns: Latin and Russian have 3 genders, French and Spanish have two genders. On the contrary, English does not have a noun gender, therefore this test does not apply to this language.

The usual determination of the gender is based on a rules and exceptions process. The rules are based on the rightmost characters of the word, which are assigned to a particular gender. A list of exceptions to the rules is added for all words with the same ending but a different gender. Because the endings are relatively well correlated to the gender of the noun, the list of exceptions is not too important. The order of the rules is significant.

The test for the Latin vocabulary, on the contrary of all other languages, is not based on a rules and exceptions process, but is directly issued from an existing specific Latin dictionary, dedicated to the domain of anatomy. When a word of vocabulary is defined in the  $\mathbf{T}_{logy}$ , and it is absent of the Latin dictionary, it appears with a gender value undefined.

When a rules and exceptions process is specified, as in French and Spanish, the test is presented in 3 sections: controled test, list of rules and free test. For Latin, only the free test is present.

The presentation of the controled test is the following:

- Title of the section.
- The first line is giving the actual number of entries.
- Each individual word is presented with 3 items.
- On the left column, the word itself at singular is displayed.
- On the right column, a first item is the gender.

- A second item is the justification of this result, either the number of the applied rule, or the mention of an exception.
- The last line gives a message of success or the number of failures.

The presentation of the rules is the following:

- Title of the section.
- The first line is giving the number of rules.
- Each individual rule is specified with two items.
- On the left column is given the ending of the word.
- On the right column is given the gender.
- When no rule applies, the default gender is applied.

The presentation of the free test is the following:

- Title of the section.
- The first line is giving the actual number of entries.
- Each individual word is presented with 3 items.
- On the left column, the Unit ID of the vocabulary entity is displayed with a link to its Unit page.
- On the right column, the first item is the word itself at nominative singular.
- On the right column, the second item is either the gender or the qualifier undefined.
- The last lines give a statistical analysis of the content of the file.

The unit identifier with its hyperlink allows to access the Unit page of the vocabulary entity. Such a page contains an exhaustive list of all occurrences of the actual word and its equivalent words (nouns, adjectives and prefixes). This feature gives very precisely the importance of this word in the  $\mathbf{T}_{logy}$  as well as complementary words with a similar meaning.

The qualifier undefined appearing with certain words in Latin means that this word is absent from the Latin dictionary from which this test is conducted. If this word is actually used in the terminology, the Latin dictionary must be updated. However, it is possible that this word is currently not in use.

#### **9.4.2 Test of adjective gender**

#### **9.4.3 Test of noun plural**

Most languages have a different form for the singular and plural of nouns. This test considers all the nouns of the target language and verify that the plural is correctly generated from the singular form.

#### **9.4.4 Test of adjective plural**

Most languages have a different form for the singular and plural of adjectives. This test considers all the adjectives of the target language and verify that the plural is correctly generated from the singular form.

In English, adjectives are invariable in number and this test seems to be unnecessary. However, it is considered useful because it provides a exhaustive list of the active adjectives of the  $\mathbf{T}_{logy}$  together with a link to their generating vocabulary entity.

#### **9.4.5 Test of noun genitive**

#### **9.4.6 Test of adjective genitive**

## 9.5 Generation tests

The generation tests represent a survey of the generating programs in charge of building the terms of the  $\mathbf{T}_{logy}$ . They are mainly classified by the type of expansions that they realize.

The generation tests are specified in the **Unit XXProc** defining the class of the language term **tXXterm = class( tTerm )**; Each test is specified as an array of N cases (N is a constant Nb...XX defined at top of this unit), with each case being a pair of two values: the first value is the entity identifier of the present case, the second value is the tested aspect, as defined for each group of tests (see below).

The presentation of each group of tests is the following:

- Title of the section.
- The first line is giving the number of individual tests.
- Each individual test is presented in sequence.
- On the left column, the Unit ID of the term is displayed with a link to its Unit page. In addition, the aspect ordinal is provided, referencing the present document, see the description of each group of tests.
- On the right column, a first part gives the generated term if successful. If it is a failure, a message is issued with the wrong term and the expected term.
- A second part is optional. It is a comment about this individual test.
- The last line gives the result, either all tests successful, or the number of failures.

An example corresponding to the French group of terms without expansion is given in figure [9.2](#).

### 9.5.1 Test of terms without expansion

A term may be limited to its base part, without expansion. This group of tests allows the testing of the various aspects of the base part, in direct application of the formal grammar described elsewhere.

