

(especially those that serve interests) becomes, we can argue, very problematic.

We have mentioned in earlier sections the effect a unit on egocentrism can have on students' dismissal of critical thinking as sophistic, how an emphasis on the need to engage in reciprocity when analyzing arguments helps answer the charge.

Paul has long believed in the importance of understanding, analyzing, and evaluating arguments in light of the argument networks of which they form a part. We've discussed the difficulty in taking arguments from very different world views seriously. We tend to dismiss such arguments as obviously absurd unless we can become aware of and critique our own world view. **Students should be encouraged to entertain very different world views, imagine how a person or group with different interests, and history might see things, and incorporate their strengths, and so improve the world view so crucial to their analysis.** Victims of U.S. sociocentric conditioning can learn a lot from seriously entertaining a Third World world view, to reduce the biases in favor of the U.S. and increase their sensitivity to the rights and needs of a greater number of people. The more fair and realistic the student's world view becomes, (the less egocentric and sociocentric) the less sophistic and self-serving, and hence the more accurate, their evaluations of reasoning will be.

## NOTES

<sup>1</sup>Richard Paul, "Teaching Critical Thinking in the 'Strong Sense': A Focus on Self-Deception, Work Views, and a Dialectical Mode of Analysis". **Informal Logic Newsletter**, vol. iv, no. 2(May, 1982), pp. 2-7.

<sup>2</sup>Howard Kahane, **Logic and Contemporary Rhetoric**, (Belmont, California: Wadsworth Publishing Company, Inc. 1980), p.14.

<sup>3</sup>Jean Piaget, **Six Psychological Studies**, David Elkind, Vintage Books Edition, New York, (Vintage Books/A Division of Random House, September 1968), pp.13-14.

<sup>4</sup>Sarah F. Campbell, ed., **Piaget Sampler**, New York, London, Sydney, Toronto, (John Wiley & Sons, Inc., 1976), pp. 38-39.

<sup>5</sup>Jean Piaget, **Judgement and Reasoning in the Child**, C.K. Ogden, Totowa, New Jersey, (Littlefield, Adams & Co., 1976), p. 220.

<sup>6</sup>*Ibid.*, p. 228.

<sup>7</sup>*Ibid.*, p. 130.

<sup>8</sup>Sarah F. Campbell, ed., **Piaget Sampler**, New York, London, Sydney, Toronto, (John Wiley & Sons, Inc., 1976), pp. 51-54.

<sup>9</sup>Howard Kahane, **Logic and Contemporary Rhetoric**, (Belmont, California: Wadsworth Publishing Company, Inc. 1980), p. 141.

<sup>10</sup> Jean Piaget, **Six Psychological Studies**, David Alking, Vintage Books Edition, New York, (Vintage Books/A Division of Random House, September 1968), p. 20.

<sup>11</sup> Jean Piaget, **Judgement and Reasoning in the Child**, C.K. Ogden, Totowa, New Jersey, (Littlefield, Adams & Co., 1976), p. 138.

<sup>12</sup>*Ibid.*, p. 11, 244.

<sup>13</sup>*Ibid.*, p. 244. ●

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# Towards a Structural Analysis of Extended Arguments

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One of the values of teaching practical logic is showing students how to portray the logical structure of an argument. A structural diagram visually depicts the logical relationships between all sentences of the argument. Not only does the diagram show the lines of reasoning between premises and a conclusion, but also the relationship between one premise and another premise, showing for example whether two premises are dependent or independent of another in supporting a given conclusion. This latter function of presenting the relationship between premises is particularly valuable for teaching how to analyze lengthy arguments. Students can conceptualize the variety of ways in which reasons can relate to each other within a lengthy argument, not as easily accomplished by traditional logic techniques.

