ISSA Proceedings 2006 – A Defeasible Pragma-Dialectical Model Of Argumentation

1. *Introduction*

What's an argument? According to Daniel J. O'Keefe (1977), there are two types of argument. Argument1 is an argument characterized as "a kind of utterance or a kind of communicative act". It can be thought of as a claim and its reason. Argument2 is described as "a particular kind of interaction" and denotes the process of arguing, or the act of making arguments for a certain claim. In other words, argument1 means argument-as-product while argument2 denotes argument-as-process (Reed & Walton, 2003). Habermas (1984) called the former "argument" and the latter "argumentation". However, in the first half of 20th century, the structure (or form) of arguments had mainly been idealized, i.e., mathematical proofs had been taken as paradigm of successful argument. An argument was entirely abstracted away from the daily context. Most people focused on argument1 (argument-as-product) while neglected argument2 (argument-as-process). In the framework of argumentation evaluation based on classical or traditional logic, therefore, an argument is treated as static, context-insensitive, no goal-oriented, and zero-agent (van Benthem, 2003). Whereas, generally speaking, the basic characters of argument in everyday life is dynamic, context-sensitive, goal-oriented, and multi-agent.

Beginning in 1940s, as a matter of fact, many philosophers such as Strawson, Austin, Searle et al. focused on the pragmatic elements in assessing arguments. Toulmin (1958) presents a dialectical model, which is called Toulmin Model, differing from the CM in trying to describe the structure of argument as process. Toulmin has pointed out that formal logic lacks adaptability to different fields, but arguments can only be understood in a context. However, it is a pity that their works had little bearing on the formal semantic developed by Richard Montague and his followers. It was not until the rise of Informal Logic (in North America), Pragma-Dialectics (in Holland), and Radical Argumentativism (in France), that argumentation theorists or (informal) logicians paid attention to the importance of pragmatic elements such as context again. It is apparent that we cannot deal with

the above character of argumentation with the classical model of argument evaluation. Therefore, another logical model is needed to evaluate a real argument.

2. *Classical Model and Its Limitations*

The model of argument evaluation based on classical logic is called the Classical Model (CM). This model, which is based on deductive validity, usually consists of at least two calculus systems: the one for propositional one and the other for predicate one, where the essential rule is,

R1 [Modus Ponens (MP)]
$p \rightarrow q,\ p \vdash q$

It means that if p then q, p, therefore, q. MP consists of three statements. The first statement is the "if-then" or *conditional* statement, namely that p implies q. The second statement is that p, the *antecedent* of the conditional statement is true. Following those two statements, it can be logically concluded that q, the *consequent* of the conditional sentence, must be true as well.

In order to grasp the CM, let us start with analyzing a classical example presented by Wilson (cf., Walton, 1989, p.2).

Example 1

A seaman drafted to our ship just before we sailed from Halifax had never seen his new captain, who at sea often went hatless and wore a nondescript jacket. The new man had just begun a forenoon watch on the gun deck when the captain came along. The skipper suddenly stooped and picked up a butted cigarette. He thrust the butt at the seaman and demanded: "I want to know who the hell owns this damned thing." The new hand considered for a moment, then said slowly to the rankles, hatless officer: "I'd say you do, mate. You found it."

According to the CM, the seaman's argument form is a MP rule with Universal Quantifier.

$(x)(Ax \rightarrow Bx)$
Aa
$\therefore Ba$

In this case, the first premise is unexpressed. Intuitively, the argument is valid in the following generic sense:

D1 (Semantic Validity)
An argument is semantically valid if and only if no interpretation makes premises all true and conclusion false

According to Belnap (2002), this is called semantic validity because D1 shows that no interpretation is a counterexample of the argument. However, what makes a valid argument valid? What is the ground of the impossibility of the premises being true and the conclusion false? One answer is that the source of validity is narrowly logical or purely syntactic: the validity of a valid argument derives from its subsumability under logical laws or (what comes to the same thing) its instantiation of valid argument-forms. We now definite a second, specific sense, of 'valid'; one that alludes to the source of validity:

D2 (Syntactic Validity)
An argument is syntactically valid if and only if the conclusion can be derived from the premises (including an axiom or) by means of MP.