This group of tests considers several aspects, which are applicable to all languages, but not all languages having necessarily an application. Each individual test mentions one aspect that it is testing. When the same test applies to several aspects, it may be repeated with all of them. These aspects are presented below:

**Aspect 1:** Noun alone at singular.

**Aspect 2:** Term without noun at nominative.

**Aspect 3:** Noun with adjectives at singular.

**Aspect 4:** Noun with a prefixed adjective at singular.

**Aspect 5:** Prefixed noun.

**Aspect 6:** Noun alone at plural.

**Aspect 7:** Noun with adjectives at plural.

**Aspect 8:** Term with invariant.

**Aspect 9:** Apposition of two nouns.

**Aspect 10:** Term with a noun complement.

**Aspect 11:** Language specific situation.

**Aspect 12:** Test not attributed.

An example of this group of tests is given for the French language in figure 9.1, directly extracted from the source unit for that language. One can observe the occurrence of most of the aspects described above. The run of this test is visible [here](#) for French. The equivalent tests for other languages are also available: [Latin](#), [English](#), [Spanish](#).

The resulting test page for the above figure is given in figure 9.2.

```

cNoChExpFR:      // Test of terms without expansion
                  tNoChExpFR = (
                    ( 5264, 1 ),      // télencéphale
                    ( 10, 2 ),       // latéral
                    ( 6005, 3 ),     // gyrus angulaire
                    ( 7670, 3 ),     // neurone ganglionnaire nain
                    ( 7044, 3 ),     // anneau tendineux commun
                    ( 8088, 3 ),     // méat acoustique externe osseux
                    ( 7816, 4 ),     // loge infratentorielle
                    ( 27570, 5 ),    // myoépthéliocytes fusiformes
                    ( 7053, 6 ),     // paupières
                    ( 38406, 7 ),    // gyrus cérébraux (paire)
                    ( 5184, 8 ),     // lame spinale V
                    ( 1651, 9 ),     // muscle sphinctère
                    ( 6274, 10 ),    // fibres d'association courtes

```

Figure 9.1: This is an example of a group of tests for terms with no expansion in French. Similar groups are available for all implemented languages. Each single test is specified by two parameters: an entity identifier and a reference to the underlying aspect. Free comments are given in the right margin.

```

▼ TEST DE TERMES SANS EXPANSION
taille du test  14 entrées
5264 A1 télencéphale
Terme d'unité simple. Ce terme est formé d'un nom unique qui reste inchangé.
10 A2 latéral
Terme adjectif simple présenté au masculin singulier.
6005 A3 gyrus angulaire
Terme générique d'une unité paire. Ce terme est formé d'un nom suivi d'un adjectif
qui restent inchangés.
7670 A3 neurone ganglionnaire nain
Terme générique d'une unité de type pset. Ce terme est donc au singulier. Ce terme
est formé d'un nom et de deux adjectifs qui restent inchangés.
7044 A3 anneau tendineux commun
8088 A3 méat acoustique externe osseux
7816 A4 loge infratentorielle
8141 A5 myoépthéliocytes fusiformes
Terme ensemble générique d'une unité pset formé d'un nom avec un double préfixe,
le tout suivi d'un adjectif, au pluriel.
7053 A6 paupières
Terme ensemble générique d'une unité pset au pluriel.
5973 A7 gyrus cérébraux (paire)
Terme spécifique d'une unité pset, au pluriel.
5184 A8 lame spinale V
Terme avec un invariant.
1651 A9 muscle sphinctère
Terme formé d'une apposition simple de deux noms, tous les deux restant au
nominatif singulier.
1929 A10 fascia propre d'organe
Terme avec un adjectif suivi d'un complément de nom.
6274 A10 fibres d'association courtes
Terme ensemble générique avec un complément de nom au génitif, ainsi que d'un
adjectif qui s'accorde avec le nom nominatif. Une ambiguïté résulte du fait que
l'adjectif ne s'accorde pas avec le nom qui le précède.
résultat tous les tests sont positifs

```

Figure 9.2: This is the result of the tests of terms without expansion for French. An equivalent presentation is available elsewhere in different languages.