A structural portrayal becomes indispensable in analyzing extended arguments, which are far more prevalent in natural language than the three-sentence arguments appearing in traditional logic texts. Recently many practical logic texts have in fact suggested a method for portraying the logical structure of extended arguments. This method, which I call the standard method for structural-analysis of an argument, recommends that the logical structure of an extended argument be presented by carefully combining the structures of all sub-arguments. This atomistic process of building the entire structure of the extended argument

by combining all sub-arguments is, however, extremely impractical for pedagogical purposes when the arguments are lengthy and complex. For such arguments we need a method for carefully selecting a smaller structural segment of the entire argument, a model which provides considerable flexibility in choosing a portion of the entire structure to meet the particular purposes of the classroom. Such a method is not included in the standard model for structural analysis, primarily because advocates of this method in practical logic texts tend to overemphasize the importance of a complete structural portrayal.

The primary purpose of this paper is to introduce practical methods for depicting the structure of an extended argument. The inadequacies of the standard method will be examined in Section I, after which two methods for selecting portions of the entire argument are introduced presented in Section II. Structural analysis of a particular newspaper editorial will be used throughout this paper.

## I

As first presented by Monroe Beardsley in **Practical Logic**,<sup>1</sup> the standard model for structural analysis has been articulated in many practical logic texts.<sup>2</sup> An abbreviated version of this model even appears in the 6th edition of Irving Copi's **Introduction to Logic**.<sup>3</sup> One relatively full account of this model, and the account on which I will base my summary of this model, appears in Stephen Thomas's **Practical Reasoning in Natural Language**.<sup>4</sup>

According to Thomas, the first step in a structural analysis is to number consecutively every meaningful sentence in the discourse under study. For this step the class is given some shared rules for numbering each sentence of the argument, so that ideally anyone can refer to a sentence through its assigned number. Each grammatically simple declarative sentence receives a separate number, and two independent sentences within a compound sentence will also receive separate numbers. Complex

## Diagram 1



sentences are more troublesome however, for it is difficult to determine whether the entire complex sentence should receive a single number, or a number be assigned to each of its two clauses. Thomas's own answer to this is suggestive,<sup>5</sup> although a full account of his remarks would surpass the scope of this paper. My own classroom experience showed that an application of Thomas's guidelines for assigning numbers is somewhat indeterminate but certainly workable for many extended arguments. This problem of assigning numbers to sentences requires much more clarification than has been given to date, as Thomas would probably agree.

Once everyone in the class agrees to an assignment of numbers to sentences, Thomas's second step requires that the logical relationship between sentences be represented by use of an arrow, indicating the transfer of belief from one sentence to another. For example: means that sentence 2 is the reason for 1. According to Thomas, a structural analysis of all extended arguments

requires the tedious work of presenting and combining every logical connection between sentences of the entire discourse under study.<sup>6</sup> For particularly long and complex arguments he recommends this be done in stages, first from the final conclusion(s) working backwards to the immediately supporting reasons, and second from the basic reasons working down to the intermediate conclusions. With this step-by-step method, "up from the bottom and down from the top," the complete extended argument can be structurally analyzed.

But like other proponents of the standard model, Thomas overemphasizes the importance of a structural depiction of the entire extended argument. Clearly, a complete structural analysis of many extended arguments, such as position papers and book chapters, would be almost impossible even for the most diligent student of logic, and far more confusing than illuminating. When instructors are trying to show the importance and plausibility of a structural analysis for extended arguments, it is essential to acknowledge that extended arguments raise problems and suggest resolutions which are significantly different from those of smaller arguments. To render a structural analysis realistic, students should be provided with a method of selecting a partial structural analysis, to decide in advance exactly what dimension of the argument's structure should be portrayed. An adequate model for structural analysis should therefore emphasize, and encourage, students to carefully select for analysis certain structural segments which best meet the particular exercise in question.