According to D2, a valid argument inherits its validity from the validity of its form, or logical syntax. So on D2 it is primarily argument-forms that are valid or invalid; arguments are valid or invalid only by virtue of their instantiation of valid or invalid argument-forms. Belnap (2002) called this proof-theoretical validity meaning that an argument is valid by some rules, i.e., there is a proof leading from premises to conclusion. In a word, deductive validity is the criterion of allowing formal derivation meaning that an argument is valid if and only if it is a substitution instance of a formally valid argument form which is such that it cannot be the case that true premises lead to a false conclusion. After we distinguish the above two kinds of validity, we can define the deductive validity.

D3 (Deductive Validity)
An argument is deductively valid if and only if it is semantically and syntactically valid.

However, the deductive validity does not say that the premises are actually true. An argument is valid, supposing the premises are true, the conclusion follows. In actuality the premises might be false. Consider an example of a valid argument with actually false premises:

Example 2
All dogs have eight legs.

The President is a dog.
Therefore, the President has eight legs.

The argument above is perfectly valid when the truth of the premises is assumed. It is not necessarily true that a valid argument is sound. In example 2, the argument, while valid, is clearly not sound because it is not true that all dogs have eight legs and that the president is a dog. It is the form, but not the content, that makes the argument valid. To evaluate an argument properly, another concept must be introduced.

D4 (Soundness)
An argument is sound if and only if (i) all premises are true and (ii) the argument is deductively valid.

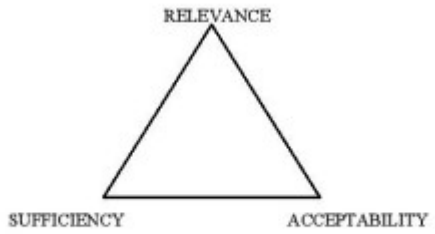
That's all the CM would have to say about argument evaluation. However, is a sound argument certainly good in real argument or argumentation? This answer is NO. Back to example 1, although the first premise is (plausibly) true and the second one true, the conclusion seems to be odd and not to be acceptable for the skipper. That is to say, the seaman's argument is not good even under this definition of soundness. On the one hand, the key issue is that the first premise is plausibly rather than necessarily true. In fact, most statements seem to be true in daily natural language argument. On the other hand, the context is necessary to evaluate a real argument. In the example 1, the questioner happens to be the skipper, so the seaman's answer is not apt since he wholly distorted the intention of the questioner.

So there is a gap, called pragmatic gap, between CM and the evaluation of real argument. Such gap results from the well-known tri-partition of semiotics – syntax, semantics, and pragmatics. An argument is a kind of linguistic act, speech act, and conversational act (Fogelin & Sinnott-Armstrong, 2001, p.3). Therefore, a real argument is always concerned with the tri-partition. Syntax is the study of linguistic expressions of various kinds in their interrelations within a system, in abstraction from their meanings and users. Semantics is the study of the meanings of expressions and their applicability. Pragmatics is an empirical investigation of the human use of language (Cohen, 2001).

Q1 [Pragmatic Gap]
What one focuses on in CM is the syntactic and semantic dimensions while

overlooking the pragmatic one.

Resolving this gap is a key question when discussing argumentation theory and its application. Once people cannot explain some real events in practice with our argumentation theory, what they often doubt is the theory rather than its application. Sometimes they even refuse to accept the original theory. Here we don't think CM should be radically refused, but when some real phenomenon cannot be interpreted and treated by it, we should modify the original theory sensitive to argumentation practice. Therefore, a pragmatic model or informal logical model emerged as the times require.



RSA Triangle

3. *Pragmatic Model and the Münchhausen Trilemma*

In order to resolve the Q1 of argument evaluation, we need introduce the RSA triangle developed by informal logicians Johnson and Blair (1994, p.55). The RSA triangle postulates that there are three criteria for a good argument:

(1) the premises must be acceptable,
(2) the premises must be relevant to the (main) conclusion, and
(3) the premises must provide sufficient support for the (main) conclusion.

In this approach, an argument must satisfy the criteria of relevance, sufficiency and acceptability; a fallacious argument is one that violates one or more of these criteria. Here, sufficiency is equal to deductive validity in the CM. Now we can modify the CM by introducing the RSA triangle and then developing the PM based on informal logic.

D5 [Relevance]
Every premise must be directly or indirectly relevant to the conclusion.

