

## Identification of Arguments and Argumentative Connectors

Corina Yoris-Villasana  
 Universidad Católica Andrés Bello  
 Caracas, Venezuela  
[cyoris@ucab.edu.ve](mailto:cyoris@ucab.edu.ve)  
[cyoris@gmail.com](mailto:cyoris@gmail.com)

### Abstract

An instructional strategy is presented in order to help the students enrolled in courses of *Introduction to Logic* to differentiate the constituent parts of an argument through the use of argumentative connectors. When developing the strategy, it is important, in the first place, to make visible the text structure that is being analyzed, and in the second place, to make clear the meaning of this text. Although it is true that “the idea of centering on the connectors to interpret an argument is far away from being new” to apply the strategy allows to reveal the different beliefs of the student as well as to provide the teacher with tools to understand them. Also, if what we pursue is that the student learns to reason critically, when achieving that, he or she develops the competencies to reflect and understand abstract concepts. We prepare them to learn that the development of those competencies will help them in the field of their specialty.

Descriptors: Argumentative connectors, didactics, logic, argument

### Introduction

In an introductory course to Logic, the main difficulty for the teacher, and thus, for the students, is the identification of arguments. For the teacher, it is to explain what they mean, for the students, it is to identify them. In the background of this problem, several aspects of philosophical nature exist and if they are put aside, they will lead to the failure of the instructional strategy that has been chosen.

In accepting that, an argument is a set of statements in which one or several of these act as a premise or premises that, as a logical inference, support another statement which is known as conclusion. Most of the times we suppose that premises are true and, second, we also suppose that premises are related to the conclusion because they support it. This inferential correspondence among premises and the conclusion is the backbone of Logic. This last supposition is the one that brings serious problems at the moment when the students identify arguments.

If the inferential links were present, why in arguments where the student knows that the premises are true, they are not able to identify the conclusion as a necessary step? In this respect there is an article of Axel Barceló (2003) that should be considered if there is a need to clarify the scope of Logic, which goes beyond the scope of this paper.

If we begin with a strategy that supposes the need of an inference, it is most likely that we find the obstacle indicated *supra*: the student does not find the link. Here a very meaningful aspect emerges and it is that an argument is something more than a set of statements known as premises and conclusion. The argument has as a constituent element the inferential link, and to distinguish this element is precisely the difficulty for the student that approaches Logic for the first time.

This paper will try to develop an instructional strategy that relates the use of the argumentative connectors with the identification of the premises and the conclusion and, in this manner, to establish the present inferential link in a clear way. When developing the strategy, it is important, in the first place, to make visible the text structure that is being analyzed, and in the second place, to make clear the meaning of this text.

I am going to use the term "argumentative connector" with the meaning of an expression (or simply a word) that serves to relate the different components of an argument. In this way, a simple classification of these connectors can be made taking into account their function, whether causal, adverse or others. Also, it should be considered that the person who speaks, writes or explains is doing an "argumentative action" where he or she pretends, among other things, to prove, to reason, to explain, to persuade, to give an opinion, or to suppose something.

In general, the student that approaches the introductory courses of Logic does not establish a distinction between a justification and a cause. When a person is justifying something, this justification depends on the development of the argumentation, while to express the cause of something is to show a relation between facts. In the same manner, one deduction or one conclusion is not a consequence, since to elaborate one deduction or one conclusion depends on the development of the argumentation. On the other hand, to formulate a consequence involves to reveal a relation between facts (Cfr. Lindenlauf, N. 1990).

Taking into account the distinctions that Lindenlauf uses to improve the comprehensive reading, we will classify some of the connectors whose function is that of relating the statements in one argumentation. I wish to make clear that this list is not definitive. I only pretend to show those connectors that our students use more frequently in their daily language.

The statements that follow a connector of

*Cause.* They explain or justify what was said before: because, so, for this motive, given that, since, so that, among others.

*Conclusion.* They are an effect of what was said before: that is why, that is, as a consequence, thus, therefore, in effect, etc.

*Condition.* They are conditions that will have consequences: if..., so that, unless, meanwhile, if it is not, in the case of, when, according to, always, etc.

*Certainty.* It is stated that what has been said is true: without doubt, it is evident, in fact, it is sure that, it is notorious, it is undeniable, it is clear, etc.

*Opposition.* They establish something different to what has been said before: but, although, though, even though, however, not ..... but, in spite of, etc.

*Equality.* They do not establish anything different, they only explain: that is to say, in other words, in the same manner, equally, that is to mean, in summary, etc.

*Comparison.* They have some similarity or difference with the previous ones: it is similar, such as, as.....as, if is different from, more or less, etc.

