

Appendices

Appendix I

The Structural Test:

A1 Simple tense

Correct the verbs between brackets.

A.

1. A statistician (apply) mathematics in his work.
2. You (accept) incomplete evidence?
3. They (perform) the experiment correctly.
4. The scientist (not) finish the test.

B. Change the following int future.

1. The liquid (rose) inthe tube.
2. The electric motor (drives) a pump.
3. They (became) famous scientists?
4. I (find) the ratio between the numbers.

Appendix II

The functional Test

A. Simple tense

Expand the following into full definitions; or cause and effect.

1. Wilting in plants/lack of water.
2. The diffusion of Co₂/the entry of Co₂ into the cell.
3. The deeper layer of the skin/dermis
4. The largest artery in the body/elastic aorta.

Modals

B. Modals.

Fill in the blanks so as to expres definitions or cause and effect.

1. Dermis..... the deepr layer of the skin.
2. The entry of CO₂ into the cell/... the diffusion of CO₂.
3. Lack of water wilting in plants.
4. The largest artery in the body.... elastic aorta.

2. It is important to explain to the learners that the simple tense and modals could express various scientific functions. Also, emphasis has to be placed on the fact that past and present simple tense and modals may carry different semantic implications.

3. While the present simple tense and its past carry different semantic implications, no such great distinction can be noticeable between past and present forms of modals. However, a big difference in meaning exists when the simple tense and modals are used to express CES.

4. Teachers of ESP/EST should bear in mind that the level tackled in this paper is that of "textbook" This the semantic implication of simple and modals is restricted here to such level of scientific writings compared with highly specialised articles.

Selected references

- Ewer, J.R. and G. Latorre. *A Course in Basic Scientific English*. Longman (1967) .
- Hawkins et al *English Studies series*, 7. OUP (1973)
- Hazim, M. *Tense and Aspect in EST*. Mosul Univ., 1981 (unpublished M.A. thesis)
- Widdowson, H G "Teaching English as Communication" in *ELT Journal*, XXVII. No. 1, 1972.
- *Teaching Language As Communication*, OUP, 1978
- *Exploration in Applied Linguistics*, OUP, 1979.

Technique V:

Here the students depend on their scientific knowledge to complete the exercise. The technique, though involving no actual language activity arouses students interest particularly when they find that what they read in the EST class is directly relevant to what they read in their science classes.

A. The simple present tense:

1. refers to the fibres carrying impulses from the central nervous system.
2. The fibres which carry impulses from the central nervous system are called
system are called
3. causes niacin deprivation.
- 4 . Niacin deprivation is caused by

B. The modals.

1. may refer to the fibres carrying impulses from the central nervous system.
2. The fibres which carry impulses from the central nervous system might be called
3. can cause niacin deprivation.
4. Niacin deprivation can be caused by

Recommendations:

1. In teaching tenses and modals for learners of science and technology, attention should be paid to their use value as an aspect of language comprising both linguistic and communicative properties. In such a way ESP/EST teaching will both language and subject oriented.

B. The modals:

Fill in the blanks using one of the forms below: may be called, may be known as, may refer to, can lead to, can cause, may be called.

1. Efferent fibres the fibres carrying impulses from the central nervous system.
2. The fibres carrying impulses from the central nervous system ... efferent fibres.
3. Pellagra ... deprivation of niacin.
4. Niacin deprivation ... Pellagra.

Technique IV:

It is based on Technique III. The verb forms are missing and the students are asked to use the correct form to express cause and effect or definition.

A. The simple tense:

Complete the following diagrams with suitable verbs so as to express either definitions or causes and effects.

A. The simple present tense:

1. Efferent fibres/the fibres which carry impulses from the central nervous system.
2. The fibres which carry impulses from the central nervous system/ efferent fibres.
3. Pellagra/ niacin deprivation
4. Niacin deprivation/ Pellagra.

B. Themodals:

1. Efferent fibres/the fibres which carry impulses from the central nervous system

Technique II:

2. The fibres which carry impulses from the central nervous system/ efferent fibres.
3. Pellagra/ niacin deprivation.
4. Niacin deprivation/ pellagra.

Technique III:

This technique helps students understand the fact that one concept could be put in various forms. This involves distinctions between the different forms used to express Ds and CEs.

A. The simple present tense:

Fill in the blanks, using one of the forms below:

refers to, is called, is known as, causes, is caused by, lead to/ is named, is.

