

12-14-2016

Economic Reasoning and Fallacy of Composition: Pursuing a Woods-Walton Thesis

Maurice A. Finocchiaro

University of Nevada, Las Vegas, maurice.finocchiaro@unlv.edu

Follow this and additional works at: https://digitalscholarship.unlv.edu/philosophy_fac_articles



Part of the [Philosophy Commons](#)

Repository Citation

Finocchiaro, M. A. (2016). Economic Reasoning and Fallacy of Composition: Pursuing a Woods-Walton Thesis. *Proceedings of the 11th International Conference of the Ontario Society for the Study of Argumentation (OSSA), 2016 1-7*. OSSA Conference Archive.

https://digitalscholarship.unlv.edu/philosophy_fac_articles/30

This Conference Proceeding is protected by copyright and/or related rights. It has been brought to you by Digital Scholarship@UNLV with permission from the rights-holder(s). You are free to use this Conference Proceeding in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/or on the work itself.

This Conference Proceeding has been accepted for inclusion in Philosophy Faculty Publications by an authorized administrator of Digital Scholarship@UNLV. For more information, please contact digitalscholarship@unlv.edu.

May 18th, 9:00 AM - May 21st, 5:00 PM

Economic Reasoning and Fallacy of Composition: Pursuing a Woods-Walton Thesis

Maurice A. Finocchiaro

University of Nevada, Las Vegas, Department of Philosophy

Follow this and additional works at: <https://scholar.uwindsor.ca/ossaarchive>



Part of the [Philosophy Commons](#)

Finocchiaro, Maurice A., "Economic Reasoning and Fallacy of Composition: Pursuing a Woods-Walton Thesis" (2016). OSSA Conference Archive. 89.

<https://scholar.uwindsor.ca/ossaarchive/OSSA11/papersandcommentaries/89>

This Paper is brought to you for free and open access by the Department of Philosophy at Scholarship at UWindsor. It has been accepted for inclusion in OSSA Conference Archive by an authorized conference organizer of Scholarship at UWindsor. For more information, please contact scholarship@uwindsor.ca.

Economic Reasoning and Fallacy of Composition: Pursuing a Woods-Walton Thesis

MAURICE A. FINOCCHIARO

Department of Philosophy
University of Nevada, Las Vegas
Las Vegas, NV 89154-5028
USA

Email: maurice.finocchiaro@unlv.edu

Abstract: Woods and Walton deserve credit for including (in all editions of their textbook *Argument*) a discussion of “economic reasoning” and its susceptibility to the “fallacy of composition.” Unfortunately, they did not sufficiently pursue the topic, and argumentation scholars have apparently ignored their pioneering effort. Yet, obviously, economic argumentation is extremely important, and economists constantly harp on this fallacy. This paper calls attention to this problem, elaborating my own approach, which is empirical, historical, and meta-argumentational.

Keywords: argument of composition, composition, Douglas Walton, economic reasoning, economics, fallacy of composition, John Woods, meta-argumentation

1. Introduction

Let us begin by summarizing some terminological clarifications and stipulations, which I have found useful when researching the present topic (cf. Finocchiaro, 2013a; 2013b; 2015a; 2015b). Economic reasoning refers to argumentation by laypersons or professional economists about topics such as money, jobs, budgets, debts, deficits, etc. By fallacy of composition I mean an argument of composition that commits a fallacy. An argument of composition is one which concludes that a whole or group has a certain property because the parts of the whole or members of the group have that property. An argument of composition may also be called a compositional argument. A fallacy is a common type of argument that appears to be correct but is actually incorrect.

It is important to distinguish between arguments of composition and fallacies of composition because not all compositional arguments are incorrect, let alone fallacious; rather, some are correct, indeed deductively valid, although not formally valid. My favorite example is the following: all the parts of this automobile have weight; therefore, the whole automobile has weight.

Note also that I am distinguishing between incorrect arguments and fallacious arguments (cf. Woods, 2013; Finocchiaro, 2014). In order to be fallacious, namely to be a fallacy, an argument must meet other conditions besides incorrectness: it must *seem* to be correct; it must be an instance of a *general type*; and it must occur *commonly or frequently*. Thus, although all fallacious arguments are incorrect, not all incorrect arguments are fallacious.

Note also that I have said nothing about the fallacy of division, or arguments of division, or divisional arguments. Such fallacies and arguments are often defined as being just the reverse of the fallacy and argument of composition. Then both composition and division are discussed under the same heading, with the pretext that they both involve reasoning about parts and wholes, or groups and members; thus, composition would be the special case when one reasons from parts or members to wholes or groups, and division would be the special case when one reasons from wholes or groups to parts or members.

There are several reasons for wanting to distinguish, even by way of introduction, between arguments and fallacies of composition on the one hand and arguments and fallacies of division on the other. One reason is that composition is reminiscent of universal generalization, which is deductively invalid, whereas division is reminiscent of universal instantiation, which is deductively valid; thus, we may expect composition to be problematic in ways in which division is not. Moreover, as we shall see, arguments and fallacies of composition are common and important in ways that have no counterpart for the case of division.

In short, please note that I will be talking about arguments and fallacies of composition, but not about arguments and fallacies of division (except when necessary). Still less, will I be talking about “the fallacy of composition and division,” in the singular.

2. The Woods-Walton thesis

Let me now begin my substantive discussion by calling attention to a 1977 article by John Woods and Douglas Walton entitled “Composition and Division.” That article is primarily a historical account of the origin of these concepts and an attempt to elaborate a formal analysis of their logical structure. However, there is also a short section dealing with the “importance of these fallacies,” and concluding that “from a point of view of significant errors and pitfalls of actual argumentation, composition and division are indeed fallacies of some genuine importance—easy enough to commit and mischievous enough to avoid committing” (Woods & Walton, 1977, p. 117).

