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DEFINITION WITHIN
THE STRUCTURE OF ARGUMENTATION

Abstract: The purpose of this paper is to precisify and compare three relationships between definition and argumentation: argumentation about definition, argumentation from definition and argumentation by definition. Some modification of the standard understanding of these relationships is suggested. Additionally, it is argued that although real definitions are fallible and subject to revision and change, this does not imply that they have to be persuasive, manipulative definitions.

Keywords: real definition, nominal definition, stipulative definition, lexical definition, persuasive definition, manipulative definition, argumentation, evaluation of definition and argumentation, condition of adequacy

1. Introduction

Let us begin with some general remarks on logic in the broad sense, formal logic, informal logic (or critical thinking) and differences between formal and informal logic. It can be said that logic in the broad sense consists of formal logic (i.e. the logic of inference), the logic of language (i.e. logical/formal semiotics or semantics) and the logic of cognition or of knowledge (epistemology, formal epistemology).

The field of formal logic is divided into traditional and contemporary logic. Contemporary logic breaks down into classical and non-classical, mathematical and philosophical. The distinction between formal logic and its metalogic is also useful. Metalogic consists of model theory, definition theory, recursive theory and proof theory. Set theory is considered a part of formal logic.[1]

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[1] Some Polish logicians have played an important role in the development of formal logic (including the formal theory of definition), see e.g. Tarski 1994; Słupecki, Borkowski 1967; Kuratowski, Mostowski 1976; Grzegorczyk 1974; Adamowicz, Zbierski 1997; the history of this topic see e.g. Kamiński 1977.

Informal logic can be characterised as a theory and a practice (art), which investigates a set of rules, useful for an analysis and evaluation of formal (structural) and material correctness of everyday human thinking. Informal logic (critical thinking) instructs:

a) how to express questions correctly (a theory of questions/problems),[2]
b) how to define words and objects (a theory of definition),
c) how to classify different concepts and objects (a theory of classification),
d) how to determine when instances of reasoning, persuasion, argumentation and justification are correct and when they are incorrect (a theory of reasoning, of persuasion and manipulation, of argumentation, of justification[3]),
e) how to discuss various topics in a proper and effective way (a theory of discussion/discourse),
f) how to competently use language as a tool of communication (a theory of linguistic communication, a theory of language),
g) how knowledge on a specific topic may be gained by exercising the relevant form of reasoning (a theory of knowledge, of rationality, of action).

These procedures and their results are listed in this order to emphasise that the concepts of action, rationality, knowledge, language and linguistic communication that appear later in the list are superior to those appearing at its beginning, such as discussion, justification, argumentation, etc.

The boundary between formal and informal logic is rather vague, because the domain of informal logic is formal to a certain extent. For it is the type of logic, which constitutes a theory of correct forms of thinking: questioning, defining, classifying, reasoning, arguing, discussing, etc. The difference between formal and informal logic is that the latter does not use formal methods or, if it does, uses them only in a limited way. On the other hand, informal logic is informal in the sense that its approach is practical or pragmatic. In other words, it is logic "with a human face". The goal of informal logic is to make everyday argumentations more logical, that is, more precise and effective.

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[2] The following distinction is worthy of noticing: a knowledge-gaining *procedure* (such as questioning, defining, classifying, etc.) and its *result* (a question, a definition, a classification, etc.). About the distinction: an action – a product (a procedure – a result) see Twardowski 1999, pp. 103–132.

[3] The theories of argumentation and justification are both the theories of knowledge-gaining procedures. But the theory of argumentation is more practical, than the theory of justification, and it focuses on everyday argumentations, their rules and logical fallacies (tricks) employed in such argumentations.

2. Argumentations and Definitions

There is a relationship between argumentation and definition as well as between a theory of argumentation and a theory of definition. A theory of argumentation deals with analysis of the structure (form), roles (functions), and goals of argumentations. It also evaluates whether argumentations are logically correct (valid) or not. A theory of definition similarly concerns the structure, roles, and goals of definitions and their usefulness.