An argument can comprise several subarguments. In this case, the conclusion that should ultimately be justified is entitled the main conclusion, while those statements which support the main conclusion as premises are being supported by other reasons so they are called the subconclusion. Direct relevance means a premise must be relevant to the main conclusion. Indirect relevance implies a premise must be at least relevant to the subconclusion as the premise of

subargument. By relevance we can overcome the paradox of material implication.

D6 [Acceptability]
Every premise must be accepted as acceptable for all the participants in argumentation.

Walton (1989, p.2) argues that an argument occurs in the context of some dialogue. In an argumentation dialogue, there are always at least two parties as participants, the proponent and the opponent, as an audience or a reader. Firstly, every premise must be acceptable for the proponent because an arguer should not make an assertion he or she doesn't believe in. Otherwise the argumentation is pointless. Secondly, the premises should be acceptable for the intended audiences or readers after hearing all the proponent's arguments. Otherwise, these arguments are not successful. Now, a new concept of validity may be introduced as in the following.

D7 [Pragmatic Validity]
An argument is pragmatically valid if and only if (i) all the premises put together can sufficiently support its main conclusion; (ii) every premise must be (directly or indirectly) relevant to the conclusion; and (iii) every premise must be accepted as acceptable for all the participants of argumentation.

However, what's a good argument? In Daniel Cohen's opinion (2001) there are many questions contained in this one. Ethics, politics, aesthetics, epistemology, psychology, jurisprudence, and many other disciplines, all have something to contribute. *In fact*, the Aristotelian triad (Logic, Dialectic, Rhetoric) is often identified with the three p's of product, procedure and process in *mainstream philosophy*, where logic is concerned with the product, dialectic with the rules or procedures required for argumentation, and rhetoric *concentrates* on the communication processes inherent in argumentation (Tindale, 1999, p.3-4). For the purpose of rational persuasion, however, the real core of argumentation theory rests on the tripod of logic, rhetoric, and dialectics. Those three approaches are just what Aristotle, modern informal logicians, and argumentation theoreticians have been focused on all along. From informal logical perspective, a good argument can be defined as:

D8 [Good Argument]
An argument is good if and only if it is semantically, syntactically and

pragmatically valid.

By D8, the pragmatic gap question appears to be resolved, but many questions still exist. First of all, let's examine the sufficiency of argument. It is easy to understand this concept of sufficiency, where the basic idea is based on the truth-preserving, validity and monotonicity of deductive argument in the CM. The MP rule embodies these central viewpoints. In the CM, it is these notions that insure the validity of argument. However, another two new questions appear:

Q2 [Monotonicity Problem]
Is an argument always monotonic?

Q3 [MP Validity Problem]
Are modus ponens arguments always valid?

With the rise and the development of non-monotonic logic, logicians aimed at modelling a commonsense reasoning have given a negative answer to Q2. They have suggested that a real argument is normally defeasible when some new information enters the set of premise as a result of deep cognition. As Donald Nute (2003), who is the developer of defeasible logic, said, "Human reasoning is not and should not be monotonic." We often reject old conclusions based on new evidence, even when those old conclusions were justified by the evidence we had at the time we arrived at them. Justification preserving reasoning is not monotonic. So in the CM monotonic argument is completely abstracted, based on the Close World Assumption (CWA), from the context in which the argument is used.

In the CM, the validity of MP argument is above suspicion. But is it right? Walton gave also a negative answer to Q3. There are many common arguments used in everyday reasoning that have the form modus ponens but are not deductively valid (Walton, 2002). Let's check a classical example in the introductory logic textbooks.

Example 3
If it is raining, then the ground is wet.
It is raining.
Therefore, the ground is wet.

According to the CM, this is an instantiation of modus ponens form and obviously

valid. However, it could be true that it is raining even though it is false that the ground is wet, for instance, the ground could be covered. Thus it is not impossible that all the premises are true but conclusion false. So, as to this example, many questions can be raised whether the example is really a type of modus ponens argument, whether it is truly a deductive argument, and whether it is indeed deductively valid? Therefore, formal validity in the logical sense, said Toulmin, is neither a necessary nor a sufficient condition for soundness of argumentation (cf. van Eemeren at el, 1996, p.133).