The obstacle that we wish to overcome with the students is focused, in the first place, to achieve a cognitive level, that is to say, the students should be able to make relations between the parts of a text, to recognize the main and the secondary points and differentiate them, and to be able to think of examples and to apply them (Cfr. Vermunt, 1996). In other words, to do activities that are part of the cognitive process. Once this first stage is achieved, we go on to the next level which is the metacognitive level. This process involves two meaningful stages, evaluation and regulation (Cfr. Baker, 1994). Evaluation refers to whether the text has been understood or not; while regulation refers to know how to solve the problems that have been encountered.

The students are in the first year of their careers, so the cognitive level is supposed to be achieved. That is the mistake. In the case of our students, the comprehensive reading is not their strong point. That is why I show some examples of statements related to their context and I use a clear language. The connectors that are less difficult for the students are the conjunction and its possible variants. I begin with these connectors and continue changing these, but not the statements. After each example, I administer a very brief questionnaire that gives me information about the degree of comprehension of the relations between the statements. Once these relations are understood, I add one connector of conclusion. I increase the difficulty of the text, and I continue with connectors of conclusion and I administer the questionnaires to make sure the reference text has been understood.

I used this strategy in the Faculty of Law, students of the first year of the career, without any previous preparation in logic. The same examples of arguments I used in a class of 15 students, in the first year of the career in Philosophy without any previous preparation in logic, but I did not introduce the strategy, and I went directly to use examples with arguments and without explanations about the connectors; I proceeded in a similar way with a group of students from Literature, 27 students of the first two years of the career. The Law students in a single session learned the relationship between premise and conclusion, proving that at least in this group, the strategy gave an optimum result, while not using it forced me to repeat the class with the students of philosophy and recommend to the Professor of Literature to use, at least once, the strategy applied in law.

#### Implementation of the strategy

Following Anscombe & Ducrot (1994), who employ the notion of argumentative instructions, I illustrated an everyday situation using the connector "but", and the connector "although" in another example.

If we have the following composite statement:

- A. There are riots (P), but I will go to the University (Q)

There are two statements

1. There are riots (P)
2. I will go to the University (Q)

and the connector "but".

"But" has an "argumentative instruction" which states the following: "P does not exclude Q". It is an instruction in context of a discursive situation. The student should be able to establish the relationship between both statements and the role of the connector.

I considered a second example.

- B. Although it is raining cats and dogs (P), I will go to your house this afternoon (Q).

We have two statements

1. It is raining cats and dogs (P)
2. I will go to your house this afternoon (Q)

And a connector "although" that shows opposition, it is adverse. It is easy for the student to see a statement linked to another statement through that connector. It shows us that the action of going to the house this afternoon in spite of the rain will be done.

Once they are confronted with these two examples or some others of the same kind, the teacher should proceed to verify that the student has understood and has achieved the objective that I established for this initial stage. So I administer a brief questionnaire immediately before continuing with other examples that involve new connectors.

Questions	What did we want to know?	Evaluation
In the first example, the described situations in the statements both happens or are they exclusive?	We want to know if the student has understood the information in the text and the relation between the statements	We evaluate if the student can recognize the connecting relation of both statements given by the used connector. The answer that shows the non exclusion of one statement by another is considered to be right
In relation to the second example, are the statements exclusive or, on the contrary, are they inclusive?	We want to know if the student has understood the information in the text and the relation between the statements	We evaluate if the student can recognize the connecting relation of both statements given by the used connector. The answer that indicates the non exclusion of an statement for another is considered to be right
Which difficulties has the student encountered to establish the relation?	We want to know the difficulties that the students encounter in these two first examples	The answer about the obstacles provides us with the number of how many students have had difficulties in establishing the link in both examples

In the case of students of Law, when applying the first part of the strategy, there were 48 students. This is the result.

Detected Difficulties	N° of students and percentages
The student establishes the relation	40 (83,33%)
The student misunderstands the relation with one contradiction	5 (10,41 %)
The student cannot understand what is being looked for	3 (6,25 %)

Once the questions are answered, and having detected that the number of students that did not recognize the relation of not being exclusive between the statements is low, I explained again both examples and continued with another one in which I introduced a new obstacle. Instead of using “although” between both statements, I used “unless” and I added a negation to one of the statements.

Having the same statements, we deny one and add a connector, not one of opposition, but one of condition, and in this way we are in the presence of a different sense. The “argumentative instruction” indicated by “Unless not” establishes that “Q will occur only in the case that no P occurs”.

This example was not understood completely by the same percentage that did understand the previous examples. It was necessary to emphasize that the phrase “unless not” establishes a necessary conclusion (P) so that Q occurs.

Detected Difficulties	N° of students and percentages
The student establishes the relation	25 (52,08%)
The student does not understand the presence of a negation	15 (31,25%)
The student cannot understand what is being looked for	8 (16,66 %)

Up to now I have only connected statements, I have not talked about arguments. I continue to use a connector of conclusion and I keep using the same statements with little modifications.