3. Definitions

At least two types of definition theory may be distinguished: (a) a formal theory of definition, which is a part of metalogic (see e.g. Curry 1958; Czelakowski 2009) and (b) an informal theory of definition, which is included in textbooks concerning informal logic (practical logic or critical thinking). In this paper I am mainly interested in the informal analysis of definitions.

3.1. Some Types of Definitions

According to the contemporary, standard theory of definition[4] (see e.g. Robinson 1950; Ajdukiewicz 1958a, pp. 114–126; Ajdukiewicz 1974, pp. 57–84; Ajdukiewicz 1984, pp. 236–256; Jadacki 1995, pp. 139–152; Kamiński 1958a; Marciszewski 1994, pp. 183 ff.; Pawłowski 1980; Ziembiński 1976, pp. 51–66; see also Hansson 2006, pp. 5–30) there are explicit (full) and implicit (partial) definitions (This pertains to the structure of definitions). An *explicit* definition consists of a word being defined (*definiendum*), which occurs on the left side of the definition, and the formula defining the word (*definiens*), which occurs on the right side of that definition. The *definiendum* and *definiens* are connected by a *copula*: an expression such as "is", symbolised by the identity functor with abbreviation "df" ($=_{df}$, $=_{Df}$, $=$ df, $=$ Df) or "if and only if", symbolised by the equivalence functor ($\equiv$, $\leftrightarrow$) in the case, when the *definiendum* is a sentence. An *implicit* definition takes the form of a conditional ("*if* ..., *then* ...", symbolically, $\rightarrow$).

Among other types of definitions, the *ostensive* definition is fundamental. Its practical role is to characterise the meaning of primitive terms

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[4] I do not intend to present all types of definitions. I rather focus on those types which are relevant for the main topic of my paper.

(concepts), which have to be introduced into a language not only by linguistic (verbal) means, but also by a gesture (indication). Janina Kotarbińska explains that "it consists in pointing with a suitable gesture at a single designatum of the term which is being defined and in making at the same time a statement of the type 'This is N', where 'N' stands for the term being defined" (Kotarbińska 1960, p. 2; see also Czeżowski 2000a, pp. 103–109; Marciszewski 1993b, pp. 95–106; Marciszewski 1994, pp. 183 ff.; Marciszewski 1995, pp. 189–190).

The theory of definition distinguishes between real (empirical) and nominal definitions. The role of a *real* definition is to characterise the status of an object (a thing or a phenomenon). A *nominal* definition indicates what a word (name) means or denotes. It should be noted that "the concepts of nominal definition and real definition are by no means mutually exclusive, since there are statements which can be classed as both real and nominal definitions" (Ajdukiewicz 1974, p. 84; see also e.g. Robinson 1950, pp. 24 ff.). It is worthwhile to remember that if, for example, we want to provide a real definition for what human life is (or rationality, freedom, democracy, law, discrimination, etc.), then we use a name such as "human life" ("rationality", "freedom", "democracy", "law", "discrimination", etc.) and formulate a nominal definition which expresses what this word means (denotes).

A definition by *genus* and *differentia* (i.e. an essential definition, which is a kind of form of real definition) indicates what a given class of things[5] (*species*) is in terms of a broader class, the *genus*-class, which includes the defined *species*-class, and a specific (essential, important) property (*differentia specifica*) which only objects of the defined *species*-class have (e.g. Man is a *rational* animal). This property distinguishes the defined *species*-class from other *species*-classes belonging to the same *genus*-class.

A *descriptive* definition gives a description of the class of things defined but does not have a "classical" form (structure) of the definition in terms of *genus* and *differentia*.

A *connotative* definition includes a group of properties (especially essential ones) that belong to the class of things defined. A *denotative* definition fixes the class of things, which belong to the *definiendum* of such a definition.