My own teaching experience has repeatedly shown the need for a selective method of structural analysis. Consider the following extended argument, which was an editorial on the "op-ed" page of **The Washington Post**.<sup>7</sup> Although somewhat cumbersome for the present paper, this editorial is representative in length and complexity of many newspaper editorials. Each structurally independent sentence will be numbered and enclosed in parentheses. Some vague expressions will be formulated and enclosed in brackets.

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### Reagan Never Meant What He Said

by Ed Crane

1 (Amid the wringing of hands and gnashing of teeth in Republican circles these days, and the breathless anticipation of November by the Democrats, an important fact is being ignored.) 2 (Reaganomics has not failed.) 3 (Reaganomics is simply a fiction.)...

4 (And that's show biz.) 5 (If Steven Spielberg can make adults teary-eyed at the sight of flying bicycles, then Ronald Reagan can make otherwise intelligent people believe he is going to reduce the size of government.) 6 (Americans are suckers for a good story) and 7 (very few people can spin a tale the way this former actor-turned-president can.) 8 (This is not a frivolous point.) 9 (Early in his political career Ronald Reagan discovered that he had a unique talent for reaching people.) 10 (He can project sincerity, honesty and integrity), [and] 11 (these traits, when combined with an anti-government message, strike a remarkably responsive chord with the voters.)

12 (The problem is that Reagan the politician uses ideology as a vehicle for returning to center stage.) 13 (He

does not ... use his acting ability to advance a deeply imbued ideology.) 14([This is where most observers go wrong.]

15(That the myth of Ronald Reagan the ideologue persists is a tribute to his speech-making ability.) 16(He's latched on to a script that clearly plays in Peoria.) 17(The rub is, he doesn't **mean** it.)

18(Ronald Reagan is actually quite like most politicians.) 19(He seeks elective office for the reason other men climb mountains: because it is there.) 20(When you hear him give a speech on the stump, it may be hard to believe that he really isn't committed to what he is saying, but 21(the plain truth is that he isn't.)

22(This is not the most ideological administration in generations, as portrayed by the media.) 23(On the contrary, this is a non-ideological administration.) 24(The mass exodus of those even mildly ideological in the administration before midterm should be evidence enough.)

25(Ronald Reagan's record as governor of California only confirms what we're seeing today in his presidency.) 26(His stirring campaign speeches called for reducing the burden on California's taxpayers), but 27([his speeches] were matched by eight years of the most rapid growth ... of government spending and taxes in the state's history.)

And it is precisely because 28(the President is not viscerally committed to any set of political principles) that 29(his performance as President will parallel his performance as governor.) 30(When you are a chief executive of a government and you are more interested in doing a "good" job than in defining what the objectives of the job are, you surround yourself ... with "competent" and "experienced" administrative aides.) 31([This is what Reagan does.]

32(In a commercial business, this sort of policy makes sense.) 33(The federal government, however, is not a business.) 34(It is an expression of the political philosophy of the people of this nation.) 35(The Reagan campaign rhetoric that the people endorsed ... was to reduce the size and power of government.)

But 36(as Reagan's track record consistently demonstrates, the campaign rhetoric [to reduce the size and power of government] was just that-rhetoric.) So 37(we should not be surprised to find that when the experienced government professionals appointed by the president undertake their assignments, it is with bureaucratic rather than ideological goals in mind.) 38(This fact, [expressed in sentence 37] describes the nature of government today.) 39([The government's] tendency is to grow), and 40(it is the non-ideological "experts" who facilitate [the growth of government].)

Hence, 41(the explicit campaign pledge to abolish the departments of Education and Energy turns out to be nothing more than a reshuffling and renaming exercise.) 42(The rhetorical resonance of the incompatibility of liberty and draft yields to the practicality of sending the Russians a "message.") 43(Freeing the economy of excessive red tape translates into the re-regulation of transportation and more red tape.)

44(And so it goes.) 45(A commitment to free enterprise is actually a commitment to protectionism and business subsidies.) 46(Balancing the budget is a popular idea that manifests itself as the largest deficit ever.) 47(And the greatest tax cut in the history of this nation becomes the greatest tax increase in history ....)