As we all know, almost all our logic systems, especially the classical logical systems, are based on deductive validity – and only MP is absolutely necessary among all basic inference rules in these systems. So most people often challenge the truth of premise instead of the premise itself, supposing that they will discover that an argument is not acceptable. In their view, if the premise is not true, then we cannot establish a conclusion, so the argument becomes unacceptable. However, some might say that such a type of argument does not have the form of modus ponens. Why not? Well, they might argue that the first premise isn't really a conditional. It has the form "If A then B", but the defenders of this view might counter that it is not a material conditional, of the kind appropriate for logic, because it is not the sort of conditional of the kind represented by the truth-functional connective called the hook (horseshoe).

In the second place, let's look at the relevance of argumentation. Grice (1989, p.27) identifies relevance as one of the governing assumptions of conversational communication, but he does not provide any theoretical enlightenment as to the nature of relevance. In the introductory logic textbooks irrelevance fallacies have been discussed from the reversed side of relevance – what is irrelevant. However, it is not easy to judge whether a premise is relevant to the conclusion or not and sometimes the judgment itself is a process of making an argument. For example,

Example 4
Harry: Not only should the library remain open longer so that students can have a place to study, but student tuition fees should be lowered as well.
Pam: Hold on, Harry. The topic of this meeting is the proposal for the extension of library hours. What does the topic of tuition fees have to do with it? I don't see the relevance of that issue.
Harry: Well, if students didn't have to pay so much tuition, they could afford better lodging, and therefore better facilities to study at home. I mean it's all

connected because many factors are responsible for not providing students with adequate facilities for studying. Therefore my point is relevant. (Walton, 1989, p. 71-72)

This example shows that sometimes it is difficult to judge the relevance of premise because it not only relate to the context but also to further argumentation. Walton (1989, p.78; 2004) has systematically studied the relevance in argumentation. A useful contribution has been Walton's distinction between "local" and "global" relevance. Local relevance, which equals the indirect relevance, is the relevance of the premises offered in a single argument; global relevance, which equals the direct relevance, is the relevance of a proposition to the issue under discussion. In addition, he distinguished subject-matter relevance and probative relevance. Anyway, it is still not easy to make clear whether a premise is relevant to the conclusion. Maybe it is not relevant at first view but becomes relevant after hearing the arguer's further arguments.

Finally, we will discuss the acceptability of premises. The criterion of "acceptability" is the informal logicians' counterpart to the truth requirement in the formal logicians' doctrine of soundness. Influential in this respect was Hamblin, who argued that truth is an inappropriate criterion for the premises of arguments because it is neither sufficient nor necessary. Truth is not sufficient because a premise that could be ontologically true is actually unknown to be true by arguer. Truth is not necessary because in many arenas the very idea of truth is questionable. Hamblin's argument was not unlike that of the deconstructionist: The idea of truth presupposes an impossible God's eye position from which to view matters (van Eemeren at el, 1996, p.180). However, we can know or believe, by means of some other approaches, whether a premise is acceptable for the participants in argumentation or not.

In an argument there are often two kinds of justification involved, i.e., an internal and an external one. Some scholars think the former is about the form and the latter is about the content (Lodder, 2004). What this kind of interpretation impresses on one is that the former is directly relevant to logic, while the latter lacks of necessary relationship with logic. Actually the distinction between the two justifications is at different levels of argumentation and they should have a close correlation with logic. Consequently, we argue that the former justifies the main conclusion while the latter aims at justifying the premises used in the internal justification.

D9 [Internal Justification]
An internal justification is composed of the main conclusion and its directly supporting premises (reasons).

D10 [External Justification]
An external justification means one that justifies the premises in the internal justification.

A real argument may generally be compared to a mathematical proof. There is, however, an important difference between them. A solid mathematical proof is universally true; a proof that stands once and for all. However, in a daily argument, the premises might be such statements that they are not necessarily true in fact. Some of them describe the opinions of experts, some state the common knowledge which considered plausible, some express testimony of witness or personal ideas, and so on (van Gelder at el, 2002). Once these premises are gathered that justify a claim it still remains an open question whether those premises themselves are justified. By external justification, we can answer the acceptability of premises to some extent. It is a pity then that we maybe run into the *Münchhausen Trilemma*.