A. It is raining cats and dogs (P), for this reason, I will not go to your house this afternoon (Q).

With this example, the students can see more easily that the rain will prevent me from going to your house and the connector “for this reason” has the “argumentative instruction” that indicates that this last statement is supported by the other one.

Again I administered a questionnaire and this is the result.

Questions	What do we want to know?	Evaluation
In the example is there a statement that is supported by the other statement? YES NO If the answer is affirmative, # indicates which statement supports which	We want to know if the student has understood the relation between the statements	We evaluate if the student can recognize how the argument is developed. The answer that indicates the premise and the conclusion is considered to be right
Which difficulties has the student encountered to establish the relation?	We want to know which are the obstacles that the students encounter in this example	The answer about the obstacles provides us with the number of students that have had difficulty in establishing the link in the example

In this example, the percentage of students that establish the relation between statement-premise and statement-conclusion is very close to the percentage of students that understood the different previous relations with the use of other connectors of conclusion.

Detected Difficulties	N° of students and percentages
The student establishes the relation	32 (66,66%)
The presence of a negation confuses the student	12 (25,00%)
The student cannot understand what is being looked for	4 (8,33 %)

C. Nowadays, in Venezuela we confront a very serious crisis (P). This crisis touches all aspects of our lives (Q). In other words, it is an economic crisis, a social crisis, an ecological crisis, even, a cultural crisis (R).

We have three statements

1. Nowadays, in Venezuela we confront a very serious crisis (P)
2. This crisis affects all aspects of our lives (Q)
3. In other words, it is an economic crisis, a social crisis, an ecological crisis, even, a cultural crisis (R)

The connector is the phrase “in other words”, that expresses equality. The students can see with relative ease that this phrase has an “argumentative instruction” which explains that we are saying the same but in other terms.

The questionnaire administered gave us the following results:

Detected Difficulties	N° of students and percentages
The student establishes the relation	45 (93,75%)
The student cannot understand what is being looked for	3 (6,25 %)

With the same previous strategy, I changed the connector and left the same statements.

D. In Venezuela we live a very serious crisis (P), it is economical, social, ecological (Q), therefore, this crisis affects all the aspects of our lives (R).

The phrase “therefore” has an “argumentative instruction” that clearly indicates the relation between the statements that refer to the crisis, and from saying that this is economical, social and ecological, it can be concluded that that crisis affects all of our lives.

The questionnaire administered, gave us the following results.

Detected Difficulties	N° of students and percentages
The student establishes the relation	43 (89,58%)
The student cannot understand what is being looked for	5 (10,41 %)

In order to know to what extent the strategy was effective, I did not use it with the students of Literature, 27 students, to compare results and I chose the following example:

E. "La Fiesta del Chivo" is a realistic piece of work, more than a historic novel or a history become novel. [Since] in it there is a deep questioning around the power, about the limits to which a man with a great force can reach and a society that permitted him to do so.

Statements:

- "La Fiesta del Chivo" is a realistic piece of work, more than a historic novel or history become novel (P).
- In it there is a deep questioning around the power, about the limits to which a man with a great force can reach and a society that permitted him to do so (Q).

Connector:

- Since

In stating that the novel is realistic more than historic or a history become novel (P), it can be seen with relative transparency that the following statement is the “reason” with which the first statement is being supported (Q); and the phrase “since” marks the link.

When applying the questionnaire to know what was understood and which the difficulties were, this was the result:

Questions	What do we want to know	Evaluation
In the example is there a statement that is supported by the other statement? YES NO If the answer if affirmative, # indicates which statement supports which	We want to know if the student understands the relation between the statements	We evaluate if the student indicates that the relation expresses how the argumentation is developed. The answer that shows the premise and the conclusion is considered to be right.
Which difficulties have the students encountered to establish the relation?	We want to know which are the obstacles that the students encounter in the example	The answer about the obstacles provides us the number of students that have had difficulty in establishing the link in the example.

Detected Difficulties	N° of students and percentages
The student establishes the relation	7 (25,92%)

The student does not understand the text	11(40,74%)
The statement P is a complex statement and the student does not understand it	5 (18,51%)
The student does not know what the example means	4 (14,81%)

Only 25% of the students could see the relation between both statements and understand the role that the connector has. 75% of the students either did not understand the text due to certain difficulties of reading comprehension or because they could not see to what point they should arrive with the exercise. The statement (P) is a complex statement that can be analyzed separately, but for the purposes of the example, it is taken as an only one.

