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Information Seeking Processes in Evaluating Argumentation

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ABSTRACT: This article points out the relevance of the research on information seeking for argumentation theory. The process of evaluating argumentation presupposes diverse principles of argument classification and forms thus conflicting information needs. Following Taylor (1989), we distinguish between *Aristotelian classification* and the *prototype classification*. We show how these classification kinds form the conflicting principles of information seeking providing at the same time a common ground for the dissent information seeking processes in evaluating argumentation.

KEYWORDS: argumentation, categorization, cognitive states, evaluation, information, information needs, information seeking, persuasion, prototype categorization, reasoning

1. COGNITIVE AND CONSTRUCTIVE THEORIES OF INFORMATION NEEDS AND SEEKING

Research on information needs, seeking and use has primarily been focused on analyses of situations when an agent is seeking documents to obtain certain information. That research, however, seems to be relevant for all domains of human knowledge and problem solving situations. Particularly interesting are cognitive and constructive theories of information needs and seeking developed by Dervin (1980, 1983), Dervin and Nilan (1986), Belkin (1980), Belkin, Oddy and Brooks (1982).

Belkin (1980) explains information need as an “anomalous state of knowledge (ASK)”. It arises when there is an anomaly in a user’s cognitive state concerning a topic or a situation. A user realizes that his actual state of knowledge is inadequate for solving a problem and that he needs further information to be able to find out a solution. According to Belkin, the user usually does not know exactly what kind of information is needed for solving the problem; he would otherwise not have been in the situation of information need.

In needing information, the user normally experiences uncertainty, doubt, or suspicion of inadequacy of his state of knowledge, the factors that Belkin, Oddy and Brooks (1982) call “anomalies”. The user therefore initiates a process of problem solving in which a numerous dialogue interactions with other humans, with the physical world and with himself lead, through different communicative patterns, to dynamic and iterative changes in his states of knowledge. Belkin and his colleagues view knowledge as a multi-dimensional structure which, together with the assumption on different kinds of ASK that require different types of solutions, leads to suggesting a plurality of information representations, each appropriate for different types of problems.

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Another cognitive approach to information needs and seeking, combined with analyses of communication behavior, is the sense-making approach developed by Dervin (1980, 1983). Based on empirical research on everyday information needs of average citizens (Atwood and Dervin, 1982), Dervin explains information need situations as those in which an individual's internal sense has "run out" so that the person has to create new sense (Dervin and Nilan 1986, p. 21). The sense-making model explains three dimensions of information need situations, given by the situation-gap-use model:

The sense-maker is stopped in a situation. Movement is prevented by some kind of gap (operationalized for information-need situations as a question or question set). The sense-maker is seen as potentially making some kind of use of whatever bridge is built across the "gap" the user faces (Dervin and Nilan 1986, p. 21).

Similarly to the model of abnormal states of knowledge, the sense-making theory suggests that people are seeking and using information to construct and create new senses that bridge the cognitive gaps or solve different cognitive problems. Consequently, information seeking and use does not consist only in obtaining static answers provided by information systems.

A constructive approach to information seeking processes developed by Kuhlthau (1993) includes not only cognitive patterns of problem solving in information seeking, but interchange between thinking, feeling and acting. Uncertainty and anxiety arising in problem-solving situations initiate the constructive sense-making process of information seeking. Kuhlthau but incorporates in her model analyses of cognitions, feelings and will to show how personal interests, assignment requirements, available information and allotted time influence strategies, expectations and attitudes of the information seeking process (Kuhlthau 1993, pp. 39-43).

2. INFORMATION SEEKING PROCESSES IN EVALUATING ARGUMENTATION

It seems almost obvious that in evaluating argumentation we are involved in a process of information seeking. In evaluating argumentation, we analyze logical relations between the claim advanced and the reasons given to support it. To be able to analyze these logical relations, we need information about pertinent evaluative concepts and procedures.

Some approaches suggest that argumentation consists not only of arguments but also of a numerous persuasive moves. Some authors explain that persuasion messages initiate cognitive states similar to those involved in situations of information need and seeking. Thus, theory of cognitive dissonance (Festinger 1957, 1964; Harmon-Jones 2002; Harmon-Jones and Mills 1999) suggests that sufficient magnitude of inconsistency between cognitive elements (such as beliefs, attitudes, opinions or information) is an unpleasant affective-motivational state. People therefore tend to reduce it by making cognitive and behavioral changes. The tendency to reduce cognitive inconsistency may in different manners be used in persuasive communication. Namely, dissonance processes can in different ways induce attitude, belief and behavior change.

In the similar manner, the psychological reactance theory (Brehm 1966; Brehm and Brehm 1981; Burgoon et al. 2002) proposes that persuasive messages communicate a potential threat to the basic need for freedom and autonomy, since in persuading a person to accept a certain position, the persuader communicates limitations in the freedom of

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choice. Therefore, the process of psychological reactance usually follows upon receiving persuasive messages. Such a reaction is called restoration, demonstrating the audience's efforts to restore the freedom, autonomy and self-control. Restoration may be accompanied by perceptions and feelings of an increased attractiveness of alternatives to the persuasive message. These perceptions and feelings may stimulate a negative evaluation of the message, searching for information to confirm the alternatives, and aggressiveness towards the persuader.

If then evaluation of argumentation may be described as an information seeking process, it follows that this kind of problem solving involves cognitive and affectionate states described in the cognitive theories of information need and seeking. In seeking adequate information to bridge the cognitive gap arising when solving the problem of argument evaluation, the person may use different information systems of pertinent evaluative concepts and procedures. Since the information user does not in advance know the solution for the given problem, there might be different sense-making solutions for the information need in the situations of evaluating argumentation.