A footnote to this passage brings us closer to our present topic. They note that the importance of the claim just made is “a perspective that non-philosophers can also share” (Woods & Walton, 1977, p. 280 fn. 6). And as an illustration, they quote from a 1973 economics textbook by Maurice Archer entitled *Introductory Macroeconomics: A Canadian Analysis*. The passage reads as follows:

The study of economic problems can be fascinating. However, ... there are several pitfalls ... These pitfalls can be listed under the following headings: preconceptions; self-interest; problems of definition; fallacy of composition; and false analogy ... By fallacy of composition we mean the mistake of assuming that what is true for part of a group must necessarily be true for the group as a whole. Thus, whereas an individual farmer may be better off by increasing his production, farmers as a whole may be worse off.” (Archer, 1973, pp. 45-46, as cited in Woods & Walton, 1977)

This easily missed detail is all that Woods and Walton say about this topic in their 1977 article. However, in their textbook entitled *Argument*, whose later editions are co-authored with Andrew Irvine, there is a whole chapter dealing with “Economic Reasoning” (Woods, Irving, & Walton, 2004). This chapter contains a significant elaboration of their 1977 footnote, besides containing discussions of other topics relevant to economic reasoning, such as decision theory, expected utility, minimax principles, Pareto optimality, and the prisoner’s dilemma. Let us examine that elaboration dealing with the fallacy of composition in economic reasoning.

The thesis mentioned in the subtitle of my paper, which I am attributing to Woods and Walton, has several parts. One claim is that economic reasoning is of “obvious importance ... for personal, domestic, regional, national and international affairs” (Woods & Walton, 1982, p. 203).

A second claim is that economic reasoning “is inherently liable to the fallacy of composition” (Woods, Irvine, & Walton, 2004, p. 251). Thirdly, this liability is connected with the fundamental division between microeconomics and macroeconomics and the problematic relationship between the two. The fourth claim is a qualification to the second: this liability does not mean that economics is not a science, or “that economists commit the fallacy of composition more often than other thinkers” (Woods, Irvine, & Walton, 2004, p. 251). On the contrary, fifthly, as I would put it, one could say that professional economists are thinkers who have mastered the art of avoiding the fallacy of composition in economic reasoning, and the art of exposing this fallacy when it is committed by laypersons, or even by other economists.

In advancing this multifaceted thesis, Woods, Irvine, and Walton (2004) explicitly point out that they are echoing claims advanced by economists themselves (p. 250). In fact, by way of illustration and substantiation, they quote a passage from a 1978 book by economist Leonard Silk entitled *Economics in One Lesson*. The passage reads as follows:

THE FALLACY OF COMPOSITION: It is often mistakenly assumed that what is true for the parts of a system is true for the system as a whole. If you stand up at a football game, you can see better, but if everybody stands up nobody can see better.

In economics, if you, as an individual, decide to save more out of your income, you will increase your wealth. But if everyone in the nation tries to save more out of income, this may reduce national wealth—by reducing, in succession, sales, the production of goods, the incomes of producers and their employees, and ultimately national savings and investment.

If you, as an individual, are able to raise your prices, this may be a good thing for your business. But if every business does the same, the obvious result will be inflation, a bad thing for the nation.

Balancing the budget so that outgo does not exceed income may be a sound rule for you and your family. But budget balancing does not always make sense for the national government; for the government to do so during a business slump when unemployment is rising would worsen the slump and increase unemployment.

Cutting wage rates may enable one employer to hire more workers; but cutting the wages of all workers may lead to fewer, not more, jobs—since workers would have less to spend on goods.

Thus, when we shift from micro- to macroeconomics, some key concepts change. (Silk, 1978, pp. 83-84, as cited in Woods, Irving, & Walton, 2004)

3. Argumentation scholars on economic reasoning and fallacy of composition

In this paper I want to pursue this thesis about the susceptibility of economic reasoning to the fallacy of composition. Before I do that, however, I want to briefly explore to what extent this underlying topic has been studied by scholars of informal logic, argumentation theory, and critical thinking.

To begin with, it is disappointing to find that, as far as I can tell, Woods and Walton themselves have not pursued the project, neither jointly nor separately. Of course, I don't need to remind the audience here that they have not been idle, but rather have worked hard in this field

and produced, separately, an impressive number and range of works. However, let me simply add an impression I have gotten from Woods's latest book on fallacies, an impression that is something of a constructive suggestion.

I am referring to the book published by Woods in 2013, entitled *Errors of Reasoning: Naturalizing the Logic of Inference*. A key strand of this book concerns the so-called "gang of eighteen" fallacies, namely affirming the consequent, denying the antecedent, hasty generalization, biased statistics, gambler's fallacy, *post hoc ergo propter hoc*, faulty analogy, *ad baculum*, *ad hominem*, *ad populum*, *ad verecundiam*, *ad ignorantiam*, *ad misericordiam*, begging the question and circularity, many questions, equivocation, composition and division, and straw man. Woods (2013) examines them one by one, and argues that each fails to satisfy one or more of the necessary conditions of being a fallacy. He does this for at least thirteen of them, suggesting that the same will apply to the others. The fallacy of composition happens to be one of the few which are not explicitly examined for this purpose. Now, my conjecture is that this non-examination of the fallacy of composition is no accident, and perhaps it is unlike the others and special in some way. This is what I am taking here as a constructive encouragement to pursue the present project.

Let us now look at other potentially relevant works in the scholarly literature. For this purpose, I have consulted a large number of works, and in each case I have tried to determine five things. The main question was whether or not a given work contains some discussion or even an awareness of the fallacy of composition in economic reasoning. To contextualize this question to some extent, I also checked whether or not each work discussed the fallacy of composition *per se* and economic reasoning *per se*. Two other related questions were whether or not the given work discusses the fallacy of division, and whether or not it could be regarded to have an orientation that focuses seriously on actual argumentation. It will be useful to discuss the results separately for the cases of textbooks and for scholarly books and articles.

Of the thirty-one textbooks examined, none, other than the three editions of the textbook by Woods and Walton, discuss the fallacy of composition in economics. This is so despite the fact that four out of the other textbooks do cover economic reasoning, and ten mention the fallacy of composition; that is, these two subsets of four and ten are disjoint. Even greater are the numbers of textbooks that mention the fallacy of division (eleven) and that have some focus on actual argumentation (sixteen). These results are presented in tabular form in Appendix I.

The results for scholarly works are similar. To be specific, out of twenty-four works examined, the focus on actual argumentation is relatively high (twelve works), but the inclusion of economic reasoning is less so (only five works). A high proportion (seventeen) do mention the fallacy of composition, and yet only four connect it to economic reasoning. These are the 1977 article by Woods and Walton, the essay by Trudy Govier stemming from her 2006 keynote address at ISSA, a paper by James Gough and Mano Daniel presented at the 2008 O SSA conference, and Ritola's (2009b) commentary of that paper; but even these four works discuss the issue in an incidental or secondary manner. The table in Appendix II summarizes these results.