48(And the pity is that Ronald Reagan had a genuine mandate to turn his small-government rhetoric into reality.) 49(Strong presidents don't even **need** a mandate.) 50(Lyndon Johnson, whose only "mandate" was to keep us out of the war Goldwater might get us into...turned Vietnam into a full-fledged war), [and] 51(Johnson created the massive Great Society welfare boondoggle at the behest of not much more than bureaucrats and sociologists.) 52(With Johnson's skill and, more important, **commitment**, Reagan could have rapidly and dramatically rolled back the size of government.)

53(But, of course, it's 1982.) and 54(taxes are not lower), 55(federal spending is at an all-time high), 56(government itself continues on its meddlesome way regulating everything from natural gas to marijuana use.) 57(The irony is that the media have been so captivated by the form of Ronald Reagan's performance they have completely overlooked its lack of substance.)

58(In a perhaps inadvertent moment of candor Monday night, the president told the nation that his \$100 billion tax increase "absolutely does not represent any reversal of policy or philosophy of the part of this administration, or this president.") 59([This admission expressed in sentence 58] is true, of course.) 2(Reaganomics isn't a failure.) 3(Reaganomics isn't.)

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Notice that the last two sentences are assigned numbers 2 and 3, since they convey the same meanings as sentences early in the editorial.

Any attempt by students to provide a complete structural analysis would be met by frustration and confusion, and would be counterproductive to the general goal of providing insight into the underlying logical character of the discourse. A partial selection of the structure is clearly necessary.

One possible method for selecting structural segments is simply to choose certain sentences or paragraphs from the original discourse and then to portray the structure of these passages. But this simple method will generally fail, because the written sequences of sentences or paragraphs have no direct relation to the logical structure. This problem becomes particularly acute with extended arguments where the logical relationship between a reason and its conclusion may be camouflaged by many other sentences. Frequently, extended arguments are written so poorly that the structural relationship between sentences will be extremely convoluted and immune to a simple portrayal.

Consider for example the primary reasons given in the editorial above on behalf of sentence 3, that Reaganomics is simply a fiction. Some of these reasons are scattered throughout the editorial, such as sentence 36, that Reagan's campaign promises to reduce the size and power of government was just rhetoric.

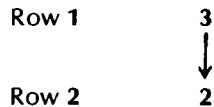
In what follows I will present two methods for selecting the structural segments of an argument, the structural row and the structural column methods.

## II

To explain the structural row method, we will begin with Thomas's suggestion that every simple declarative sentence in the discourse receives a number, and that the arrow depicts the logical relationship between a reason and its conclusion. We can now define a structural row of the complete structure as the set of numbered sentences which lie on the same horizontal level in relation to the final conclusion(s). The  $n$ th structural row, by definition, consists of all the numbered sentences which are  $n$  arrows away from the final conclusion(s). On this definition, all of the numbered sentences on a given row will be the same "distance" from the final conclusion(s), as shown by the number of arrows.

With this concept of a structural row, students can be asked to extract from the entire argument all the sentences on a particular row. Consider, for example, the value of assigning students the final conclusion and row 1 of the editorial presented above. This "lower" structural segment of the entire argument is as follows:

Diagram 2



Although sentence 3 is the primary topic of discussion, that Reaganomics as it is widely known is not being practiced by the administration, 2 is the final conclusion, since 2 follows from 3. Although this structural segment appears simple, the task of sifting through the entire extended argument and extracting the appropriate sentences is both challenging and valuable to students. For many extended arguments an analysis of the lower structural rows will reveal the most important components of the entire argument, for this partial structure would include sentences which directly support the conclusion(s). This ability to select the most important aspects of an extended argument is certainly an indispensable dimension of reasoning, and should be emphasized in a practical reasoning course.