Each of different systems of concepts and procedures for evaluating argumentation suggests a specific categorization of evaluative concepts and guides thus the related information seeking processes in different directions. At the same time, information seeking in one of these systems initiates information needs unlike those arising as a consequence of information seeking in another system of evaluative concepts.

3. ARISTOTELIAN CATEGORIZATION AND THE IDEAL OF VALIDITY

Traditionally, the concept of validity has been the concept for argument evaluation and has formed an ideal of a good argument. Accordingly, a good argument is the one in which the conclusion is logically entailed in the premises. In other words, the one in which the conclusion necessarily follows from the premises. If, moreover, the premises are actually true, the valid argument guarantees the truth of the conclusion and we evaluate it as sound.

The concepts of valid and sound arguments originated in Aristotle's theory of syllogism (Aristotle 1928). Aristotle defines syllogism in the following way:

A syllogism is discourse in which, certain things being stated, something other than what is stated follows of necessity from their being so. I mean by the last phrase that they produce the consequence, and by this, that no further term is required from without in order to make the consequence necessary (Aristotle 1928, 24b 20)

I call that a perfect syllogism which needs nothing other than what has been stated to make plain what necessarily follows; a syllogism is imperfect, if it needs either one or more propositions, which are indeed the necessary consequences of the terms set down, but have not been expressly stated as premisses (Aristotle 1928; 24b 25).

Whenever three terms are so related to one another that the last is contained in the middle as in a whole, and the middle is either contained in, or excluded from, the first as in or from a whole, the extremes must be related by a perfect syllogism (Aristotle 1928; 25b 32).

In taking good arguments to be the same as valid arguments, standard contemporary definitions assume two features of Aristotelian syllogism:

- (1) the relation of logical consequence between the premises and the conclusion;
- (2) a decisive evaluative procedure of specifying necessary and sufficient conditions for different forms of valid arguments.

In theories of dialogue logic (Krabbe and Barth 1982; Krabbe 1985a, 1985b, 1986, 1992; Hintikka and Saarinen 1979) and in pragma-dialectical theory of argumentation (van Eemeren and Grootendorst 1992; van Eemeren and Houtlosser 2003), the concept of validity is still the main principle of evaluating argumentation. Even if procedural rules of dialogue interaction are devised, the dialogue moves regulate a procedure that solves conflicts of opinion by means of valid arguments.

Another concept of argument evaluation is the concept of inductive argument. In tolerating that all good arguments can be classified into these two groups, standard theories assume Aristotle's claim that every belief is a result either of deduction or of induction:

We must now state that not only dialectical and demonstrative syllogisms are formed by means of the aforesaid figures, but also rhetorical syllogisms and in general any form of persuasion, however it may be presented. For every belief comes either through syllogism or from induction (Aristotle 1928, 68b13).

The features of inductive reasoning that distinguish it from demonstration can still be traced back to Aristotelian definition of induction:

Now induction, or rather the syllogism which springs out of induction, consists in establishing syllogistically a relation between one extreme and the middle by means of the other extreme, e.g. if B is the middle term between A and C, it consists in proving through C that A belongs to B. [...] For example let A stand for long-lived, B for bileless, and C for the particular long-lived animals, e.g. man, horse, mule. A then belongs to the whole of C: for whatever is bileless is long-lived. But B also ('not possessing bile') belongs to all C. If then C is convertible with B, and the middle term is not wider in extension, it is necessary that A should belong to B. [...] But we must apprehend C as made up of all the particulars. For induction proceeds through an enumeration of all the cases (Aristotle 1928, 68b15).

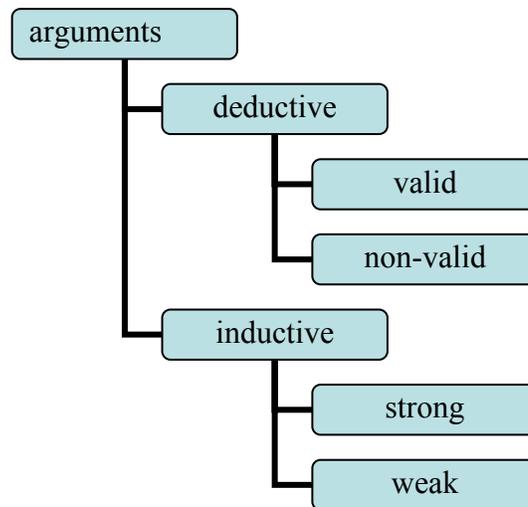
The standard categorization of concepts for evaluating argumentation assumes thus Aristotelian categorization of these concepts and its three distinctive features:

- (1) Distinction between deductively valid (syllogism based on demonstration) and inductively strong (syllogism that springs out of induction) arguments as the only two kinds of good arguments;
- (2) Definition of necessary and sufficient conditions for determining if an argument is deductively valid or not and for determining if an argument is inductively strong or not - neither deductive validity nor inductive strength can be a matter of degree;
- (3) Idea that every argument belongs only to one of the defined categories (it can be thus categorized as either deductive or inductive, either valid or non-valid, either inductively strong or inductively weak); the distinction between the categories is clear and there cannot be indecisive cases.