1. Efferent fibres... ... the fibres carrying impulses from the central nervous system.
2. The fibres carrying impulses from the central nervous system efferent fibres.
3. Pellagra niacin deprivation.
4. Niacin deprivation Pellagra.

Technique: I

This technique is designed to help the students distinguish between Ds and CEs and how the simple tense and modals are used to express them.

Take expression from list(A) and add them to appropriate expressions from list (B) or vice versa, so as to form sentences expressing either definition or cause and effect:

The Simple Present Tense

A List

List B

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- | | |
|--|-----------------------|
| 1. The fibres which carry impulses to the nervous system | 1. niacin deprivation |
| 2. Lack of water | 2. Histology |
| 3. The study of the microscopic structure | 3. Wilting in plants |
| 4. Pellagra | 4. efferent fibres |

The Modals:

List A

List B

-
- | | |
|--|-----------------------|
| 1. The fibres which carry impulses to the nervous system | 1. niacin deprivation |
| 2. Lack of water | 2. Histology |
| 3. The study of the microscopic structure. | 3. wilting in plants |
| 4. Pellagra | 4. efferant fibres |

Technique II:

This technique helps the students expand lexis, phrases and clauses into full sentences. In such a way the students will be able to understand how various structural forms of VP are used to express these functions.

Expand the following into full sentences so as to express either definitions or causes and effects.

in meaning between Ds expressed through the simple present tense and those expressed through the modals.

However, it must be noted that different semantic implications exist between CEs expressed through the modals and those expressed through the simple tense. Consider the following examples:

a. Niacin deprivation may cause/ may lead to/can produce/ may result in plagra.

b. Pellagra can be caused by/may be produced by/ can lead to niacin deprivation.

In discussing CE it is obviously important for the instructor and the learner to distinguish between cases or experiments where there are a number of possibilities. This is why the modals are used in the sentences above. The choice of modals rather than the present tense depends on the extent of one's medical, biological, .. etc. knowledge. If a person, for example, knows of another cause of pellagra, he would introduce the modals. Thus they are frequently found in those experimental, clinical works largely connected with medicine, biochemistry, biology compared with those established as permanent, such as mathematics.

4. Suggested techniques

The above discussion shows that the introduction of the use value of the simple tense and modals is necessary at the tertiary level of education. Therefore the design of a number of techniques primarily meant to develop students's competence of the communicative aspects of both simple tense and modals will be of help at this stage. The following techniques, devised by the author for Biology freshers have been found helpful to increase the learners understanding of the communicative aspects of the simple tense and modals as they are expressed in Ds and CEs.

level. A scientist 'however' would use the simple past in the instances which are still experimental in nature, unpermanent or are the only ones being reported. The simple past is also frequently used in highly specialised articles while the simple present is reserved for textbook level writings (11).

3.2. The modals

Modals such as "will, would, can, could, may, might, etc." are used to express both Ds and CEs in EST. Ds through the use of modals may take the following forms:

a. Efferent fibers may refer to/ can refer to./the fibers which (that) carry/ carrying impulses from the central nervous system.

b. The fibers which (that) carry / carrying impulses from the central nervous system may be defined as/ can be known as/ may be termed/ can be named/ efferent fibers.

c. Efferent fibers might refer to/ could be used for/the fibers which (that) carry/ carrying impulses to the central nervous system.

d. The fibers that (which) carry/ carrying impulses to the central nervous system might be defined as/ could be known as/ might be termed/ could be named/ efferent fibers.

Ds such as those mentioned above, whether nominal or real, past or present are frequently found in scientific writings. It is important to note here that the use of the modals, in addition to being implications of pure "futurity", "probability" or "ability", they are primarily used for the purpose of instruction, i.e. learning purposes. Thus, there is little difference

(11) See for example Aubrey Gorbman' ed., *General and Comparative Endocrinology Journal* Vol. 48' No.4' Dec.' 1932' p. 505.

c. Efferent fibers were/ atemused for/ refered to the fibers which (that) carry/ carrying impulses to the central nervous ststem. (active past).

d. The fibers which (that) carry/ carring impulses to the central nervous system wererecalled/ were known as/ were named/ were termed efferent fibers. (passive past)

e. Niacin deprivation causes/ leads to/ produces pella-gra. (linking effect with cause-active present)

f. Pellagra is caused by/ is produced by/ niacin depriva-tion. (linking cause with effect-passive present).

g. Niacin deprivation caused by/ led to/ produced pellagra. (active past).

h. Pellagra was caused by/ was produced by/ niacin dep-ri-vation (10) (passive past).