4. Pursuing the project

Thus, it seems that the pioneering effort of Woods and Walton (1977) has been largely ignored. I find such a neglect unfortunate, but rather than letting such a situation depress me, I want to derive some extra motivation to pursue the problem further. For I am convinced that the topic is

an extremely important one, that is, the topic of the susceptibility of economic reasoning to the fallacy of composition. This conviction is based, not on the writings of philosophers and argumentation scholars (as we have just seen), but on the writings of economists, who constantly harp on this fallacy. In fact, this situation creates an opportunity that is simply too promising to be missed.

That is, the project of pursuing a further study of the fallacy of composition in economics fits very well with the approach to argumentation studies which I have followed for a long time. Let me explain. This project exemplifies an empirical historical approach to argumentation theory which I have previously practiced to good effect many times (cf. Finocchiaro, 2005). Moreover, it instantiates an approach that studies meta-argumentation (arguments about arguments) and has been similarly successful in the past (cf. Finocchiaro, 2013b). Specifically, it studies the fallacy of composition by focusing on actual meta-arguments claiming that some ground-level argument commits this fallacy. Finally, this connects with economic reasoning in various ways: insofar as professional economists frequently claim that common people tend to commit this fallacy when thinking about topics like debts and deficits, and that a knowledge of economic science can free them from such pitfalls; and insofar as in controversial contexts, economists sometimes accuse one another of committing the fallacy of composition.

5. Economists on the fallacy of composition

We have seen above that, as reported by Woods and Walton (1977), economists Archer and Silk are keen to point out the susceptibility of economic reasoning to the fallacy of composition. But they are not the only such economists, by any means. They are advancing a claim that is widely shared among economists, and indeed they are probably echoing the views of the distinguished and famous economist Paul Samuelson, Nobel laureate in economics in 1970.

5.1. Textbooks

In fact, the concern expressed by Archer and Silk is found in a textbook by Samuelson, which was the most successful and popular economics textbook of the twentieth century. The first edition of Samuelson's textbook was published in 1948, and there were many other editions, for example a thirteenth, published in 1989, and co-authored with his former student Nordhaus.

For example, in the third edition, Samuelson (1955) has an introductory chapter in which one of several sections is entitled "the whole and the part: the 'fallacy of composition'" (p. 9). In it, he starts by giving seven examples of paradoxical-sounding statements that are nevertheless true, like those later echoed by Archer and Silk. Samuelson (1955) then claims that these statements can be easily and clearly shown to be true, as he actually does at various points in the book, when the various particular topics come up for detailed discussion. And then comes the connection with the present topic: "many of the above paradoxes hinge upon one single confusion or fallacy, called by logicians the 'fallacy of composition'. In books on logic, this is defined as follows: '*A fallacy in which what is true of a part is, on that account alone, alleged to be also true of the whole*'" (Samuelson 1955, p. 10). After this preliminary discussion in the introductory chapter, later chapters discuss in detail about a dozen examples of fallacies of composition, at various points when the substantive topics become relevant. Especially incisive are the discussions of individual banks vs. the banking system, private debt vs. public debt, and the connection between commodity prices and land rents (Samuelson, 1955, pp. 273, 350-52,

504-505).

Another pedagogical discussion of the fallacy of composition is found in an economics textbook available on the internet from an organization called “Study.com” (cf. also Wray, 2009). Entitled *Introduction to Macroeconomics*, the book has sixteen chapters, each subdivided into a number of sections, for a total of 164 sections. The third chapter, dealing with “Demand, Supply and Market Equilibrium,” has twelve sections, the last one of which is on “The Fallacy of Composition in Economics: Definition and Examples” (Study.com, 2003-2016, ch. 3).

Its definition is a typical one: “The fallacy of composition arises when an individual assumes something is true of the whole just because it is true of some part of the whole” (Study.com, 2003-2016, ch. 3 lesson 12). However, its introductory example is somewhat more interesting:

Have you ever been at a sporting, musical, or community event and thought to yourself, ‘If we leave a few minutes early, we can beat all the traffic?’ You might discover that everyone else was thinking the same thing, and it still ends up taking a long time to get out of the parking lot. You’ll only manage to beat traffic when just a few people are thinking that way, but not when everyone at the event has the same idea.” (Study.com, 2003-2016, ch. 3 lesson 12)

Such an example is also mentioned by economist Paul Krugman (1996/2009) to illustrate a similar point, although in that context he does not use the term fallacy of composition (pp. 35-36).

Moreover, this internet textbook advances a helpful explanation of the occurrence of this economic fallacy:

Why does this fallacy exist, and why do we think this way sometimes? The answer is that we usually reason and draw conclusions from our own situation and individual experiences. It is easiest to examine our situation, and then reason that the same actions would have the same results for society and the economy as a whole. Although this may be true in some circumstances, it is not always. Sometimes, it may simply be reasoning that results from not having all the necessary facts and information. You may only know what you have experienced yourself.” (Study.com, 2003-2016, ch. 3 lesson 12)

And again, this explanation is reminiscent of a similar thesis advanced by the famous economist Henry Hazlitt, in a book entitled *Economics in One Lesson*, but without the fallacy-of-composition terminology (Hazlitt, 1946/1979, p. 17; cf. Finocchiaro, 2013a, pp. 163-66).

5.2. Professional technicalities

Let us now move from the pedagogical context of textbooks to the research context of articles in professional journals. An instructive example is provided by a 1992 article entitled “A Fallacy of Composition”, published by an economist named Ricardo Caballero in the *American Economic Review*, the official journal of the American Economic Association.

Substantively speaking, the article discusses the relationship between microeconomics and macroeconomics with regard to the pricing of commodities. The main question is whether

there exists an asymmetry between the increase and the decrease of prices, with upward movements being much more common than downward movements (Caballero, 1992).

The article begins by quoting the definition of the fallacy of composition given by Samuelson, which I myself quoted above. Then Caballero (1992) explicitly tells us that “in this paper I attempt to isolate the mechanism underlying the course of several *fallacies of composition*” (p. 1279). The main one of these fallacies is described with these words: “the basic insight developed in this paper shows that asymmetric policies at the firm level do not necessarily imply asymmetries in upward and downward adjustments of the aggregate price level” (Caballero, 1992, p. 1279). In other words, it is fallacious to argue that just because individual firms have a strong tendency to raise prices but not to lower them, in the economy as a whole there is the same (level of) tendency for prices to increase but not to decrease.