4. THE RELATION BETWEEN DEDUCTIVELY VALID AND INDUCTIVELY STRONG ARGUMENTS

In argumentation theory, we find two interpretations of the relation between deductively valid and inductively strong arguments. One of them suggests that deductive and inductive arguments are two different kinds of argumentation. Such an interpretation corresponds to the principles of Aristotelian categorization that defines syllogism as the most general term for categorizing reasoning. Demonstration and induction are different sorts of syllogism (Aristotle 1928, 25b28). It would therefore be meaningless to compare the strength of a deductively valid argument with the strength of an inductively strong argument. The following figure would illustrate that interpretation:

Figure 1

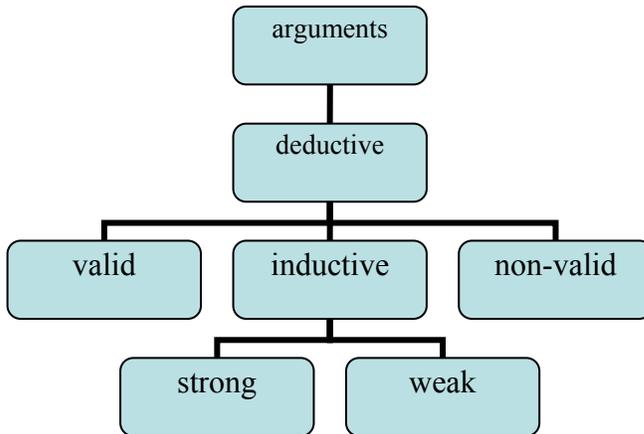


According to another interpretation, inductive arguments may in principle be subsumed into the category of deductive arguments. If we take that probabilistic theories provide decision procedures for classifying an inductive argument as inductively strong or inductively weak, and follow the rule that inductively strong arguments are those in which the conditional probability of the conclusion relative to the set of premises is greater than one half, but less than 1, deductive arguments may be interpreted as inductive arguments in which the conditional probability of the conclusion relative to the set of premises equals 1. Consequently, it may be claimed that the conclusion of inductively strong arguments does not necessarily follow from the premises (the conditional probability of the conclusion relative to the premises is less than 1) but still follows in a certain degree (the conditional probability is more than one half and less than 1). It is therefore meaningful to compare the strength of a deductively valid argument with the strength of an inductively strong argument, and deductively valid arguments are thus the strongest arguments. This interpretation of the relation between deductive and inductive arguments assumes that:

- (1) In principle, all arguments can, by adding additional premises, be reconstructed as deductive arguments;
- (2) The category of deductive arguments is a super ordinate category for the other kinds of arguments;
- (3) Deductively valid arguments are the strongest arguments.

The figure of “two axes of categorization” (Taylor 1989) represents categorization of arguments as approached in the second interpretation.

Figure 2



Even if Taylor does not apply the figure to analyze categorization of arguments, the figure is suitable for analyzing that domain. Following Taylor (1989, p. 46), we see that the two axes of categorization provide two simultaneous levels of argument categorization. The vertical axis includes category of *inductive arguments* in the higher category of *deductive arguments*, which is on its side included in the next higher category of *arguments*. The horizontal axis illustrates the distribution into contrasting categories which are all included in the next higher category. The horizontal axes categorizes deductive arguments into either deductively valid or deductively non-valid arguments, but includes also inductive arguments as those which are different from both deductively valid and deductively non-valid arguments but may be seen as arguments which are deductively valid in a certain degree.

In accordance with Taylor, (1989, p. 47), we see that the second interpretation of the relation between deductive and inductive arguments and the figure representing the two axes of categorization involve some elements of Aristotelian, hierarchical categorization. Each lower category on the vertical axes is assumed to possess the distinctive features of the super ordinate category (in the case of arguments, a given argumentative schema), but possesses also some other features that distinguish it from the super ordinate category. The categories on the horizontal axes all share the features common to the super ordinate category but each of them possesses features that distinguish it from the other categories at the same horizontal level.

Thus, the schematic representation of the two axes of categorization presupposes the main assumptions of the Aristotelian categorization (see Taylor 1989, pp. 21-37):

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- (1) Different categories are often clearly distinguished from each other (by distinctive features they possess), that is, categories have clear boundaries;
- (2) An entity either possesses or does not possess the distinguished features, that is it either belongs or does not belong to a given category;
- (3) All members of a given category share the distinguished features of the category.

5. PLAUSIBLE ARGUMENTS AND RATIONALLY PERSUASIVE ARGUMENTS

Following Rescher (1976), Walton (1987, 1997) has rightly argued that beside deductive and inductive arguments, there are also plausible arguments and it is meaningless to reconstruct them as either deductive or inductive arguments. In many professional and everyday life situations, we rely on plausible arguments, even if their conclusions do not follow from the premises either necessarily or with a large enough conditional probability. In plausible arguments we simply have some good reasons to rely on the premises. These good reasons are however various in their kind, and support the advanced claims in various degrees of strength. There are, moreover, no strictly defined necessary and sufficient conditions for decisively deciding if the premises support the conclusion in a plausible argument.

For instance, arguments relying on expert opinion, *ad hominem* arguments and arguments based on analogy are grounded in plausible reasoning. According to Walton's theoretical frame, each kind of plausible arguments suggests a specific argumentation schema, and a group of critical questions that, given the pertinent dialogue procedure, may operate as tools for providing information in evaluating the arguments. Walton suggests the following scheme for arguments based on expert opinion:

- (1) E is a genuine expert in S
- (2) E asserts that A.
- (3) A is within S.
- (4) A is consistent with what other experts say.
- (5) A is consistent with available objective evidence (if any is known).
- (6) Therefore, A can be accepted as a plausible assumption. (Walton, 1997, pp. 223-225)

In combining Krabbe and Walton (1994) with Brinton (1985, 1995), we may suggest a preliminary scheme for a plausible situationally disqualifying *ad hominem* argument:

- (1) A asserts p.
- (2) B challenges A's asserting p, because A is situation s.
- (3) Situation s is ethotically relevant for A's asserting p.
- (4) It is true that A is in situation s.
- (5) Therefore, it is plausible to challenge p.