Stipulative, lexical, and persuasive definitions are also distinguished in the theory of definition. A *stipulative* definition (stipulation) establishes how

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[5] The topic of natural kinds (classes) of things or phenomenon – like e.g. chemical elements, biological species, etc. – is important in contemporary philosophy of language and science (see e.g. Kripke 1981, pp. 106–155; Putnam 1975, pp. 139–152, 192–271).

a new word, which is to be introduced, will be understood (e.g. the term "e-mail" was introduced in such a way). The function of a *precising* definition is to precisify an imprecise (ambiguous and vague[6]) meaning of a word. This type of definition is useful, among other things, in law when one needs to characterise for example what "disabled person" means. A *lexical* definition gives the meaning of a given word as it is used in a language-using society. Dictionaries are full of such definitions.

The purpose of a *persuasive* definition is to promote whichever meaning of a word is thought to be the right or the most useful one (see e.g. Stevenson 1938, pp. 331–350; Stevenson 1944, pp. 206 ff.; Schiappa 1993, pp. 403 ff.; Macagno, Walton 2008a, pp. 203–228; Macagno, Walton 2008b; pp. 525–549). "If a persuasive definition is meant to persuade, and thus has a function as an argument, it could perform this function quite appropriately, provided there is no deception or confusion about what its real purpose is. This formal dialogue model of persuasion throws a new light on persuasive definitions. Viewed within such a model, a persuasive definition is not just a stipulation or fiat" (Walton 2005, p. 179). The intention of a persuasive definition may be misleading or may not (e.g. Walton 2001, pp. 119 ff.; Walton 2005, pp. 164 ff.). It is worth of noting that stipulative and lexical definitions both may be used in a persuasive role.

3.2. Rules of Definitions (Conditions for Correctness of Definitions)

Traditionally, the most important and frequently quoted rules for definitions[7] are the following (see e.g. Ajdukiewicz 1974, pp. 68–70; Ziembiński 1976, pp. 61–64):

a) In the case of an explicit definition, the word defined (*definiendum*) must not be used in the *definiens*. If the rule is not fulfilled, then a fallacy occurs (*"circulus (vitiosus) in definiendo"* – *"idem per idem"*).[8]

b) An unknown word must not be defined by using other words which are also unknown to someone (the fallacy of *"ignotum per ignotum"*).

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[6] An interesting thing is that on the one hand people, who specialise in the theory of definition claim that the role of a precising definition is the precisification of terms which are imprecise, i.e. ambiguous or vague. But on the other hand in the contemporary theory of vagueness definitional strategy is not considered a useful tool to deal with vagueness. The question is whether it is possible to build an agreement between these points of view. If yes, then how? But it is a topic for yet another paper (see e.g. Kublikowski 2003).

[7] Some rules can be already found in the ancient or modern theories of definition, for example in Thomas Hobbes' remarks on definitions (see e.g. Kamiński 1958b, pp. 53–54).

[8] Traditional theory of definition does not allow a definition to be circular. But today some logicians do not acknowledge the circularity of definitions as a fallacy (see e.g. Walton 1985; Gupta 1988–89; Gupta 2008).

c) With regard to a lexical definition the connotation (intension) and denotation (extension) of the *definiendum* and the *definiens* must be identical, i.e. mutually interchangeable (the condition of adequacy). This condition is problematic in the case of real (empirical) definitions. I will try to show this in a subsequent part of this paper.

d) The extensions of the *definiendum* and *definiens* of a lexical definition must not be mutually exclusive.

e) The extension of the *definiens* of a lexical definition must not overlap with the extension of the *definiendum* (see (f) and (g)).

f) The extension of the *definiens* of a lexical definition must not be superior to the extension of the *definiendum* (i.e. the definition must not be too wide).

g) The extension of the *definiens* of a lexical definition must not be inferior to the extension of the *definiendum* (i.e. the definition must not be too narrow).

In this paper I focus on what makes a definition or argumentation *materially correct* (the condition of material or empirical correctness, i.e. the condition of adequacy), rather than on what makes either of these *formally correct* (the condition of formal correctness).