The reason for the incorrectness of such inferences involves technical details in the mathematics of probability theory. In other words, the premises in Caballero’s (1992) own meta-argument are technical, mathematical, and probabilistic. Nevertheless, his own qualitative summaries give us a glimpse of the key problem. In the introductory section, he tells us that “I argue that the essence of these fallacies relies on the fact that direct microeconomic arguments do not consider the strong restrictions that probability theory puts on the joint behavior of many units that are less than fully synchronized” (Caballero, 1992, p. 1279). And in the concluding section, after some qualifications to the effect that he is not saying that microeconomics is irrelevant to macroeconomics, he clarifies that “the paper does say, however, that *direct application of microeconomic explanations to aggregate data can be seriously misleading, since they typically do not consider the natural probability forces that tend to undo such explanations*” (Caballero, 1992, p. 1292).

Let us now examine a more recent but less technical article, published in 2002 in a journal entitled *The World Economy*, by an economist named Jörg Mayer, affiliated with the United Nations Conference on Trade and Development (UNCTAD). The article bears a very ambitious title, namely “The Fallacy of Composition: A Review of the Literature.” However, as might be expected from the position of the author and the title of the journal, the substantive topic is international trade and the behavior of various countries in the context of the evolution of the world economy. It may be summarized as follows

Consider world economic development since World War II. During an initial period, several developing countries (e.g., South Korea, Taiwan, Hong Kong, and Singapore) experienced great economic progress by exporting cheaply manufactured goods to developed countries. On the basis of this experience, many other countries (especially in East and South Asia) started manufacturing and exporting cheap goods to developed countries. The thinking underlying such policies could be claimed to involve the fallacy of composition (Mayer, 2002).

In fact, many of the second-phase exporting countries did not experience the anticipated economic progress comparable to the earlier exporting countries. There were two reasons for this (relative) failure. One was that as the supply of manufactured goods exported by all developing countries increased, their prices tended to decrease. The second reason was that the developed countries importing such goods started instituting protective tariffs against the cheap imports (Mayer, 2002).

These reasons help us understand why it was wrong (fallacious?) to argue that what had happened to some developing countries, and what could happen to any one particular country, could happen to all.

However, the situation was dynamic and more complicated. In fact, other developments started taking place. One was that among developing countries, some (especially those with a longer history of exports) started focusing on products of higher quality, requiring greater labor skills, more technology, and more capital investment. Such products did not suffer from the competition of those produced by the second wave of exporting developing countries. That is, a division arose among developing countries between two main subgroups, one at a relatively higher stage of economic development, the other at a relatively lower stage (Mayer, 2002).

The second dynamic complication was that developed countries started undergoing an additional level of development, to counteract the competition experienced by their own industries and emanating from the cheap imports. The developed countries started moving more and more away from manufacturing and toward services, and eventually toward computerization and information processing (Mayer, 2002).

Where does this leave the compositional problem in international trade? It seems that compositional arguments about international trade provide good examples of the fallacy of composition. However, the considerations that generate this fallaciousness in any particular case are subject to change, in part because of the perception of this fallaciousness. When such changes happen, the risk of committing the fallacy of composition does not completely disappear, but merely affects other aspects of the situation (Mayer, 2002).

To get a flavor of this kind of discussion, the following quotation will have to suffice:

The fallacy of composition—sometimes also called the ‘adding-up problem’—means that what is viable for one small exporter acting in isolation may not be viable for a group of exporters acting at the same time ... Bhagwati (1958) first discussed the fallacy of composition in the context of immiserising growth. Since then, at least four distinct versions of the fallacy of composition have been presented in the literature, namely (i) an early version pioneered by Cline (1982) who emphasizes protectionist policies in developed countries—beyond some critical level of import penetration, exports from developing countries will face rapid escalation of protective barriers in developed countries—(ii) a more recent version used by Faini, Clavijo and Senhadji-Semlali (1992) who focus on the elasticity of export demand from a partial equilibrium point of view—the elasticity of export demand for a group of countries is smaller in absolute value than the corresponding elasticity for an individual country—(iii) a version identified by Havrylyshyn (1990) and first tested by Martin (1993) that highlights the general equilibrium nature of the fallacy of composition ... a further (iv) version of the fallacy of composition argument is whether manufactured exports—both on aggregate and from specific manufacturing sectors—from developing countries have been falling in price compared to those of developed countries. (Mayer, 2002, pp. 875-77)

5.3. Public-issue discussions

Let us now examine some examples of economic reasoning from a different context: that is, policy discussions by columnists aimed at intelligent and thoughtful lay persons. In this regard,

the columns of Paul Krugman are very instructive.¹ Krugman is, of course, the recipient of the 2008 Nobel Prize in economics and a columnist for the *New York Times*.

In December 2013, the American Congress was debating whether to extend unemployment benefits; the Democratic Party was in favor, and the Republican Party against. On December 9, Krugman published a column entitled “The Punishment Cure.” He advanced several criticisms of the Republicans, one of which was the following:

the G.O.P. answer to the problem of long-term unemployment is to increase the pain of the long-term unemployed: Cut off their benefits, and they’ll go out and find jobs. How, exactly, will they find jobs when there are three times as many job-seekers as job vacancies? ... You might be tempted to argue that more intense competition among workers would lead to lower wages, and that cheap labor would encourage hiring. But that argument involves a fallacy of composition. Cut the wages of some workers relative to those of other workers, and those accepting the wage cuts may gain a competitive edge. Cut everyone’s wages, however, and nobody gains an edge. All that happens is a general fall in income—which, among other things, increases the burden of household debt, and is therefore a net negative for overall employment. (Krugman, 2013b)

Needless to say, such fallacy charges need analysis and evaluation, in the sense that we want to know exactly what the argument being criticized is, what the meta-argument being advanced is, and whether the latter is correct. However, for the moment I cannot pursue such analysis and evaluation. Instead I want to present some more empirical historical material.

Now, it turns out that, on at least one occasion, Krugman himself has been charged with committing a fallacy of composition. This fallacious reasoning allegedly happened in a *New York Times* blog entitled “Small Is Beautiful,” posted on February 25, 2011. The substantive topic was the connection between the stimulus spending which the American government enacted in 2009-2010 and unemployment, and, more specifically, the existence and national effects of cross-state differences. Krugman (2011) was commenting on the views of several other economists, and was advancing other arguments besides the one to be quoted presently. The problematic passage is the following: “more federal spending in a given state or county creates more jobs. And the burden of proof should always have been on the stimulus critics to explain why this doesn’t mean that stimulus spending creates jobs at the national level too” (Krugman, 2011).