Page of language test in Latin, work in progress		
Test for mandatory expansion		
SECTION	label or identifier	value or descriptive text
▼ CONTROLLED TEST FOR MANDATORY EXPANSIONS		
	size of test	6 entries
	<a href="#">3834</a> A1	ramus septi nasi
	<a href="#">5973</a> A2	gyri cerebri
	<a href="#">6085</a> A3	radiatio corporis callosi
	<a href="#">13172</a> A3	tractus commissuralis hippocampi
	<a href="#">5142</a> A3	pars spinalis filii terminalis
	<a href="#">12294</a> A3	fasciculus prosencephali medialis ascendens
	result	all tests succesful
		Date: 29.04.2023
FEDERATIVE INTERNATIONAL PROGRAMME FOR ANATOMICAL TERMINOLOGY Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0)		

Figure 9.3: This is an example of a group of tests for terms with mandatory expansions in Latin. Equivalent tests for other languages are available somewhere.

### 9.5.2 Test of mandatory expansion

Quite frequently in the  $T_{logy}$ , terms are formed with a base part accompanied by an mandatory expansion. This group of tests is dedicated to different forms of mandatory expansions.

This group of tests considers several aspects, which are applicable to all languages. Each individual test mentions one aspect that it is testing. When the same test applies to several aspects, it may be repeated with all of them. These aspects are presented below:

- Aspect 1:** Noun alone in the mandatory expansion.
- Aspect 2:** Noun alone with a composite mandatory expansion.
- Aspect 3:** Composite base part with a single mandatory expansion.
- Aspect 4:** Composite base part with a composite mandatory expansion.
- Aspect 5:** Mandatory expansion with a second mandatory expansion.
- Aspect 6:** Mandatory expansion with an optional expansion.

An example of this group of tests is given for the Latin language in figure 9.3, directly extracted from the source unit for that language. One can observe the occurrence of most of the aspects described above. The run of this test is visible [here](#) for Latin. The equivalent tests for other languages are also available: [English](#), [French](#).

### **9.5.3 Test of optional expansion**

### 9.5.4 Test of adjective expansion

The adjective expansion is an expansion on an entity represented by an adjective. This is possible when the vocabulary unit containing the adjective has been declared as representative of this entity. The adjective expansion may be accompanied by a prefix expansion with the same condition for the prefix.

The adjective expansion differs from an adjective in the base part of the term, in the sense that it is specified by an anatomical entity and not by a vocabulary entity. If both specifications result in the same result, the adjective expansion is always to be preferred, because it specifies an horizontal link within the  $\mathbf{T}_{logy}$  like the other expansions.

In practice, it can be observed that different languages are mixing the adjective and the mandatory expansion. Such a situation is issued from the tradition valid for each language and therefore it should be accepted. However, on a formal point of view, the replacement of a noun by an adjective is not without importance. Strict recommendations do exist for the selection of a noun (in presence of a partonomic link) or an adjective (in the presence of a non partonomic relation). In the  $\mathbf{T}_{logy}$ , an inheritance mechanism allows to obtain the other solution from a universal formula, making this formula valid for both situations.

An example is necessary to illustrate the above problem. Let consider the *LA: rami pharyngei* which are translated to *EN: pharyngeal branches* ou *FR: rameaux pharyngiens*. The Latin version prefers a noun and the other languages prefer the adjective. Here, the formal recommendation is to use the adjective, because the arteries and their branches are part of the cardiovascular system, not part of the pharynx! The Latin genitive somewhat implies the part\_of relation and must preferably be avoided in favor of the adjective. Consequently the Latin version is not the best solution and here should not be the model for other languages.

This group of tests considers several aspects, which are applicable to all languages, but not all languages having necessarily an application. Each individual test mentions one aspect that it is testing. When the same test applies to several aspects, it may be repeated with all of them. These aspects are presented below:

**Aspect 1:** Noun alone at singular with a single adjective expansion.

**Aspect 2:** Noun alone at singular with a double adjective and prefix expansion.

**Aspect 3:** Noun with a mandatory expansion inherited from an adjective expansion.

**Aspect 4:** Adjective expansion with prefix plus a distinct adjective.

**Aspect 5:** Adjective expansion at singular plus a mandatory expansion.

**Aspect 6:** Adjective expansion at plural plus a mandatory expansion.

**Aspect 7:** Adjective expansion with distinct adjectives in the base part.

**Aspect 8:** Adjective expansion at plural with distinct adjectives in the base part.

**Aspect 9:** Noun alone at plural with a double adjective and prefix expansion.

**Aspect 10:** Noun with an adjective expansion inherited from a mandatory expansion.

This group of tests is present in all languages.