From my own teaching experience, students found that an analysis of the lower two rows clearly introduced the general concept of a structural row, especially when each row included only one sentence, such diagram 2 above. The row method becomes considerably more challenging when students are asked to portray the structure of some "higher" row. But as I discovered, students will be unable to give a particular number to this row, since they can never know exactly the distance from the final conclusion without a complete structural analysis. Consider the row, identified as Row  $n$ , which directly supports sentence 39, that the tendency of government is to grow.

Diagram 3

Row  $n$     41   42   43   45   46   47

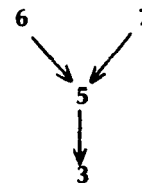
Each of these sentences directly illustrates the government's tendency toward growth, according to the writer. This shows the flexibility of the row method, for the instructor may assign any row, as determined by the

difficulty of the assignment and the abilities of the students.

In spite of this flexibility, the row method is clearly limited in the way it segments the entire structure, for any given row fails to present the chain of reasoning leading up to a particular conclusion. What is needed is another method to portray an unbroken series of reasons building on each other to form a vertical chain. This second method requires the notion of a structural column, which is the vertical counterpart to the horizontal row. A structural column is defined as a set of numbered sentences beginning with a given conclusion at the bottom of the column and working back up the chain of reasons. To identify a particular column we must first select a particular conclusion, which need not necessarily be the final conclusion, and then search for all the sentences that form an unbroken chain directly supporting the conclusion.

Consider for example all the sentences in the second paragraph above supporting 3, that Reaganomics is a fiction. The logical structure may be expressed by the following column:

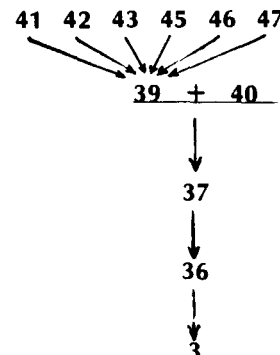
Diagram 4



Since 3 is chosen as the final conclusion of this particular column, there is no need to include the sentence below 3, which is 2. Also, notice that 5 is directly supported by two sentences, 6 and 7. This illustrates that a column may not be in single file, as it were, for many sentences are directly supported by two or more reasons.

This column method obviously becomes rather difficult to apply if the logical structure of the reasons is complex. For example, sentence 3 above is supported by another column, which is far more intricate than the column with Diagram 4. In sentences 36 through 47, the writer presumably shows that Reagan's pre-election promises were merely campaign rhetoric. These sentences constitute a rather fully developed sequence of reasons on behalf of 3.

Diagram 5



Notice that this column includes the row of sentences directly supporting 39, as depicted in Diagram 3. Also sentences 39 and 40 are linked, which means that neither

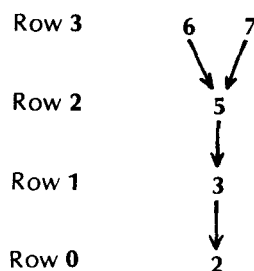
one can function as a reason for 37 without the other.<sup>8</sup> In contrast to these linked reasons, sentence 41, 42, 43, 45, 46 and 47 are all convergent reasons on behalf of 39, for each reason could function independently as a separate reason for 39.

Admittedly, the column method is somewhat indeterminate, for it is possible to give alternative renditions of the structure. For example, **Diagram 5** may not be the only plausible interpretation of the column supporting 3. This indeterminacy results from certain ambiguities with the key concepts of any structural analysis, such as the concepts of linked reasons and convergent reasons mentioned above. In spite of this problem, the column method effectively shows students exactly how a line of reasoning functions in argumentation. Students will visualize not only the nature of a line of reasoning, but also the simultaneous use of two or more lines of reasoning. More importantly, this method provides considerable flexibility to the instructor in assigning students a wide range of possible columns, a flexibility which is essential for the structural analysis of extended arguments. Instructors have the choice of selecting almost any sentence in an argument as the conclusion, since the column's conclusion need not be the final conclusion of the argument. Also, after this selection, instructors must decide on the particular line of reasoning if the selected conclusion is supported by more than one chain of reasons. Like the row method, the column method offers a practical alternative to the atomistic method of Thomas.