In a blog entitled “Small Is Irrelevant (in Macro),” posted the same day (February 25), economist Scott Sumner (2011) criticized this argument as follows:

“it’s a near perfect example of the fallacy of composition. Every single anti-stimulus model would predict exactly the same finding at the micro level. If the federal government builds a billion dollar military base in Fargo, North Dakota, I think all economists agree that the number of jobs increases—in Fargo, North Dakota. Does the number of jobs increase at the national level? Very possibly yes, but nothing in ... [Krugman’s argument] addresses that question.” And, connecting this issue to the distinction between microeconomics and macroeconomics, Sumner (2011) added that “micro studies can’t tell us whether

¹ Besides the works explicitly cited below, other relevant writings are Krugman (2012a; 2012b; 2013a; 2015). Another noteworthy example is Kelly and Kelly (2015).

fiscal stimulus works. Micro studies can't tell us whether monetary stimulus works ... Micro studies can't tell us anything about macro. That's why macro is a different field." (Sumner, 2011)

Let us now look at a more complicated case, more complicated not because of intrinsic complexities, but because the discussion includes some analysis and evaluation. That is, in this case, the material I found for our own reflection itself contains the sort of thing which earlier I postponed to a subsequent stage of this investigation.

This case involves a fallacy charge made by Krugman in a blog posted on September 3, 2010, entitled "Paradoxes of Deleveraging and Releveraging." The substantive topic was, again, the fiscal stimulus of 2009-2010, but now in the context of a general economic problem, namely the new debt generated by such spending. Krugman claimed the following, where I have inserted in brackets some labels:

Whenever the issue of fiscal stimulus comes up, you can count on someone chiming in to say, "Only a moron could believe that the answer to a problem created by too much debt is to create even more debt." It sounds plausible—but it misses the key point: [a] there's a fallacy of composition here. [b] When everyone tries to pay off debt at the same time, the result is contraction and deflation, which ends up making the debt problem worse even if nominal debt falls. On the other hand, [c] a strong fiscal stimulus, by expanding the economy and creating moderate inflation, can actually help resolve debt problems. (Krugman, 2010)

Then proposition [b] is supported with the historical evidence that [d] "from 1929 to 1933, everyone was trying to pay down debt—and the debt/GDP ratio skyrocketed thanks to contraction and deflation" (Krugman, 2010). And proposition [c] is supported with the historical evidence that [e] "during and immediately after WWII, there was massive borrowing—but GDP grew faster than debt, and the debt burden ended up falling" (Krugman, 2010). The whole argument is: [a] because [b] and [c]; [b] because [d]; and [c] because [e].

This argument was criticized by an economist named William Anderson, in a blog dated September 5, entitled "Fallacy of Composition, or a Non Sequitur?" Anderson (2010) argues that Krugman's own argument is a non sequitur partly because during World War II the economic growth (the growth of the GDP) was not caused by the government's massive borrowing; here, in [e], Krugman is presumably confusing correlation with causation. Moreover, Anderson (2010) claims that such massive borrowing was not accompanied by economic prosperity. In short, presumably, Krugman's conclusion [a] does not follow from his own evidence.²

6. Questions

This survey seems to confirm the susceptibility of economic reasoning to the fallacy of composition—perhaps with a vengeance. That is, it is not just laypersons who have such a

² This exchange elicited a number of blog responses, including one by "Anonymous" dated April 4, 2011, which is of some interest in the present context: "Really? You are so good that you are at F[rostburg] State [University, Maryland] trying to challenge a Nobel prize winning economist, a professor at Princeton and London School—with an MIT PhD. Sorry, nice try but you aren't in the same league. And it's obvious" (Anonymous, 2011). In the present context, I would ask: is this an *ad hominem* fallacy, a plausible inductive argument, or a weak inductive argument?

tendency, but also economists and businessmen involved in pricing policies and in international trade, as well as distinguished economists of the caliber of Paul Krugman. However, other questions need to be asked and answered.

One question is to determine what exactly is the concept of fallacy of composition which such economic discussions are operating with. Despite Samuelson's (1955) reference to logicians and logic textbooks, it may or may not be the case that their concept coincides with the one in such economic discussions.

Another question is, exactly what is the structure of such critical meta-arguments. Consider the following sequence of increasing complexity:

(M1) *Meta-argument 1:*

- (M1a) argument A is an argument of composition, because ...;
- (M1b) therefore, argument A is a fallacy of composition.

(M2) *Meta-argument 2:*

- (M2a) argument A is an argument of composition because ...;
- (M2b) argument A is incorrect, because ...;
- (M2c) therefore, argument A is a fallacy of composition.

(M3) *Meta-argument 3:*

- (M3a) argument A is an argument of composition because ...;
- (M3b) argument A is incorrect, because ...;
- (M3c) argument A appears to be correct, because ...;
- (M3d) therefore, argument A is a fallacy of composition.

(M4) *Meta-argument 4:*

- (M4a) argument A is an argument of composition because ...;
- (M4b) argument A is incorrect, because ...;
- (M4c) argument A appears to be correct, because ...;
- (M4d) argument A is a common or frequent type, as shown by ...;
- (M4e) therefore, argument A is a fallacy of composition.

Although it might be excessively pedantic to require critiques like (M4), clearly (M1) is inadequate. Indeed (M1) is itself incorrect, since, as mentioned in the Introduction, some compositional arguments are valid. Moreover, (M1) may be a fallacy; that would depend, in part, on how common (M1) is in these discussions.

Similar remarks apply to (M2). However, one of its issues is intrinsically important, independently of its connection with other issues; that is, it is important to determine whether or not the ground-level compositional argument is correct, independently of its fallaciousness. In this regard, a plausible-sounding general principle proposes that arguments from the properties of parts or members to the properties of wholes or aggregates are correct if and only if the properties are absolute and structure-independent (van Eemeren & Grootendorst, 1992, pp. 174-83, 1999; van Eemeren & Garssen 2010). Unfortunately, as far as I can tell, in economic reasoning the properties in question are usually relative and structure dependent. Thus, although I don't think it would be proper to abandon the search for such general principles of evaluation, it

seems they have to be grounded on the study of real, realistic, and relevant examples like the ones presented here.

These are some of the many questions that need to be asked and answered about the problem of the susceptibility of economic reasoning to the fallacy of composition.