In the *Münchhausen Trilemma*, generally speaking, the set of premises is often open in a real argument, that is to say, we can not maybe find an end-point or inartificial ground for justifying for the acceptability of some premise. If someone insists to try to find an ultimate or global justification, it inevitably leads to Albert's so-called Münchhausen Trilemma. The three branches of the Trilemma are:

1. An infinite regress□justification has never an end-point or inartificial ground;
2. A logic circle□a statement that is being justified is used to justify itself;
3. Dogmas□some statements are assumed to be justified by some definitions, regulations, rules, authority opinion and so on.

Lodder (1999, p. 20-23) gave us a good illustration. The first branch of the Trilemma deals with the demand that each premise must in turn be justified.

i. I am King.
ii. Because the first born child of a King becomes King.
iii. Because the constitution says so.
iv. Because the majority of the Parliament wanted it that way

… Because …
n. Because …

This on-going justification is called infinite regress. Each time a statement has been justified by another statement, the latter statement needs to be justified itself. Because the regress is infinite, there is no ultimate (and justified) premise on which a justification can be based.

The regress can be stopped by adopting one of the other two branches: a logical circle or a dogma. An example of a logical circle is the following:

i. I am King.
ii. Because I wear a crown.
iii. Because I am King.

In case of a logical circle one cannot speak of a true justification. If it were considered a justification, then every statement could be justified by itself. From a different point of view the circle does not even stop the regress, namely if the circle is seen as an infinite loop.

The last branch of the Trilemma deals with founding the justification on grounded statements.

i. I am King.
ii. Because the first born child of a King becomes King.
iii. Because the constitution says so.

In the infinite regress example the justification continued at this point. However, it is possible to stop the justification at a certain point. A possible reason to stop might be that it is generally accepted to use the statement as an ultimate justification. In this case it means that a statement that is referring to this constitution does not have to be justified. Such grounded statements are dogmas, comparable to mathematical axioms. They are called dogmas because it is not deemed necessary to justify these statements. However, it is not the case that they never need to be justified. Sometimes it is necessary to allow arguments against these dogmas.

Furthermore, the goal-oriented characteristic of the argument has not only been taken into account, but also context-sensitivity, dynamicity and multi-agent have

partially been involved. Anyway, informal logicians have considered some pragmatic elements in the process of evaluating a real argument, say, acceptability, but an argument is viewed as argument-as-product just like in classical logic. Normally in informal logic, the aim is to identify, analyze, or evaluate an argument found in the text of written discourse. An argument is seen as a product. It is already there and the analyst going only by what is given there. What is given a set of statements, one a conclusion and the others playing the role of premises offering support for (or against the view represented by) that conclusion. But even this task quickly becomes one of arguments as process (Reed & Walton, 2003). As Johnson said, dialogue logic has its focus on the process of arguing whereas informal logic is focused on the product (Johnson, 2000, p. 291). It means informal logic is not enough for evaluating a real argument.

4. *Defeasible Pragma-Dialectical Model (DPDM)*

This model will be based on the Pragma-Dialectical Model (PDM) developed by van Eemeren, et al. (1984; 1992; 1993; 2002; 2004). If the acceptability of the premises is one of the three central objects that the PM is concerned about, then the focus of Pragma-Dialectical Model (PDM) is the acceptability of the conclusion. In PDM, van Eemeren and his colleagues give ten rules for conducting a reasonable argumentative discussion. The ten rules are only necessary for a critical discussion, i.e., it is not true all arguments obeying them are good arguments, but an argument violating them is surely not good, but fallacious. However, PDM was based on classical logic such that it cannot deal with the defeasibility of the real argument.

Defeasibility, which depends on dynamicity, goal-oriented, multi-agent and context-sensitivity, is one of the essential characteristics of real arguments and, in a derived sense, of conclusions. A conclusion is defeasible if it is the conclusion of a defeasible argument. Defeat occurs if a conclusion is no longer justified by an argument because of new information. For instance, the conclusion that a thief should be punished is no longer justified if it turns out that there was a legal justification for the theft, such as an authorized command (Verheij, 1998). Therefore, our goal will be to develop a Defeasible Pragma-Dialectical Model (DPDM) by introducing the Defeasible Modus Ponens (DMP) rule.