### **9.5.5 Test of preposition expansion**

A preposition expansion is a kind of mandatory expansion, but using a preposition instead of the genitive form. This category of expansion is not yet implemented.

### **9.5.6 Test of lateral expansion**

A lateral expansion is an expansion exclusively reserved to a bilateral term into one of its two lateral members, the left member or the right member. This expansion simply results in the adjunction of the lateral adjective at the correct position, with satisfaction of the syntactic constraints of the target language.

The correct position is controlled by a universal rule applicable to all languages, described elsewhere. Such a rule is considered to have no exception and therefore the correct position is known without possible discussion. The generating programs must only apply the rule.

## 9.6 Universal tests

The universal tests are the tests which directly activate the universal functions and validate them for their correct expected treatments. These tests are designed for all languages and act as a guarantee about the good behavior of these functions. The tests are systematically designed for each universal function and usually contain several trials. They can be rerun at any time when some suspicion appears about the universal functions after some episode of updates or maintenance. In case of implementation of a new language, the tests are of evident interest for an initial validation.

There are 14 universal functions and 3 universal procedures. The 14 universal functions can be directly activated with visible results to be compared with the stored expected results and therefore are ready to be tested. The procedures are acting in the background and will not be tested by an explicit test, but indirectly through the universal functions. These procedures are the following: UnivSetLateral results in a preparation of the term for a subsequent generation of the lateral adjectives and will be simultaneously tested with the function UnivLateral; UnivSetNominative; UnivSetFormula. The description below is a recapitulation issued from the chapter 6 of the Book on Universal Terminology: it shows the 14 universal tests together with a brief explanation of the role of each universal function.

**UnivPlural:** Transformation of the base part of a term to nominative plural.

**UnivLateral:** Adjunction to a term of a lateral adjective at the correct location.

### 9.6.1 UnivPlural

This function transforms the nominative singular part of a term - its base part - to nominative plural and leaves unchanged the expansions. The test considers in turn different situations of complexity of the base part and try to cover all possible variations.

A difficulty arises in Latin when a genitive mandatory expansion is inserted in the middle of the base term: the mandatory expansion must be left unchanged, but the parts on the base term at the left and at the right of the expansion are variable at plural.

In the presence of an adjective expansion, such an expansion remains at nominative as a part of the base term and consequently it must be considered for plural for most languages.

The lateral adjectives, when located in the base part at nominative are evidently candidates to a modification for the plural.

### 9.6.2 UnivLateral and UnivSetLateral

This function just adds the left or right adjective at the correct location in the term, but this location is dependent on the presence or not of pairs for the base part and all of its expansions: only a pair entity can receive a lateral adjective. The universal rule without exception for the determination of this location is the rightmost pair entity, valid for all languages.

This test also implies the validation of the universal procedure `UnivSetLateral`, which is responsible to position placeholders at the locations of the possible lateral adjective. Such placeholders defined both the correct position and the expected syntax of the lateral adjectives.

A particular situation arises with the optional expansion. In this case, the lateral adjective may have two locations, depending on the presence or not of the expansion and on the bilaterality of this expansion: two placeholders are then inserted in the term and the `UnivLateral` function must be able to select the good one.

### **9.6.3 UnivGender**

This function adjusts the base term as generated by the procedure `UnivSetFormula` to the point of view of the syntax of adjectives related to the main noun of the base term. Such a process is necessary in several modern languages, but not in English where the adjectives are invariable.

Latin and Russian have three values for gender: masculine, feminine and neuter. In French and Spanish, only the first two values are present.

### **9.6.4 UnivMakeMandat**

This universal function is tested by the test on mandatory expansion.

### **9.6.5 UnivMakeOption**

This universal function is tested by the test on optional expansion.

### **9.6.6 UnivMakeAdjective**

This universal function is tested by the test on adjective expansion.

## 9.7 Log of updates

**05 April 2023** Creation of the file.

## 9.8 Credentials

This document is part of the help system accompanying the website on Terminologia Anatomica. It expresses the vision of the authors of the terminology about its content and its form of presentation. Despite it is as exact as possible, close to the reality of the database of the terminology and the surrounding software, approximations, errors and ambiguities are possible and should be considered as independent of their willingness and intents.

Identified comments about the content of the website and its presentation are welcome. An appropriate answer will be given when pertinent.

Authentic URL of this file: <https://ifaa.unifr.ch/Public/TNAEntryPage/help/HelpTestPage.pdf>