APPENDIX I
TEXTBOOKS ON FALLACY OF COMPOSITION IN ECONOMICS

Work	Fallacy of composition	Fallacy of division	Actual arguments	Economic reasoning	Fall comp economics
Angell 1964	No	Yes	Yes	No	No
Beardsley 1966	No	No	No	No	No
Beardsley 1967	No	No	Yes	Yes	No
Cederblom & Paulsen 2012	No	No	No	No	No
Chaffee 2009	No	No	Yes	No	No
Cohen & Nagel 1934	Yes	Yes	Yes	No	No
Copi, IL, 1986	No	No	Yes	No	No
Copi & Cohen 1994, 9th edn	Yes	Yes	No	No	No
Damer 1980	Yes	Yes	No	No	No
Epstein 2002	No	No	No	No	No
Fisher 1988	No	No	Yes	Yes	No
Fogelin 1982	No	No	Yes	No	No
Freeman 1988	No	No	No	No	No
Govier 2010	Yes	Yes	No	No	No
Groarke & Tindale 2008	No	No	Yes	No	No
Hintikka & Bachman 1991	No	No	No	No	No
Hurley 2003	Yes	Yes	No	No	No
Johnson & Blair 2006	No	No	Yes	No	No
Kahane 1971	No	No	Yes	No	No
Kahane 1973	Yes	Yes	No	No	No
Kelley 1990	No	No	No	No	No
Moore & Parker 1998	Yes	Yes	Yes	No	No
Salmon 2002	Yes	Yes	No	No	No
Scriven 1976	No	No	Yes	Yes	No
Thomas 1981	No	No	Yes	No	No
Toulmin Rieke & Janik 1979	Yes	Yes	Yes	Yes	No
Vaughn 2008	Yes	Yes	Yes	No	No
Woods Irvine Walton 2000	Yes	Yes	Yes	Yes	Yes
Woods Irvine Walton 2004	Yes	Yes	Yes	Yes	Yes
Woods & Walton 1982	Yes	Yes	Yes	Yes	Yes
Wright 2001	No	No	Yes	No	No

APPENDIX II
SCHOLARSHIP ON FALLACY OF COMPOSITION IN ECONOMICS

Work	Fallacy of composition	Fallacy of division	Actual arguments	Economic reasoning	Fall comp economics
Bar-Hillel 1964	Yes	No	No	No	No
Blair 2012	No	No	Yes	No	No
Broyles 1975	Yes	Yes	No	No	No
Cole 1965	Yes	No	No	No	No
Davies 2002	Yes	Yes	Yes	No	No
Eemeren & Garssen 2010	Yes	Yes	No	No	No
Eemeren&Grootendorst 1999	Yes	Yes	No	No	No
Eemeren&Grootendorst 2004	Yes	Yes	No	No	No
Eemeren et al 2014	Yes	Yes	No	No	No
Gough & Daniel 2009	Yes	No	Yes	Yes	Yes
Govier 2002	Yes	Yes	Yes	No	No
Govier 2007/2009	Yes	No	Yes	Yes	Yes
Hamblin 1970	Yes	Yes	No	No	No
Johnson 2000	No	No	No	No	No
Paul 1990	No	No	Yes	Yes	No
Perelman & O-T 1958	Yes	Yes	Yes	No	No
Pole 1981	Yes	Yes	Yes	Yes	No
Ritola 2009b	Yes	No	Yes	Yes	Yes
Rowe 1962	Yes	Yes	No	No	No
Toulmin 1958	No	No	No	No	No
Weinstein 2013	No	No	Yes	No	No
Wohlrapp 2014	No	No	Yes	No	No
Woods 2013	No	No	No	No	No
Woods & Walton 1977	Yes	Yes	(Yes)	(Yes)	Yes

References

- Anderson, W. L. (2010). Fallacy of composition, or a non sequitur? Retrieved December 14, 2015 from <http://krugman-in-wonderland.blogspot.com/2010/09/fallacy-of-composition-or-non-sequitur.html>
- Angell, R. B. (1964). *Reasoning and Logic*. New York: Appleton.
- Archer, M. (1973). *Introductory Macroeconomics: A Canadian analysis*. Toronto: Macmillan.
- Bar-Hillel, Y. (1964). More on the fallacy of composition. *Mind* 73, 125-26.
- Beardsley, M. C. (1966). *Thinking Straight: Principles of Reasoning for Readers and Writers* (3rd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Beardsley, M.C. (Ed.). (1967). *Modes of argument*. Indianapolis: Bobbs-Merrill.
- Bhagwati, J. (1958). Immiserizing growth: A geometrical note. *Review of Economic Studies* 25, 201-205.
- Blair, J. A. (2012). *Groundwork in the Theory of Argumentation*. Dordrecht: Springer.