In order to analyse the issue of correctness and incorrectness in argumentation, it is useful to introduce a distinction between explicit and implicit incorrectness (fallacy). *Explicit* incorrectness in argumentation occurs when an argumentation itself is not correct: an example of this form of incorrectness occurs when an invalid scheme of inference is applied so that the conclusion of an argumentation does not follow from the premises of the argumentation. *Implicit* incorrectness occurs when knowledge-gaining procedures and their results (i.e. questioning and questions, defining and definitions, classifying and classification, etc.), applied in argumentation, are not correct.[9]

Argumentations and definitions are interconnected in many different ways. Let us now analyse some of these ways.

4. Argumentation about Definition

Edward Schiappa (1993, p. 404) observes an interesting distinction that is expressed in *The New Rhetoric* written by Chaim Perelman and Lucie

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[9] For some fallacious usages of definitions in argumentations see also e.g. Koszowy 2007.

Olbrechts-Tyteca: "the argumentative character of definitions always presents two closely connected aspects which must nevertheless be distinguished, since they deal with two phases of the reasoning: definitions can be supported or validated by argument; they themselves are arguments" (1969, p. 213). The distinction between argumentation about definition and argumentation from definition has been known since the time of Plato and Aristotle (Weaver 1953, p. 86). An argumentation about definition is designed to arrive at definition, which is useful to further discussion (Schiappa 1993, pp. 403 ff.; Schiappa 2003, pp. 33 ff.; see also McGee 1999, pp. 141 ff.).

I understand argumentation about definition in a similar way to Schiappa. It is a useful enterprise, a procedure in which people seek to formulate a definition of something, for example, a definition of human life. In such cases people try to obtain – by means of argumentation – a specific result: an adequate definition of human life. Such a definition is needed to guide social debate and legal regulations concerning whether abortion involves killing human life or is just a type of surgery, similar to a surgical removal of the vermiform appendix.

In the case of argumentation about definition an argumentative process is finished when a definition is obtained. In other words, a definition is an ending point (a conclusion) of a discussion. In the next case a definition already obtained is a useful tool in a further discourse.

5. Argumentation from Definition

A definition can be the starting point of a discussion. It is good to have a definition of the topic at the beginning of a discussion. The definition delivers the meanings of key words, involved in a discussion, explaining how these words – like "human life", "abortion", "euthanasia" or "human death" – are understood by members of the discussion. This kind of a definition usually is an explicit, nominal definition.

Yet, it is important to remember that the concepts of nominal definition and real definition are not mutually exclusive (see e.g. Ajdukiewicz 1974, p. 84). For in some cases a statement may function as a nominal definition and also as a real definition.

"Standard definitions represent temporary agreements of an audience as to how particular words are to be understood. [...] Well-established and uncontroversial definitions (dormant definitions-as-arguments) are a rhetorical resource that an arguer can draw upon in constructing arguments"

(Schiappa 1993, p. 404; see also Schiappa 2003, p. 169; Walton 2008, pp. 129 ff.; Walton and Macagno 2008, pp. 81 ff.). The problem amounts to finding a definition which is well-established and uncontroversial for users of a language.

An argumentation from definition is similar to an argumentation by definition and it is difficult to distinguish them in a precise way (see e.g. McGee 1999, pp. 141 ff.). However, in the next section I will try to make this distinction clearer.

6. Argumentation by Definition

In my view the most powerful usage of a definition occurs in the case of an argumentation by definition, when a definition plays the role of a premise in an argumentative structure.

A nominal definition – which gives an understanding of a key word for a discussion – may be used in this role (see argumentation from definition). But such a function may also be played by a definition, which has been traditionally called "a real definition". According to the ancient Aristotelian tradition, the goal of a real definition is to establish (discover) essential properties of the class of things which are being defined.

However, despite the fact that the concept of real definition has a long tradition, some scholars – for example Schiappa – have criticised it. The definition of death can be an interesting illustration of his point of view.