In spite of this flexibility of the two methods, a problem arises with the application of the row method. Unlike many rows which contain only a single sentence, some rows include sentences which will each support different conclusions in a lower row. As can be determined by **Diagrams 4** and **5**, sentences 5 and 36 both support 3 but from completely different lines of reasoning. Thus, the instructor's assignment of row 2 would not allow for a more specific portrayal of a part of the row. We need a more selective means of segmenting the structure to permit an analysis of some portion of the row.

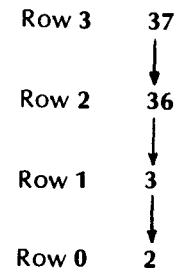
This problem can be solved by combining the two structural methods in the following way. As stated above, the row method calls for finding all sentences on a horizontal level, and similarly, the column method requires the presentation of all reasons above a particular conclusion. But a combined row-column method could allow for a more precise selection of a portion of a row within a particular column. Instead of assigning an entire row or an entire column for analysis, we may now assign that part of a row falling within some selected column. Row 2 from **Diagram 4** includes only sentence 5, whereas row 2 from **Diagram 5** includes sentence 36. The instructor can assign rows 0 through 3, but only for the column represented by **Diagram 4**. This would be captured by the following diagram:

**Diagram 6**



Alternatively, the instructor may assign rows 0 through 3 for a different column, represented by **Diagram 5**.

**Diagram 7**



These two structures depict the portion of rows 0 through 3 falling within the selected column. This combination row-column method constitutes a third method for instructors to implement, and offers the most flexibility in assigning a particular portion of the overall structure.

Because of the considerable flexibility which these methods give, the successful application rests on the instructor's sensitivity to the students' abilities to determine the appropriate segment of the overall structure to assign. I found that very short and simple assignments are necessary to introduce the concepts of a row and a column. From my experience, students easily conceptualized the purpose of these methods, allowing for more challenging assignments. I then assigned rather difficult structural segments, anticipating that many students would discover the correct analysis only after class discussion. This enabled students to improve their own reasoning skills by visualizing the variety of ways sentences can logically relate to one another.

In this paper I have tried to dispel the impression left by many practical reasoning texts that the goals of analyzing both extended arguments and non-extended arguments are the same, particular concerning a complete structural analysis. Once we acknowledge the impracticality of such an analysis for extended arguments, and the failure of the atomistic methodology to combine every logical connection, we begin to understand the uniqueness of a theory of extended arguments. In particular, such a theory should include flexible methods for extracting structural segments of the extended argument.

### Notes

1. Monroe Beardsley, **Practical Logic** (Englewood Cliffs, N.J.: Prentice-Hall, 1950).
2. Gerald Nosich, **Reasons and Arguments** (Belmont, California: Wadsworth Pub. Co., 1982). Gerald Runkle, **Good Thinking: An Introduction to Logic**, 2nd edition (New York: Holt, Rinehart and Winston, 1981). Michael Scriven, **Reasoning** (New York: McGraw-Hill, 1976).
3. Irving Copi, **Introduction to Logic**, 6th edition (New York: Macmillan, 1982.)
4. Stephen Thomas, **Practical Reasoning in Natural Language**, 2nd edition (Englewood Cliffs, N.J.: Prentice-Hall, 1981), Chapter 1.
5. *Ibid.*, pp. 73-81.
6. *Ibid.*, pp. 295-323.
7. Ed Crane, "Reagan Never Meant What He Said," **The Washington Post**, August 19, 1982, p. A19.
8. Thomas, **Practical Reasoning**, *op.cit.*, Chapter 1. ●

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