- Broyles, J. E. (1975). The fallacies of composition and division. *Philosophy and Rhetoric* 8, 108-113.
- Caballero, R. J. (1992). A fallacy of composition. *American Economic Review* 82, 1279-92.
- Cederblom, J., & Paulsen, D. W. (2012). *Critical Reasoning* (7th ed.). Boston: Wadsworth, Cengage Learning.
- Chaffee, J. (2009). *Thinking Critically* (9th ed.). Boston: Houghton Mifflin Co.
- Cline, W. R. (1982). Can the East Asian model of development be generalized? *World Development* 10, 81-90.
- Cohen, M. R., & Nagel, E. (1934). *An Introduction to Logic and Scientific Method*. New York: Harcourt, Brace and Company.
- Cole, R. (1965). A note on informal fallacies. *Mind* 74, 432-33.
- Copi, I. M. (1986). *Informal Logic*. New York: MacMillan.
- Copi, I. M., & Cohen, C. (1994). *Introduction to Logic* (9th ed.). New York: MacMillan.
- Damer, T. E. (1980). *Attacking Faulty Reasoning*. Belmont, CA: Wadsworth.
- Davies, J. (2002). In response to: Trudy Govier's 'Collective responsibility and the fallacies of composition and division'. In: H. V. Hansen, C. W. Tindale, J. A., Blair, R. H. Johnson & R. C. Pinto (Eds.), *Argumentation and its Applications: Proceedings of the 4th International Conference of the Ontario Society for the Study of Argumentation (OSSA), 17-19 May 2001*. Windsor: OSSA. (CD-ROM. ISBN: 0-9683461-2-X).
- Eemeren, F. H. van, & Garssen, B. (2010). Linguistic criteria for judging composition and division fallacies. In: A. Capone (Ed.), *Perspectives on Language Use and Pragmatics: A Volume in Memory of Sorin Stati* (pp. 35-50). Munich: Lincom Europa.
- Eemeren, F. H. van, Garssen, B., Krabbe, E. C. W., Snoeck Henkemans, A. F., Verheij, B., & Wagemans, J. H. M. (2014). *Handbook of Argumentation Theory*. Dordrecht: Springer.
- Eemeren, F. H. van, & Grootendorst, R. (1992). *Argumentation, Communication, and Fallacies*. Hillsdale: Lawrence Erlbaum Associates.
- Eemeren, F. H. van, & Grootendorst, R. (1999). The fallacies of composition and division. In: J. Gerbrandy, M. Marx, M. de Rijke & Y. Venema (Eds.), *JFAK: Essays Dedicated to Johan van Benthem on the occasion of his 50th birthday*. Amsterdam: University of Amsterdam, Institute for Logic, Language, and Computation. Retrieved June 18, 2013 from www.ilc.uva.nl/j50/
- Eemeren, F. H. van, & Grootendorst, R. (2004). *A Systematic Theory of Argumentation: The pragma-dialectical approach*. Cambridge: Cambridge University Press.
- Epstein, R. L. (2002). *Critical thinking* (2nd ed.). Belmont, CA: Wadsworth.
- Faini, R., Clavijo, F. & Senhadji-Semlali, A. (1992). The fallacy of composition argument: Is it relevant for LDCs' manufactures exports? *European Economic Review* 36, 865-82.
- Finocchiaro, M. A. (2005). *Arguments about Arguments: Systematic, Critical, and Historical Essays in Logical Theory*. New York: Cambridge University Press.
- Finocchiaro, M. A. (2013a). Debts, oligarchies, and holisms: Deconstructing the fallacy of composition. *Informal Logic* 33, 143-74.
- Finocchiaro, M. A. (2013b). *Meta-argumentation: An Approach to Logic and Argumentation Theory*. London: College Publications.
- Finocchiaro, M. A. (2014). Essay-review of J. Woods's *Errors of Reasoning: Naturalizing the Logic of Inference*. *Argumentation* 28, 231-39.
- Finocchiaro, M. A. (2015a). The fallacy of composition: Guiding concepts, historical cases, and research problems. *Journal of Applied Logic* 13 (2), part B, 24-43.

DOI:10.1016/j.jal.2015.01.003

- Finocchiaro, M. A. (2015b). Ubiquity, ambiguity, and metarationality: Searching for the fallacy of composition. In: F. H. van Eemeren & B. Garssen (Eds.), *Reflections on Theoretical Issues in Argumentation Theory* (pp. 131-41). Dordrecht: Springer.
- Fisher, A. (1988). *The Logic of Real Arguments*. Cambridge: Cambridge University Press.
- Fogelin, R. J. (1982). *Understanding Arguments: An Introduction to Informal Logic* (2nd ed.). New York: Harcourt Brace Jovanovich.
- Freeman, J. B. (1988). *Thinking Logically*. Englewood Cliffs, NJ: Prentice-Hall.
- Gough, J. E., & Daniel, M. (2009). The fallacy of composition. In: J. Ritola (Ed.), *Argument Cultures: Proceedings of the 8th International Conference of the Ontario Society for the Study of Argumentation (OSSA), 3-6 June 2009*. Windsor, ON: OSSA. (CD-ROM, ISBN 978-0-920233-51-1).
- Govier, T. (2002). Collective responsibility and the fallacies of composition and division. In: H. V. Hansen, C. W. Tindale, J. A., Blair, R. H. Johnson & R. C. Pinto (Eds.), *Argumentation and its Applications: Proceedings of the 4th International Conference of the Ontario Society for the Study of Argumentation (OSSA), 17-19 May 2001*. Windsor: OSSA. (CD-ROM. ISBN: 0-9683461-2-X).
- Govier, T. (2007). Duets, cartoons, and tragedies: Struggles with the fallacy of composition. In: F. H. van Eemeren, J. A. Blair, C. A. Willard & B. Garssen (Eds.), *Proceedings of the Sixth Conference of the International Society for the Study of Argumentation, June 2006*, (pp. 505-11), Amsterdam: Sic Sat.
- Govier, T. (2009). Duets, cartoons, and tragedies: Struggles with the fallacy of composition. In: F. H. van Eemeren & B. Garssen (Eds.), *Pondering on Problems of Argumentation* (pp. 91-104). Dordrecht: Springer.
- Govier, T. (2010). *A Practical Study of Arguments* (7th ed.). Belmont, CA: Wadsworth.
- Groarke, L. A., & Tindale, C. W. (2008). *Good Reasoning Matters*. Don Mills, ON: Oxford University Press.
- Hamblin, C. L. (1970). *Fallacies*. London: Methuen. (Reprint. 1986. Newport News, VA: Vale Press.)
- Hansen, H. V., Tindale, C. W., Blair, J. A., Johnson, R. H. & Pinto, R. C. (Eds.). (2002). *Argumentation and its Applications: Proceedings of the 4th International Conference of the Ontario Society for the Study of Argumentation (OSSA), 17-19 May 2001*. Windsor: OSSA. (CD-ROM. ISBN: 0-9683461-2-X).
- Havrylyshyn, O. (1990). Penetrating the fallacy of export composition. In: H. Singer, N. Hatti & T. Tandon (Eds.), *North-South Trade in Manufactures*. New Delhi: Indus Publishing Co.
- Hazlitt, H. (1979). *Economics in One Lesson*. New Rochelle: Arlington House Publishers. (Original work published 1946)
- Hintikka, J., & Bachman, J. (1991). *What If ...? Toward Excellence in Reasoning*. Mountain View, CA: Mayfield Publishing Co.
- Hurley, P. J. (2003). *A Concise Introduction to Logic* (8th ed.). Belmont, CA: Wadsworth.
- Johnson, R. H. (2000). *Manifest Rationality: A Pragmatic Theory of Argument*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Johnson, R. H., & Blair, J. A. (2006). *Logical Self-Defense*. New York: International Debate Education Association.
- Kahane, H. (1971). *Logic and Contemporary Rhetoric*. Belmont, CA: Wadsworth.
- Kahane, H. (1973). *Logic and Philosophy* (2nd ed.). Belmont, CA: Wadsworth.