6.1. Case Study: Death

For many centuries a person was determined to have died when a physician had examined whether that person's heart and lungs had stopped functioning, that is, whether the person's pulse and the breathing had ceased. A mirror had been a traditional instrument used to look for signs of breathing. If these signs of life were determined absent, then the person in question was certified dead. The technological advancement in medicine (e.g. life-support machinery) made this traditional definition of death problematic (Schiappa 1993, p. 408; see also Schiappa 2003, pp. 35–48). According to the definition later introduced "permanent loss of whole brain functioning *has always been* the underlying criterion of death" (Culver and Gert 1982, p. 187; see also Walton 1980). Schiappa objected that such definitions are traditionally understood, unchangeable real definitions (in other words, traditionally understood, unchangeable real definitions by *genus* and *differentia* or real descriptive definitions, etc.). Ac-

cording to Schiappa, even if we assume that it is possible to obtain real definitions, then such definitions must not be understood as uncontroversial, permanent and unchangeable, but as redefinitions, subject to revision, renegotiation and modification in the context of change in people's perceptions of reality. Rather than counting the presented definitions of death as real, Schiappa would considered these as nominal (lexical, dictionary), stipulative,[10] persuasive, and in some cases, manipulative definitions (Schiappa 1993; Schiappa 2003; see also McGee 1999; Titsworth 1999, pp. 171–184; Walton 2008, pp. 129 ff.; Walton and Macagno 2008, pp. 81 ff.).

I share Schiappa's objections only partially. A criticism of his view may be expressed by the following question: Is it a sufficient reason to disqualify and even abandon the concept of real definition just because so-called real definitions must be revisable and changeable?

Discovering an essential property (a nature) of a class of things does not involve a unique, intuitive act, but a difficult, long-term – perhaps unending – empirical and discursive process. The purpose of this process is to deliver a real definition. But the meaning of a *definiendum* and *definiens* of an obtained definition – as Schiappa also claims – may be revised and changed (corrected). This type of a definition in fact is only approximately, but not totally, adequate[11] (see e.g. Ajdukiewicz 1958b, pp. 29–46; see also Kotarbiński 1966; Putnam 1975, p. 200; Kublikowski 2007). It can be called "a real-hypothetic definition" (Marciszewski 1995, pp. 187 ff.). Let us illustrate this claim by means of a few examples.

6.2. Case Study: Scurvy, Puerperal Fever and Influenza
In fact, the revision and change of a real definition is a standard process in the development of empirical research. In theories, which try to explain the nature (i.e. fundamental properties) of objects of a species, the definition of species is modified to characterise more and more adequately the fundamental properties of the things of a class. For example, some time ago, due to the definition of infectious disease as something caused by communicable micro-organisms, scurvy – which was wide spread among

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[10] According to David Zarefsky argumentation by definition is an argumentation, in which the "key definitional move is simply stipulated, as if it were a natural step along the way of justifying some other claim" (1998, p. 5).

[11] See the rules of correctness of definitions.

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seamen in polar regions – had been considered a highly infectious disease, whereas puerperal fever had been considered a non-infectious disease. However, later this disease, which really satisfied the definition was included into the extension of the term "infectious disease" and that one, which did not satisfied the definition was excluded from that extension (Czeżowski 2000b, pp. 98–99). Some different strategies can be distinguished in this example:

a) If a thing (or phenomenon) does not satisfy an already established definition, then such a thing (or phenomenon) is not considered an element of the extension of the *definiendum*. For example, in the past scientists had supposed that scurvy had been caused by infection. So on the basis of the definition of infectious disease they had considered it to be a highly infectious disease. But when it was discovered that the real cause of this disease was a deficiency of vitamin C, then scurvy was excluded from the extension of "infectious disease". On the other hand, in the past scientists had not known that puerperal fever is caused by infection. So they had not acknowledged this disease as an infectious one. Later they discovered the real cause and agreed that puerperal fever satisfied the definition of infectious disease. In this way puerperal fever came to be included in the extension of the term "infectious disease".

b) On the basis of empirical research the whole definition (*definiens*) can be revised, acknowledged as inadequate (e.g. too narrow) and in effect corrected or completely changed (see the rules of correctness of definitions).