The following schema may be suitable for a plausible argument based on analogy:

- (1) X and Y are similar to each other in regard to property p.
- (2) X has property q.
- (3) Having property p is relevant for having property q.
- (4) Differences between X and Y do not affect the relevant similarities between X and Y.
- (5) Therefore, it is plausible to assume that Y has property q.

In theories on critical thinking, we find still other concepts for argument evaluation. Bowel and Kemp (2005) write about arguments that are rationally persuasive for a person. According to these authors, inductively strong arguments may still be defeated, being thus rationally unpersuasive, for a person at a given time. We would like to add that the same holds for plausibly strong arguments. The procedure of defeating an inductively or plausibly strong argument corresponds to the principles of active criticism, discussed in Krabbe (1999, p. 10). Consider the following argument:

Argument 1

- (P1) 70% of Russian people are orthodox.
- (P2) Oleg is Russian.
- (C1) Therefore, (probably) Oleg is orthodox.

Now, assume that all Paul knows about Russian people and Oleg at a given point of time is the information given in P1 and P2. According to Paul's information state at the given time (t1), the inductively strong argument from P1 and P2 to C1 is reasonably persuasive. Would it be still possible to question C1 in such an argument? Suppose that Olof is in a different information state at t1. Olof reasonably accepts information given in P1 and P2 but has additional information and knows that:

- (P1') Oleg is a Russian communist;
- (P2') No Russian communist is a believer; and
- (P3') All orthodox are believers.

Then, even if Olof reasonably accepts the premises of the given argument at t1, he reasonably defeats the argument, by means of active criticism grounded in (P1')-(P3') and concludes that (C1') Oleg is not orthodox. In that case, we say that Argument 1 is reasonably unpersuasive for Olof, even if it is reasonably persuasive for Paul. Now, if after Olof's defeating of Argument 1 (thus, at another point of time, t2), Paul's information state has changed (since he now also has information P1' - P3', we would say that Argument 1 is reasonably persuasive for Paul at t1, but is reasonably unpersuasive for Paul at t2.

Similar examples may easily be found for plausibly strong but reasonably unpersuasive arguments. Following Bowel and Kemp (2005, p. 229), we say that an argument is rationally persuasive for a person at a given time when:

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- (i) the argument is either deductively valid or inductively strong or plausibly strong;
- (ii) the person reasonably believes the argument's premises (at a given time); and
- (iii) it is not an inductively strong or plausibly strong argument that is defeated for that person (at the time).

In specifying condition (iii), we follow Bowel and Kemp (2005, p. 229) and Krabbe (1999, p. 10) to clarify that an inductively or plausibly strong argument is defeated for a person at a given time when the person reasonably believes the premises, but still reasonably rejects the conclusion, by means of additional information expressed through active criticism.

6. PERSUASIVE ARGUMENTS AND FALLACIES

There are still other types of arguments that some authors (e.g. Bowell and Kemp 2005) call persuasive arguments. These arguments are not deductively valid, nor inductively or plausibly strong, nor reasonably persuasive, but they actually persuade people. Studies on persuasion (see e.g. Dillard and Pfau 2002; O'Keefe 1999) have provided remarkable analyses of the factors that influence persuasiveness of argumentation. These factors are not based on explicit reasons given to support the claims advanced in arguments, but on different stimuli that appeal to attitudes, beliefs, norms, personal characteristics, cognitive, affective or volition states and attitude functions of a person. The authors of persuasion theories would therefore not call these stimuli persuasive *arguments* (as Bowell and Kemp do). Persuasive appeals are rather combined with arguments in argumentative activities. One may also find views that the use of arguments is only one of the various persuasive techniques.