From the above mentioned examples different semantic-implications arise when the same D or CE is onced expressed through the simple present and another by the past form.

This distinction is a crucial one in any form of EST teach-ing as is also significant in scientific writings. It seems that the choice of simple present rather than the past mainly depends on how many instances of a case or process a scientist usually makes. If the scientist has a knowledge of a large number of cases the will use the present. Thus, the present is reserved for the expression of those Ds and CEs which are concerned with permanently established and universally accepted scien-tific laws. Ds and CEs thus expressed are most comm only to be found in academic levels of scientific writings' i.e. text-book

(10) It is worth stating that other constructions apart from simple tense and modals can be used to express CE. Some of these are: prepositional phrases expressinsg cause such as adjectival "due"; adverbial "as a result of"; conjun-ctions specifying cause' "since". etc.

This significant result justifies a shift from the usage to the use value of the grammatical items. The students are no longer in need of further formal knowledge of grammar in isolation. At the tertiary level they need the language for different purposes: to define, to illustrate to reason and arrive at conclusions; all an inseparable part of scientific discourse.

3. Introducing the communicative functions of Tenses and Modals:

On the basis of the above discussion an attempt to develop the students reasonable working knowledge of the grammatical system toward meeting the fundamental communicative needs and specialization appears a justifiable one. A knowledge of the communicative role which the simple tense and modals play in EST may be of paramount importance at this stage for EST instructors and students(9).

3.1. The simple tense

The simple tense, whether present or past, active or passive is commonly used to express D and CE in EST. D and CE may take the following forms :

a. Efferent fibers are/ia a term used for/refer to the fibers carrying/which (that) carry impulses to the central nervous system. (nominal D-active present).

b. The fibers which(that, carry / carrying impulses from the central nervous system are called/ are known as/ are named / are termed efferent fibers. (real D-passive present).

(9) It should be noted that communicative functions have been introduced in Book VIII of *The New English Course for Iraq*, designed for secondary schools, but these functions are socially-oriented and differ a great deal from those required by the tertiary level students of sciences.

		1	2	3	4
Tense	C.	23	24	22	20
	Inc.	02	01	03	05
Modals	C.	21	23	20	21
	Inc.	04	02	05	40

Table I: Results of the Structural test (8)

		1	2	3	4
Tebnse	C.	03	06	03	01
	Inc.	22	19	22	24
Tdals	C.	00	02	02	00
	Inc.	25	23	23	25

Table II: Results of the Functional test

A close examination of the students performance in both types of test, as indicated in the above tables will show that the students have an acceptable level of the grammatical system of tenses to past, active to passive and fill in the blanks with the correct verb forms. But their knowlege on how the simple tense and modals could be used to realise scientific functions seems to be negligible.

- (8) The letters "C" and "Inc." stand for correct and incorrect responses respectively. The figures 1-4 stand for the number of sentences in each test.

This paper tries to fill in this gap by presenting the communicative sides of simple tense and modals in connection with two major functions, namely definition (D) and cause and effect (CE). These functions have been chosen because of their high frequency among others in every textbook level writings of EST (5). The tenses selected for this study have also been found to be among the most frequent ones in EST (6).

2. Procedure used:

Two set of tests were administered to 25 freshers from the Biology Department at the University of Mosul. The first test was primarily designed to measure the students level as far as their knowledge of the "usage" value of tenses and modals was concerned. The second was designed with the aim of finding out the students standard with regard to the "use" value of the same grammatical items. In the first test the students were asked to provide the correct verb forms and change sentences from one tense to another. The second test emphasized the realisation of these tenses and modals in EST. Students were given questions on functions which these grammatical items assume in the language of science. The following tables summarize the results of both tests(7).

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- (4) Although the "Focus Series of OUP and the "Nucleus Series" of Longman are functionally based textbooks, the functional aspects of tenses and modals are rarely tackled
 - (5) For more details see Widdowson, *Explorations in Applied Linguistics*, OUP, 1979, p. 13.
 - (6) This is based on the findings of research work done at Mosul University, Department of European Languages, where an ESP graduate programme was conducted and lasted for five years. See for example, Mahmoud Hazim, *Tense and Aspect in EST*, 1981 (Un published M.A. theses)
 - (7) For the items of each test see appendices I and II.