The case of influenza provides an interesting example of such a definitional change (Marciszewski 1994, p. 212; see also Marciszewski 1993a, pp. 169 ff.; Marciszewski 1995, pp. 181 ff.). According to etymology influenza had been defined as the epidemic caused by the influence of heavenly bodies. The meaning of "influenza" had been linked to a naive astrological concept. After the decline of astrology, this primitive, pre-scientific definition of influenza was abandoned for a new definition, which expressed the results of clinical observations: Influenza is "an acute highly contagious infectious virus disease that occurs in endemic, epidemic, or pandemic forms, is characterized by sudden onset, fever, prostration, severe aches and pains, and progressive inflammation of the respiratory mucous membrane" (Webster 1993, p. 1160). When biologists – on the basis of empirical research – discovered that a virus had been the real cause of this disease, they agreed that it would be reasonable to redefine influenza according to the results of their research.

7. Definitions and Their Pragmatic, Persuasive and Manipulative Role

Schiappa claims that:

definitions are human-made, not found; constructed, not discovered. Accordingly the question arguers should be asking is not "What is X?" but rather "How *ought* we use the word X?" or "What should be described by the word X?" Normative questions of this sort cannot be answered acontextually; they virtually compel interlocutors to address the *pragmatic* needs of a given community of language-users located in a particular historical moment. The theoretical phrase "denotative conformity" should not obscure the fact that advocates of new definitions seek to alter the behavior of an audience (Schiappa 1993, p. 413; see also McGee 1999, pp. 141 ff.).

I accept the distinction between "What is X?" and "How *ought* we use the word X?" ("What should be described by the word X?"). Nevertheless, if we understand the expressions "ought"/"should" in a normative way – as Schiappa does (and I agree with him on this point) – and if we realise, that the meaning of the expressions "ought" and "should" is *normative* but not *arbitrary*, then the following problem remains: On what foundation (basis) do we fix the specific definition (description) of the meaning (connotation/denotation) of a word X? Is mere social agreement this unique foundation? I do not think so.

I agree with the claim that definitions may play pragmatic, persuasive, or even manipulative roles. A wider (broader) or a narrower definition may be promoted (see the rules of correctness of definitions) for manipulative purposes. For example, adherents of radical anarchist social systems support a wider and less restrictive definition of human freedom, as the ability to do what s/he wants etc., for political purposes.

But it is important to remember that definitions – real (empirical) definitions – play not only a pragmatic role, but also a syntactic and a *semantic* role. Namely, on the one hand, the *definiendum* of a real (empirical) definition denotes (refers to) the class of things, which are being defined. But on the other hand, the *definiens* continues to be revised in the light of new empirical findings. So, the *definiens* expresses an acquired, realistic, empirical knowledge. Thus, the *definiens* is not just arbitrary constructed by a community of scientists, politicians, etc., as epistemological constructivism may suggest (see Kublikowski 2007, pp. 136 ff.).

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8. Conclusions

The theory of definition is useful for the theory of argumentation, be-cause it helps to distinguish different types of definitions. In addition, the rules of definitional correctness indicate which definitions satisfy conditions and which do not. Such knowledge of definitions allows one to use defini-tions in argumentations in a proper and effective way, as well as to analyse and evaluate the correctness of those argumentations in which definitions are applied. Such knowledge also permits one to detect fallacious definitions and to correct them.

The theory of definition explains how real (empirical) definitions are fallible, revisable, changeable, corrigible, and not totally adequate. But this fact constitutes no evidence for the claim that real definitions are fallacious and that they are simply persuasive, manipulative definitions. It is simply the case that human, realistic, empirical knowledge is fallible, revisable, changeable, and corrigible, and that this phenomenon has to be taken into account in the context of the theory of argumentation when dealing with human argumentative discourse.[12]

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