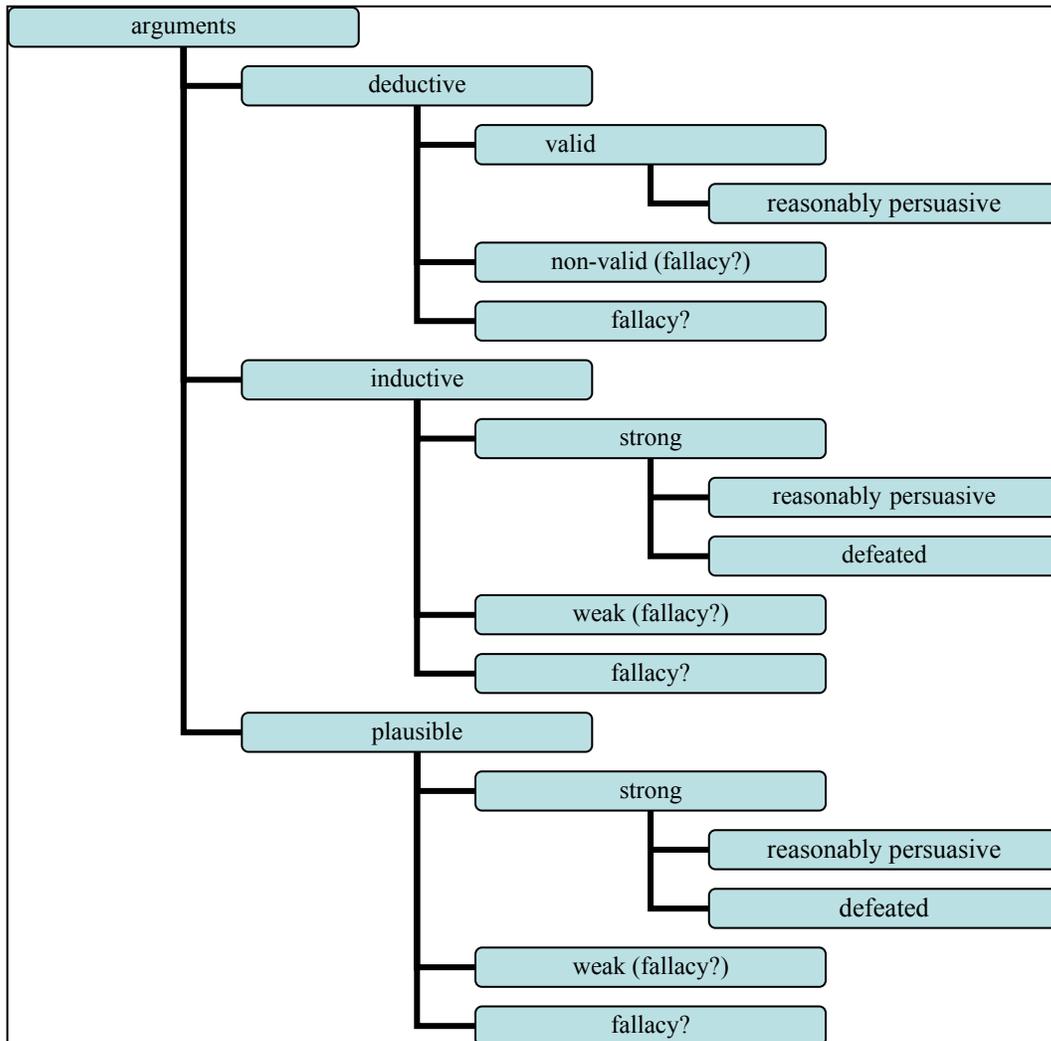
An analysis of argumentative strategies as a combination of the reasoning aspects and the persuasive aspects of argumentation is developed in Jovičić 2004, 2006. Categorization of argumentative strategies by means of the corresponding evaluative concepts would introduce another possibility for categorizing arguments. We will later briefly discuss that type of categorization.

An additional concept for argument evaluation is the concept of fallacies. During the last five decades, authors working on fallacy theory have encountered difficulties in defining the phenomenon as a clearly distinguished category. One explanation of the difficulties might be the fact that the very techniques of sophisticated refutations are various and varying and have fuzzy boundaries. There is no a distinctive feature for all different forms of sophisticated refutations, except maybe the one that characterizes fallacies as refutation that seem to be grounded in good arguments but is actually not. The reasons why fallacies are not good arguments are, however, diverse. In some cases, fallacies are grounded in wrongly constructed arguments that seem to have logically proper (valid) form (e.g. *affirming the consequent*, *denying the antecedent*); in other cases they even have a form of a valid argument (e.g. *false dilemma*, *begging the question*); in still other cases, fallacies are the wrong ways of using arguments (e. g. definition of *ad verecundiam* in Walton, 1997 or definition of *ad hominem* in Krabbe and Walton, 1994).

Moreover, we cannot always say that certain argument schemes (for instance, *ad hominem*, or arguments based on expert opinion), either belong or do not belong to the

category of fallacies. Neither can we provide a general definition of fallacies as the wrong ways of using arguments. Contrary to definitions of fallacies as blocking dialogue moves (Walton 1997 and van Eemeren and Grootendorst 1992), in some situations and in regard to some participants in a dialogue, it may be reasonable to use the blocking dialogue moves. The category of fallacies may therefore be subsumed under several categories for evaluating argumentation (see figures 3 and 4).