The validity rule, as one of the ten rules of PDM, states that the reasoning in the argumentation must be logically valid or must be capable of being made valid by

making explicit one or more unexpressed premises (van Eemeren, Grootendorst & Henkemans, 2002, p. 132). But in PDM, van Eemeren and Grootendorst don't systematically expand the validity rule.

In order to construct a pragma-dialectical model of argumentation, we must first amend MP rule. In fact, R1 should be entitled Strict Modus Ponens (Walton, 2005).

R1 [Strict Modus Ponens (SMP)]*
As a universal rule not subject to exceptions, if p then q.
p is true.
Therefore, q is true.

R1* may be formalized in symbolic logical method as,

$(x)(Px \rightarrow Qx)$
Pa
$\therefore Qa$

As the case stands, pragma-dialectical theorists do not actually care whether the premises are true or not, but focus on the acceptability of these premises and the conclusion. So we have to remodify R1* into R2 so as to be applicable for pragma-dialectical situations.

R2 [Defeasible Modus Ponens (DMP)]
As a rule subject to exceptions, if p then q.
p is accepted as true.
It is not the case so far that there is a known exception to the rule that if p then q.
Therefore, q holds tentatively, but subject to withdrawal should an exception arise.

Verheij (2000) drew a proof-theoretic distinction between R1* (or R1) and R2. SMP is a deductively valid form of argument of the kind widely known and accepted as valid in (classical) logic. However, DMP is not a deductively valid argument so what is less widely accepted is that modus ponens can also have a non-strict, or defeasible, form that can be reasonable in some cases even though it is not deductively valid when applied in these cases. R1* and R2 need to be applied differently to different kinds of cases. In a case where both R1* and R2 might possibly come into play, R2 must always be used. In a case in which only

universal rules that are not subject to exceptions are involved, R1* suffices as the appropriate rule of inference. Although the conclusion is really the same in both forms of argument, the qualifier 'tentatively, but subject to withdrawal should an exception arise' is stated in the conclusion part of DMP, indicating that the inferential relation between the premises and the conclusion is different in this kind of modus ponens argument. The reason for this feature has to do with recognizing each type of argument as distinct from the others based on "indicator words". Now let's explain the Birds Fly Problem (Reiter, 1980) by DMP.

Q4 [Birds Fly Problem]
Birds can fly.
Tweety is a bird.
Therefore, Tweety can fly.

In this argument, classical logicians usually prefer to view the first premise as a universal statement omitted a universal quantifier, while non-monotonic logicians challenge their interpretation. Some non-monotonic logicians argue that the first premise should be explained that most (or many) birds can fly, while others claim that it should be explained that birds can normally (or typically) fly, etc. According to DMP, we can explain as following,

As a rule subject to exceptions, if something is a bird, then it can fly.
Tweety is a bird.
It is not the case so far that there is a known exception to the rule that if something is a bird, then it can fly.
Therefore, Tweety can fly holds tentatively, but subject to withdrawal should an exception arise.

In the CM, we can in nature say "a universal quantifier may be omitted", but this does not mean "all the omitted quantifiers are universal ones". If someone thinks so, he or she actually commits a simple logical fallacy, i.e., it is impossible that SAP can infer PAS by conversion in traditional logic.

DMP should only be applied to certain special cases, but can not be used for modeling strict arguments of the kind based on a rule (or generalization) that does not admit of exceptions. Within the confines of a case of this sort there is no need to use DMP. MP will do. But then, considering cases of realistic argumentation in natural language discourse, DMP is clearly the model of choice

in many cases. Of course, contrasting R1* with R2, the former has preference right over the latter in evaluating a real argument. In other words, if SMP is used in a given case, we cannot replace it with DMP.

In the pragma-dialectical framework, an analysis of argumentation must begin by identifying the main difference of opinion, and what type of difference of opinion it is (van Eemeren, Grootendorst & Henkemans, 2002, p. 3). So resolving the difference can make us walk out the Münchhausen Trilemma of argumentation.