With respect to the students of the School of Philosophy, a total of 15 students, I did not use the strategy and used the following example:

F. If the world and the generation always existed (P), infinite men have preceded us (Q). But the soul of the man is immortal (R) . Therefore, infinite human souls would exist really (S) (Aquinas, 1, 46).

Statements:

1. The world and the generation always existed
2. Infinite men have preceded us
3. The soul of man is immortal
4. Infinite human souls would exist really.

Connectors:

1. If... (then)
2. But
3. Therefore

The “if” (conditional) has a matched "then" that in this case is implicit. There a strong obstacle was presented, since, in a first moment the second statement (Q) as a conclusion was derived from the statement (P).

When the obstacle was overcome, after several difficulties, the students could establish that statement (P) would be the statement conditioned by the first. In relation to the connector “but”, connector of opposition (generally), the students understood that the “argumentative instruction” indicates that it is being used to say something different from the precedent lines. Once these two first connections were understood, some students could understand the link that established the phrase “therefore”.

When administering the questionnaire to know what was understood and which the difficulties were, these were the results:

Questions	What we want to know	Evaluation
In the example is there a statement that is supported by the other statement? YES NO If the answer is affirmative, indicate which statement supports which	We want to know if the student has understood the relation between the statements	We evaluate if the student can express that the relation shows how the argumentation is developed. The answer that shows the premise and the conclusion is considered to be right
Which difficulties have the students encountered to establish the relation?	We want to know which are the obstacles that the students encounter in the example	The answer about the obstacles provides us the number of students that have had difficulty in establishing the link in the example.

Detected Difficulties	N° of students and percentages
The student establishes the relation of conclusion	3 (20%)
The student cannot understand the text	7(46,66%)
The student does not understand what is the meaning of the exercise	5(33,33%)

The result was worse than with the students of Literature. Certainly it is an example that is more complex to be understood, but I chose one text related to Philosophy and at the moment of administering the questionnaire, they were studying Medieval Philosophy where they read Aquinas.

This example, of the ones used up to now, is the one that had the most difficulty in its explanation. Once the students understand this, it is easier for me to use it to expand the concept of argument.

To explain that in a specific text there can be more than an argument, it is even more difficult. To enter the topic of the reconstruction of arguments, where there is more than one conclusion, requires that this first phase is understood completely.

In the case of the students of Philosophy, once the students have identified the premises and the conclusion of the previous example, I take it again and I add to it three statements more as it appears in *Summa Theologiae*:

If the world and the generation always existed, infinite men have preceded us. But the soul of the man is immortal. Therefore, infinite human souls would exist really. This is impossible. That is why, it can be proved that the World has begun at a certain moment and, therefore, it is not only a matter of faith (Aquinas, 1, 46).

Once the objective is fulfilled, that is the identification of the arguments, then we can try to explain the enthymemes, and the validity, concept that, without the previous assimilation of the notion of argument is impossible to be understood completely.

### **Results and analysis**

When comparing the results of the three groups it can be observed that in the case of the students of Law, to whom the examples were explained step by step with changes in the connectors to arrive at the connector of conclusions or premises, the level of comprehension was high. In the case of the students of Philosophy, to whom the strategy was not applied, I had to explain the example several times, without obtaining an excellent result. The same happened with the students of Literature whose results were not satisfactory.

It is clear that the students have problems in Reading comprehension and this fact makes more complex the teaching of Logic and of Argumentation. The use of a simple language and of meaningful examples helps to overcome certain obstacles. I made up very simple examples for the students of Law and they did not have problems with the comprehension of the text. With the two other groups I chose examples from the textbooks of each specialty, literature and philosophy, and I found problems with reading comprehension of the text.

I intend to administer a new questionnaire at the end of the course in order to compare the results of the “input” and of the “output”; as well as to present the results and discuss them with the teachers of Logic in the first courses in the university where I teach.

### **Conclusion**

The results indicate that

1. There is a problem with the reading comprehension of texts. This difficulty seems not to belong to the specific course of Introduction to Logic. However, it is necessary to attend to it teaching the students some cognitive and metacognitive strategies. This means that the student learns to self-regulate and to apply acquired knowledge so that their level of reading comprehension increases.
2. The selection of made up examples with simple language and related to their daily life motivates the students.
3. Although the idea of centering on the connectors to interpret an argument is far from being new to apply the strategy previously described allows to reveal the different deficiencies the students have and gives the teacher tools to overcome them.
4. Also, if what we pursue is that the student learns to think critically, when they develop the competencies to reflect and understand abstract concepts, we also prepare them to understand that the development of those competencies will help them much more in the field of their specialty (Cfr. Campirán, A., 1999).

Once the objective has been achieved, which is the identification of the arguments, it can be possible to try to explain the enthymemes and the validity. This concept without previous assimilation of the notion of argument is impossible to be completely understood.

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