Figure 3



7. DIFFERENT KINDS OF ARGUMENTS OR HIERARCHY OF ARGUMENTATIVE STRENGTH?

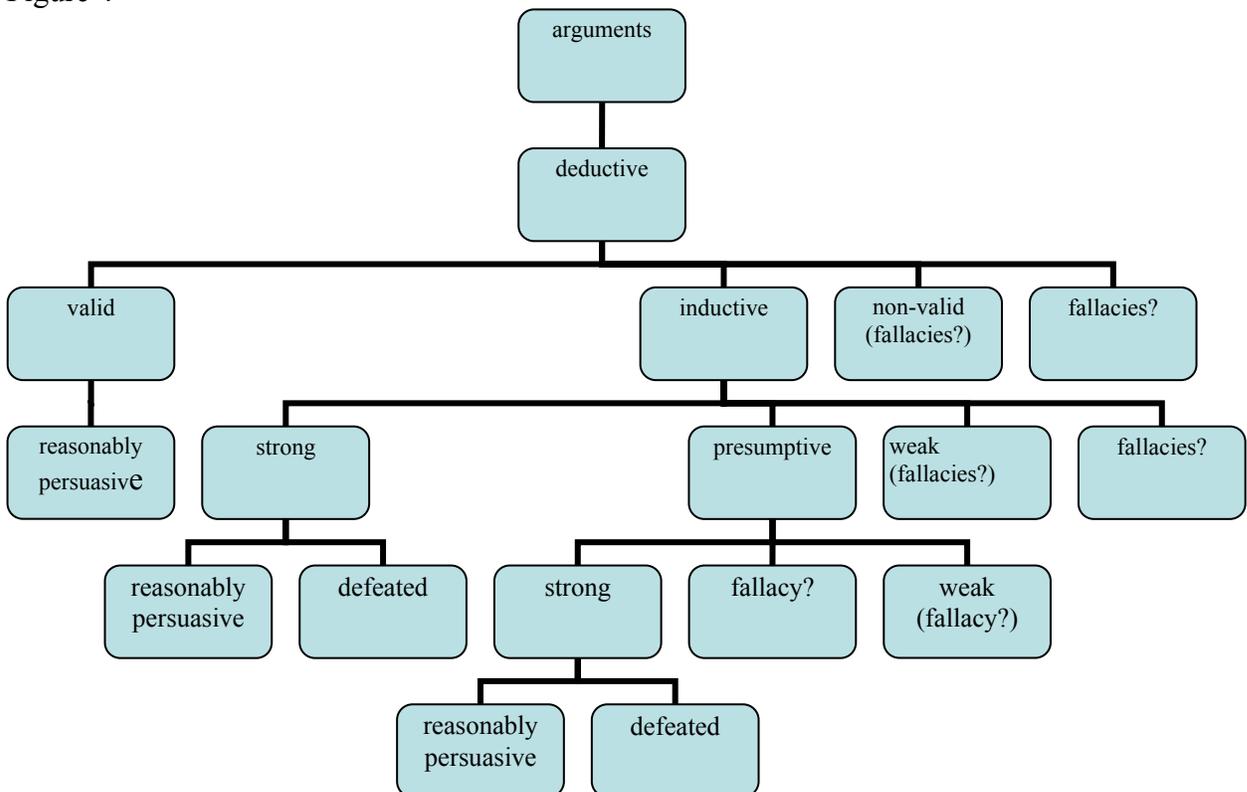
As we have already pointed out, two interpretations of the relation between different kinds of arguments (and thus different concepts for argument evaluation) have been advanced. One of them suggests that these different kinds of arguments cannot be compared with each other, since they correspond to different ways of reasoning that are incomparable with each other. Likewise, it would be meaningless to compare the strength of a deductively valid argument with the strength of an inductively or a plausibly strong argument. Walton (1987, 1997) seems to advance such an approach. Figure 3 illustrates the categorization of the discussed concepts for argument evaluation, according to that approach.

The other interpretation would suggest that the different kinds of arguments and consequently different concepts for evaluating arguments are hierarchically ordered in two ways:

- (1) dialectically valid arguments are the strongest (or the best kind of) arguments;
- (2) the form of deductive arguments is such that all the other kinds of arguments may in principle be reconstructed as deductive arguments.

Figure 4 illustrates the categorization of the discussed concepts of argument evaluation according to this view.

Figure 4



8. PROTOTYPE CATEGORIZATION

The discussed ways of structuring concepts for argument evaluation have suggested that the classical categorization is not always proper for explaining the relation of these concepts to each other. Several assumptions of the classical theory do not hold. For instance, *the assumption that all members of a category have equal status* is obviously questionable in regard to the category of deductively non-valid, inductively weak and plausibly weak arguments. Some deductively non-valid arguments, but not all, would be fallacies; likewise, some inductively or plausibly weak arguments, but not all, would be fallacies. Moreover, *the assumption that there is a fixed set of necessary and sufficient conditions* defining membership to each category is not sustainable regarding the concept of fallacy. We define fallacy by using different criteria (as weak or bad arguments or as bad ways of using arguments) and in regard to different types of arguments. The categorization of the concept of fallacy, as well as of some plausible and reasonably persuasive arguments, shows that *the assumption that category boundaries are fixed* does not hold either. For instance, fallacies belong to several categories, some plausible arguments could be reconstructed as inductive, and reasonably persuasive arguments may be subsumed under the categories of deductively valid, inductively strong or plausibly strong arguments.

In relying on empirical research on the ways in which people construct categories in their language use (Rosch 1975), Taylor (1989) suggests the prototype categorization (Clark and Kay 1981; Geeraerts 1985, 1989; Rosch 1975, 1976, 1978) as a solution to these difficulties of the classical categorization theory. According to Taylor (1989, p. 59), the term ‘prototype’ may be understood as a schematic representation of the conceptual core of a category. Several features characterize of the prototype categorization:

- (1) The prototype theory suggests that entities belong to a category not due to well defined necessary and sufficient conditions defining the category, but rather due to similarity that entities have with the prototype. Since similarity is a graded concept, the category membership is also graded. An entity may belong to a category in a higher or a lower degree. Moreover, the concept of similarity makes category assignment and distribution relative to the language users who categorize. According to Taylor (1989, p. 60), “[t]hings are similar to the extent that a human being, in some context and for some purpose, chooses to regard them as similar”, relative to her beliefs, interests and past experience.
- (2) Prototype categorization assumes the distinction between core definition of a category and recognition procedures. The core definition describes the essence of a category and corresponds thus to a definition of necessary and sufficient conditions for the category. While the classical theory of categorization relies only on the core definition principles, prototype theory includes the identification or recognition procedure that according to Taylor (1989, p. 69) may rely on characteristics which are accidental to an entities real essence. Taylor thus suggests that the core definition considers abstract linguistic features of a category and constitutes its linguistic meaning. Prototype effects relate identification procedure to the core definition and arise thus from “an interaction of core

meaning with non-linguistic factors like perception and world knowledge, and can thus be assigned to other components of the mind” (Taylor 1989, p. 70).