For one thing, let's start with discussing what ontological or epistemic truth is. Truth is a complex problem discussed by many famous philosophers, Aristotle, Austin, Quine, Russell, Wittgenstein, Tarski, Kripke, and so on. According to Catholic Encyclopedia (2006), truth is a relation which holds
(1) between the knower and the known – Logical Truth (Epistemic Truth);
(2) between the knower and the outward expression which he gives to his knowledge – Moral Truth; and
(3) between the thing itself, as it exists, and the idea of it, as conceived by God – Ontological Truth. In each case the relation is, according to the Scholastic theory, one of correspondence, conformity, or agreement. As to pragma-dialectics, we shall only concern with (1) and (3).

D11 [Ontological Truth]
A thing is said to be ontologically true or false if and only if the reason it will be true or false is not that some participant know it.

This kind of truth, which is also called objective truth, real truth or the truth of reality, does not be changed with the some arguer's knowledge database, so it is objective or impersonal.

D12 [Epistemic Truth]
A statement is epistemically true or false if and only if it is known to true or false by all participants of argumentation. This is called subjective truth, too. Compare ontological truth with epistemic one.

It is no problem in the case 1 and 4 because epistemic truth always conforms to ontological truth. But in the case 2 and 3, what arguers will normally focus on can only be epistemic truth rather than ontological truth. In the PDM, the truth which

is concerned is not ontological one but just epistemic one.

D13 [Argumentation]
Argumentation is a verbal, social and rational activity aimed at convincing a reasonable critic of the acceptability of a standpoint by putting forward a constellation of one or more propositions to justify this standpoint (van Eemeren, Grootendorst & Henkemans, 2002, p. xii).

This definition does not only refer to the activity of advancing arguments but also to the shorter or longer text which results from it. Argumentation relates both to the process of putting forward argumentation and to its "product," and the term argumentation covers the two of them. In argumentation theory, argumentation is not only viewed as the product of a rational process of reasoning, like arguments are traditionally seen in logic, but also as part of a developing communication and interaction process.

D14 [Standpoint]
A standpoint is the claim that an arguer defends in critical discussion. In the pragma-dialectical theory the object of argumentation is referred to as the standpoint, which can be positive or negative.

D15 [Difference of Opinion (DO)]
1. Elementary DO: A DO arises when one party's standpoint meets with doubt from the other party.
2. Mixed DO: If the other party is not only doubtful but adopts an opposing standpoint, then the DO is mixed.
3. Multiple DO: If there is more than one proposition involved, the DO is multiple.

A DO always involves two parties. One party puts forward a standpoint and the other party expresses doubts about it – or, as often happens, goes a step further and rejects the standpoint. In all these cases advancing argumentation is a reasonable way of trying to put the DO to an end.

D16 [Resolution of DO]
A DO is said to be resolved as soon as at least one of the two parties revise their original position.

In the elementary form, the resolution is reached if the doubting party abandons his or her doubts, or when the other party retreats from his or her standpoint.

According to van Eemeren and Grootendorst, however, the end of active disagreement does not necessarily mean that the DO has truly been resolved. It is important to distinguish between resolving a DO and merely settling it. Settling a disagreement means that it is simply set aside. This can be achieved in an uncivilized manner by intimidating the other party or forcing him or her into submission. A civilized, but arbitrary, way of settling a disagreement, such as legal disputation, is to lay the matter before a third party who serves as judge and decides who is right. Another civilized way of settling a disagreement is to decide the winner by drawing lots. In such cases the difference of opinion has not really been resolved. True resolution is reached only if both parties come to hold the same position on the grounds of rational argumentation. Either both parties adopt the same standpoint (positive or negative) or else both parties begin to question the standpoint (van Eemeren, Grootendorst & Henkemans, 2002, p.24).

5. Conclusion

According to the PDM, an argument is always put into a special context of dialogue when we discuss how to evaluate it. We focus on the epistemic truth instead of the ontological truth so once a DO is resolved on the basis of rational discussion the standpoints (conclusions) of the two parties in argumentation become acceptable, i.e., epistemically true. In this case, the Pragmatic Problem is not only successfully resolved, but also the *Münchhausen Trilemma* can be avoided. However, the PDM based on SMP cannot deal with the defeasibility of a real argument, i.e., MP Validity Problem, the same as CM, so only if the basic inference rule MP or SMP is replaced by DMP to construct a DPDM, all the problem encountered by CM, PM and PDM can be resolved.

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REFERENCES

Belnap, Neul,(2002), *Semantics* (slides), available at http://www.pitt.edu/~belnap/phil0500/unit161.pdf.