- Kelley, D. (1990). *The Art of Reasoning* (Expanded ed.). New York: Norton.
- Kelly, W. A., & Kelly, E. S. (2015, February 4). Obama and the ‘fallacy of composition’. *The Wall Street Journal*. Retrieved March 18, 2015 from <http://www.wsj.com/articles/bill-kelly-and-elizabeth-sawyer-kelly-obama-and-the-fallacy-of-composition-1423095533>
- Krugman, P. (1996). A country is not a company. *Harvard Business Review*, January-February, 40-51.
- Krugman, P. (2009). *A Country Is Not a Company*. Boston: Harvard Business Press. (Original work published 1996)
- Krugman, P. (2010). Paradoxes of deleveraging and releveraging. Retrieved December 17, 2015 from <http://krugman.blogs.nytimes.com/2010/09/03/paradoxes-of-deleveraging-and-releveraging/>
- Krugman, P. (2011). Small is beautiful. Retrieved March 1, 2016 from <http://krugman.blogs.nytimes.com/?s=small+is+beautiful>
- Krugman, P. (2012a). *End This Depression Now!* New York: Norton.
- Krugman, P. (2012b, January 2). Nobody understands debt. *New York Times*, p. A21. Retrieved December 15, 2015 from http://www.nytimes.com/2012/01/02/opinion/krugman-nobody-understands-debt.html?_r=0
- Krugman, P. (2013a, January 8). Austerity wrought pain, no gain. *Las Vegas*, p. 3. Retrieved from <http://lasvegassun.com/news/2013/jan/08/austerity-wrought-pain-no-gain/#.VHPVyW1c75E.gmail>
- Krugman, P. (2013b, December 9). The punishment cure. *The New York Times*. Retrieved from http://www.nytimes.com/2013/12/09/opinion/krugman-the-punishment-cure.html?_r=0
- Krugman, P. (2015, October 4). Boehner ends era of budget blackmail, but madness lives on. *Las Vegas Sun*, p. 5.
- Martin, W. (1993). The fallacy of composition and developing country exports of manufactures. *The World Economy* 16, 159-72.
- Mayer, J. (2002). The fallacy of composition: A review of the literature. *The World Economy* 25, 875-94.
- Moore, B. N., & Parler, R. (1998). *Critical Thinking* (5th ed.). Mountain View, CA: Mayfield Publishing Co.
- Paul, R. W. (1990). *Critical Thinking*. A. J. A. Binker (Ed.). Rohnert Park, CA: Center for Critical Thinking and Moral Critique, Sonoma State University.
- Perelman, C., & Olbrechts-Tyteca, L. (1969). *The New Rhetoric: A Treatise on Argumentation*. (J. Wilkinson & P. Weaver, Trans.). Notre Dame: University of Notre Dame.
- Pole, N. (1981, June). Part/whole fallacies. *Informal Logic Newsletter* 3 (3), 11-13.
- Ritola, J. (Ed.). (2009a). In: J. Ritola (Ed.), *Argument Cultures: Proceedings of the 8th International Conference of the Ontario Society for the Study of Argumentation (OSSA), 3-6 June 2009*. Windsor, ON: OSSA. (CD-ROM, ISBN 978-0-920233-51-1)
- Ritola, J. (2009b). Commentary on James E. Gough and Mano Daniel’s “The Fallacy of Composition”. In: J. Ritola (Ed.), *Argument Cultures: Proceedings of the 8th International Conference of the Ontario Society for the Study of Argumentation (OSSA), 3-6 June 2009*. Windsor, ON: OSSA. (CD-ROM, ISBN 978-0-920233-51-1)
- Rowe, W. L. (1962). The fallacy of composition. *Mind* 71, 87-92.
- Salmon, M. (2002). *Introduction to Logic and Critical Thinking* (4th ed.). Wadsworth Thomson Learning.
- Samuelson, P. A. (1955). *Economics: An Introductory Analysis* (3rd ed.). New York: McGraw-

- Hill.
- Samuelson, P. A., & Nordhaus, W. D. (1989). *Economics* (13th ed.). New York: McGraw-Hill.
- Scriven, M. (1976). *Reasoning*. New York: McGraw-Hill.
- Silk, L. (1978). *Economics in Plain English*. New York: Simon and Schuster.
- Study.com. (2003-2016). The fallacy of composition in economics: Definitions and examples. In, Introduction to macroeconomics (ch. 3, lesson 12). Retrieved from <http://study.com/academy/lesson/the-fallacy-of-composition-in-economics-definition-examples.html>
- Sumner, S. (2011, February 25). Small is irrelevant (in macro). Retrieved December 15, 2015 from <http://www.themoneyillusion.com/?p=9056>
- Thomas, S. N. (1981). *Practical Reasoning in Natural Language* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Toulmin, S. E. (1958). *The Uses of Argument*. Cambridge: Cambridge University Press.
- Toulmin, S., Rieke, R., & Janik, A. (1979). *Introduction to Reasoning*. New York: Macmillan.
- Vaughn, L. (2008). *The Power of Critical Thinking*. New York: Oxford University Press.
- Weinstein, M. (2013). *Logic, Truth and Inquiry*. London: College Publications.
- Wohlraup, H. R. (2014). *The Concept of Argument. A Philosophical Foundation*. Berlin: Springer.
- Woods, J. (2013). *Errors of Reasoning: Naturalizing the Logic of Inference*. London: College Publications.
- Woods, J., Irvine, A., & Walton, D. (2000). *Argument: Critical Thinking, Logic and the Fallacies*. Toronto: Prentice-Hall.
- Woods, J., Irvine, A., & Walton, D. (2004). *Argument: Critical Thinking, Logic and the Fallacies* (2nd ed.). Toronto: Prentice-Hall.
- Woods, J., & Walton, D. N. (1977). Composition and division. *Studia Logica* 36, 381-406. Reprinted in Woods & Walton (1989), *Fallacies: Selected Papers 1972-1982* (pp. 93-119, 279-81). Dordrecht: Foris Publications.
- Woods, J., & Walton, D. N. (1982). *Argument: The Logic of Fallacies*. Toronto: McGraw-Hill Ryerson Limited.
- Woods, J., & Walton, D. N. (1989). *Fallacies: Selected Papers 1972-1982*. Dordrecht: Foris Publications.
- Wray, L. R. (2009). Teaching the fallacy of composition: The federal budget deficit. Retrieved October 19, 2012 from <http://neweconomicperspectives.org/2009/08/teaching-fallacy-of-composition-federal.html>
- Wright, L. (2001). *Critical Thinking*. New York: Oxford University Press.