- (3) Taylor (1989, p. 72) relates the distinction between core definition and recognition procedure to distinction between ‘expert categories’ and ‘natural categories’. Whereas expert categories are defined by means of specifying necessary and sufficient conditions for belonging to a category, natural categories are specified around prototypical instances obtained through everyday language use. For instance the concept of valid argument is an example of an expert category, while the concept of plausible argument arises from the use of the term ‘argument’ in everyday language use. Taylor (1989, p. 73) follows Putnam (1975) in proposing that

[A]t least some words in our vocabulary are subject to both expert and folk definitions, the former having to do with necessary and sufficient conditions for category membership, the latter relying on our knowledge of perceptual and interactional attributes of prototypical instances”.

- (4) Prototype categorization specifies the linguistic resources that enable expressing the degree of category membership. Lakoff (1972) calls these linguistic resources *hedges*. The non-exhaustive group of hedges includes sentence adjuncts like *loosely speaking* and *strictly speaking*, conjunctions like *in that*, modifiers like *so-called*, and even graphological devices like inverted commas, as well as certain intonation patterns (Taylor 1989, p. 76).

Taylor (1989, pp. 76-79) analyses the ways in which some of the hedges discussed in Lakoff (1972) structure entities into categories. The hedge *par excellence* is thus used to specify central members of a category, as when we are saying that *Modus Ponens* is a scheme of a valid deductive argument *par excellence*. Contrary to that, the hedge *loosely speaking* excludes the central members of a category, as when we say that loosely speaking, denying the antecedent may be a scheme of a good deductive argument. *Strictly speaking*, on the other side, excludes non-prototypical members of a category, as in saying that strictly speaking, only deductive arguments may be valid arguments. When we say that loosely speaking, denying the antecedent is a scheme of a good argument *in that* there are valid instances of that argument scheme, we use hedge *in that* to specify the reasons for including the entity in the category.

According to Taylor, hedges provide the evidence for the prototype categorization from within the language:

Hedges require us to distinguish between central and peripheral members of a category (*par excellence*, *strictly speaking*), as well as between different degrees of non-membership in a category (*strictly speaking*). They show that category boundaries are flexible (*loosely speaking*), and that categories can be redefined by an *ad hoc* selection and re-weighting of attributes (*in that*). Furthermore, hedges can pick out cases where, exceptionally, categories *are* being defined by classical principles (*technically*), although in doing so they at the same time imply a contrast with non-classical categorization (Taylor 1989, p. 80).

9. SEEKING INFORMATION TO EVALUATE ARGUMENTATION

Someone who attempts to evaluate an argument or argumentation finds himself in an “anomalous state of knowledge” in which the information necessary for evaluating argumentation is missing. The person initiates a process of constructing a new cognitive situation in which, on the basis of the information obtained, the evaluation would be possible. Various information systems, grounded in different types of conceptual categorization, initiate different information needs and lead to different processes of information seeking.

The structures of categories for argument evaluation may be considered as such information systems. Different categorization systems would provide the user with different information regarding the available evaluative concepts and the principles of applying them. They would thus structure the analyses of argumentation processes in different ways. The different information systems would accordingly influence the user’s information needs and would lead the user into different information seeking practices.

The system of categorization given on Figure 1 would initiate information needs and the information seeking processes that would tend to reduce argumentation either to deductive or inductive arguments. Categorization principles given on Figure 3 would initiate information needs that would invite a person into a more complex information seeking process. Both sets of assumptions though still assume the principles of classical categorization that assume a perfect correlation between the defined attributes of a given category and the category’s members.

The users of such conceptual systems are methodologically trained to reduce the perception of argumentation phenomena only to those dimensions that correspond to these systems. They are moreover trained in accepting only the information needs suitable for information seeking processes allowed by the systems. An advantage of prototype categorization would be that it leads to the information seeking processes that rely on more diverge dimensions of argumentative practices. It therefore stimulates development of information needs corresponding to complexity of argumentative activities. Prototype theory can at the same time stimulate information needs information seeking processes suitable for the principles of classical categorization:

In a sense, prototype categories give us the best of both worlds. The central members of a prototype category do share a large number of attributes [...] – in this respect, the centre of a prototype category approaches the ideal of a classical category. At the same time, prototype categories permit membership to entities which share only few attributes with the more central members. In this respect, prototype categories achieve the flexibility required by an ever-changing environment (Taylor 1989, p. 54).