Benthem, J. van (2003). *A Mini-guide to Logic in Action*, Philosophical Researches

(Supplement).
Catholic Encyclopedia. (1907-2006). Available at http://www.newadvent.org/cathen/index.html.
Cohen, Daniel H. (2001). Evaluating Arguments and Making Meta-arguments, *Informal Logic* 21, No. 2, 73-84.
Eemeren, F. H. van & Grootendorst, R. (1992), *Argumentation, Communication and Fallacies*, Lawrence Erlbaum.
Eemeren, F. H. van & Grootendorst, R. (2004). *A Systematic Theory of Argumentation*, Cambridge University Press.
Eemeren, F. H. van at el, (1993). *Reconstructing Argumentative Discourse,* Alabama University Press.
Eemeren, F. H. van, Grootendorst, R. & Henkemans A. F. S. (2002). *Argumentation: Analysis, Evaluation and Presentation*, Lawrence Erlbaum.
Eemeren, F.H. van, and Grootendorst, R. (1984). *Speech Acts in Argumentative Discussions*, Dordrecht/Berlin: Foris/De Gruyter.
Eemeren, Frans H. van & Grootendorst, Rob, (1994) . Rationale for Pragma-dialectical Perspective. In: van Eemeren and Grootendorst, Eds. *Studies in Pragma-dialectics.* Amsterdam: Sic Sat. pp.11-28.
Fogelin, Robert J. & Sinnott-Armstrong, Walter.(2001) . *Understanding Argument: An Introduction to Informal logic*, 6th, ed., Thomson: Wadsworth.
Gelder, T. van & Bulka, A. (2002), *Reason!Able Software*, available at http://www.goreason.com/.
Grice, H. Paul, (1989). *Studies in the Way of Words*, Cambridge: Harvard University Press.
Habermas, J. (1984), *The Theory of Communicative Action*, Beacon press.
Johnson, Ralph H. & Blair, Anthony (1994). *Logical Self-Defense* (U.S. edition), MacGraw Hill.
Johnson, Ralph H., (2000) *Manifest Rationality: A Pragmatic Theory of Argument,* Lawrence Erlbaum Associates Inc.
Lodder, Arno R., (2004) Law, Logic, Rhetoric: a Procedural Model of Legal Argumentation. In: Logic, *Epistemology and the Unity of Science*, Kluwer Academic Publishers, pp.569-588.
Lodder, Arno R.,(1999). *DiaLaw: On Legal Justification and Dialogical Models of Argumentation*, Kluwer Academic Publishers.
Nute, Donald, *Defeasible logic*, O. Bartenstcin et al. (Eds.): INAP 2001 2543, pp. 151-169, 2003.. Springer-Verlag Heidelberg.
O'Keefe, D. J. (1977), Two concepts of argument, *Journal of the American*

Forensic Association 13, 121-128.
Reed, Chris & Walton, D. N.(2003), Argumentation Schemes in Argument-as-Process and Argument-as-Product. In: *Proceedings of the Conference Celebrating Informal Logic* @25, Windsor, Ontario.
Reiter, R. (1980). A logic for default reasoning, in: *Artificial Intelligence 13*, North-Holland, pp. 81-132.
Tindale, C. W. (1999). *Acts of Arguing, A Rhetorical Model of Argument*, Albany,New York: State University of New York Press.
Toulmin, Stephen, (1958). *The Uses of Argument*, Cambridge University Press.
Verheij, Bart (1998). Argument mediation for lawyers: the presentation of arguments. In: *Proceedings of the Fourth International Conference of the International Society for the Study of Argumentation* (eds. Frans H. van Eemeren, Rob Grootendorst, J. Anthony Blair, Charles A. Willard), pp. 820-828. SIC SAT, Amsterdam.
Verheij, Bart (2000). *Logic, Context and Valid Inference Or: Can There be a Logic of Law*. Available at http://www.ai.rug.nl/~verheij/.
Walton, D. N. (2004). *Relevance in Argumentation,* Lawrence Erlbaum.
Walton, D. N.(2005), Justification of Argumentation Schemes, *The Australasian Journal of Logic* 3, 1-13.
Walton, Douglas. N.(1989). *Informal Logic: A Handbook for Critical Argumentation*, Cambridge University Press.