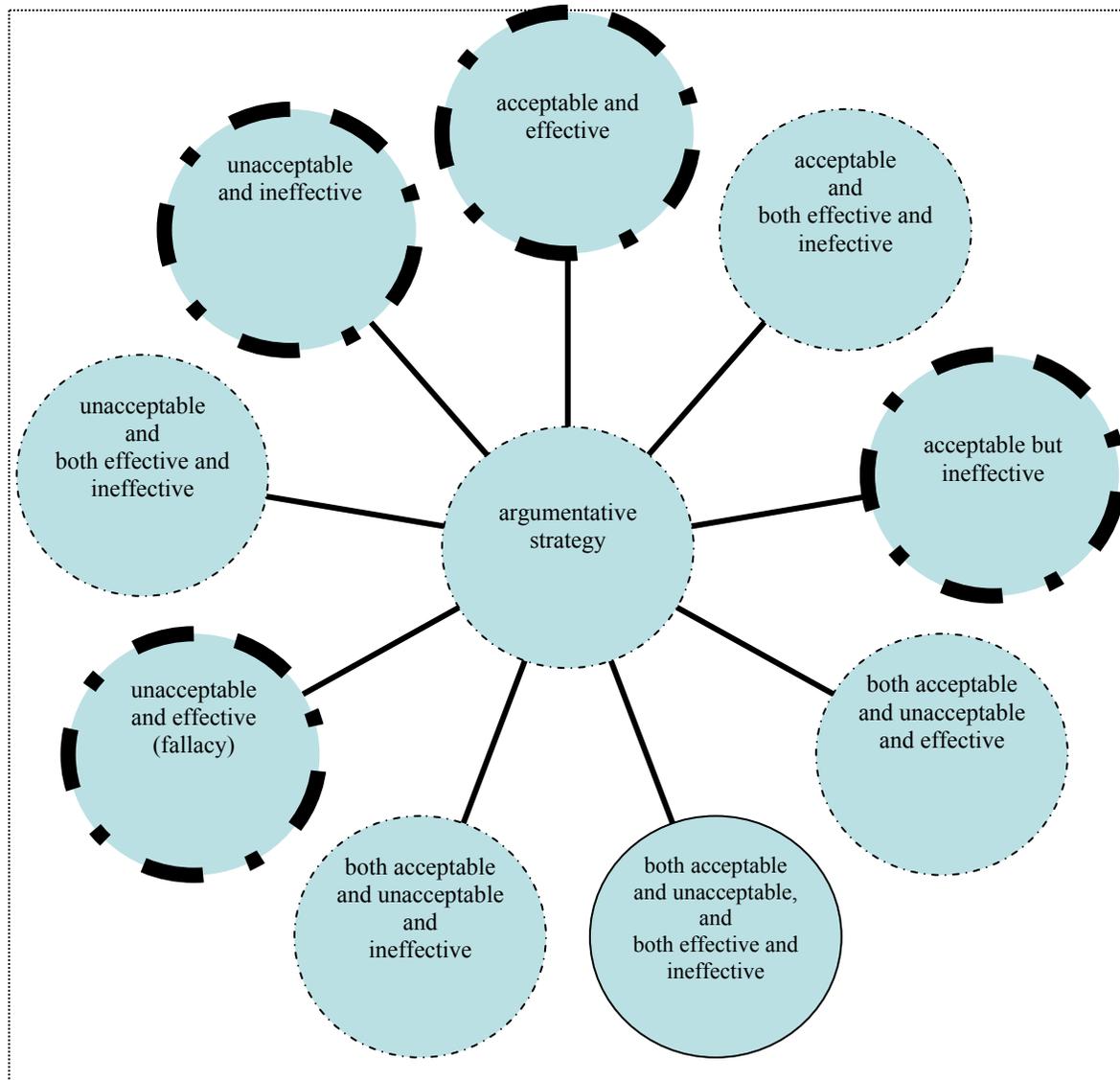
In Jovičić, 2004 and 2006, concepts for evaluating argumentative strategies as a combination of the reasoning aspects and the persuasive aspects of an argumentative activity have been advanced. The dimension of acceptability evaluates the various logical relations between the claims advanced in argumentation and the reasons given to support them. For instance, in Jovičić 2004, principles for analyzing acceptability of arguments based on authority are suggested. However, the category of acceptability is suitable for comprising all the evaluative concepts discussed in other categorization systems (e.g. deductively valid, inductively strong, presumptively strong or reasonably persuasive reasoning).

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The dimension of effectiveness evaluates persuasive strength of an argumentative strategy. An analysis of the effectiveness and of the principles of its evaluation is provided in Jovičić 2006. The analysis suggests that an argumentative strategy is effective if it appeals to relevant characteristics of an audience by communicative stimuli or message effects that initiate such cognitive responses in the audience as make the claims advanced in the argumentative strategy attractive to it. In analyzing the relevant personal characteristics, communicative stimuli and message effects as the constitutive elements of the effectiveness of an argumentative strategy, Jovičić 2006 relies on the results of the various theories of persuasion and social psychology.

Different combinations of the concepts of the acceptability and the effectiveness provide thus several core categories for evaluating an argumentative strategy. Figure 5 illustrates that type of categorization.

Figure 5



In evaluating argumentative strategies as a combination of the reasoning and the persuasive aspects, we do not assume that the evaluative categories are clearly distinguished from each other. Both acceptability and effectiveness are explained as graded concepts that also allow indecisive cases. For instance, the reasoning may be acceptable (in a certain degree), both acceptable and unacceptable (indecisive), or unacceptable (in a certain degree). The same holds for the dimension of effectiveness. For elaborate analyses of the principles of evaluation, see Jovičić 2004, 2006. Thus, the corresponding combinations of the evaluative concepts do not presuppose that an entity either possesses or does not possess the distinguished features. Moreover, evaluation of argumentative strategies assumes core definitions of evaluative concepts but relies on identification procedures based on non-definitional aspects of perception and world knowledge. Therefore the categorization of the concepts for evaluating argumentative strategies has some similarities with the prototype categorization. Surprisingly, though, the category of fallacy obtains a well defined space in the evaluative domain and is explained as unacceptable but effective, that is, manipulative argumentative strategies.

Maybe all these different ways of categorizing concepts and procedures of evaluating argumentation delineate a common dynamic information structure. In initiating diverse information needs and in leading towards different information seeking procedures that provide changeable structures for the process of making sense of the varying cognitive, affective and volitional situations, the plurality of the systems of evaluative categories revive the complexity and the beauty of human argumentative activities.

[link to commentary](#)

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