PRESUMPTION, BURDEN OF PROOF AND LACK OF EVIDENCE

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In this paper, existing theories of presumption are compared in order to work out a more comprehensive approach that integrates their insights with recent developments in argumentation and artificial intelligence. Some of the leading theories in the argumentation literature base their analyses of presumption in everyday reasoning on the legal notions of presumption and burden of proof. Studying some examples of presumptions in both legal and everyday reasoning, a dialog-based approach shows how presumption has both a logical component and a dialogical component.

The notions of burden of proof and presumption are fundamental to building a coherent and precise theory of argumentation. There is a growing body of literature about presumption in argumentation theory, but the proliferation of different theories (outlined in section 1 below) suggests that no single theory has yet achieved wide acceptance. These developments, when put together, suggest the usefulness of comparatively evaluating the various theories to build a general theory that brings them together by identifying and integrating the components of an underlying argumentation structure on which they are based. The main target is presumption, but the analysis is built on related work on burden of proof coming out of the artificial intelligence literature (Prakken, Reed and Walton, 2005; Gordon, Prakken and Walton, 2007; Prakken and Sartor, 2007).

The purpose of this paper is to design a logical notion of presumption suitable for argumentation studies. A presumption is basically defined as an inference, but it is not just any inference. It is a special kind of inference. To see how it is special, it is argued that the notion of a presumption has to be defined at two levels, an inferential level and a dialogical level. At the inferential level, a presumption is defined as an inference to the acceptance of a proposition from two other propositions called a fact and a rule. At the dialectical level, a presumption is defined in terms of its use or function in a context of dialog. This function is to shift an evidential burden from one side to the other in a dialog, where the effect of such a shift is on the burden of persuasion set at the opening stage of the dialog. Argumentation is defined as a kind of reasoning used for some purpose in a dialog in which there are two participants, and each participant has the aim of persuading the other to accept the designated proposition called the ultimate *probandum* of that participant.

One of the most culturally significant uses of the notion of a presumption is in law. It is argued in this paper that a logical notion of presumption suitable for argumentation studies is comparable to the way the notion has been used in law. In its legal use, it will be argued, a presumption should be defined as an inference to the acceptance of a proposition in a trial, or in a comparable setting of legal dialog, from two other propositions called facts and rules that are accepted in law, meaning that they have been admitted as evidence at a prior point in the trial (judicially admitted). However, the notion of presumption used in law is slippery and ambiguous, and very hard to define with logical precision. The best we can do is to build a clear and precise logical model of the notion of presumption that represents some aspects of the legal notion in a useful way, and that also represents significant aspects of argumentation more generally.

Once a number of examples of presumptions, both in law and in everyday conversational argumentation, have been examined, the clear and precise logical model

of presumption that is yielded is applied to the difficult problem of distinguishing between presumption and argument from ignorance. Argument from ignorance was traditionally classified as an informal fallacy in logic, but recent work has shown that arguing from lack of knowledge, or lack of evidence reasoning, as it is often called, can often be a reasonable form of argumentation. The problem is that presumptions are characteristically used when there is insufficient evidence or lack of knowledge from which a conclusion can be drawn. The two notions are so closely entangled that it is hard to distinguish one from the other.

1. Survey of Theories of Presumption in Argumentation Theory

A survey of the most influential theories of presumption in argumentation theory has been presented by Godden and Walton (2007), beginning with the account given in Whately's *Elements of Rhetoric* (1846). Whately adopted the conservative position that there is a presumption in favor of prevailing opinions in existing institutions, like the Church (1846, 114). The reasons why he adopted this conservative attitude may not be entirely clear, but his account of the connection between burden of proof and presumption is clear. According to his account, the burden of proof is initially placed on one side or the other at the outset of an argument. This initial placement has an effect on subsequent argumentation. The party who bears this burden has the responsibility of providing reasons in support of his position, and must give up that position if the reasons offered are insufficient or unsatisfactory. However, the raising of the presumption can relieve this burden and shift it from one side to the other.

Whately's account has often been criticized, and not only on the grounds that his conservative position seem to be a kind of special pleading in favor of religion (Whately was an Archbishop of the Anglican Church). Critics like Kauffeld (2003) have argued that he basically does not provide clear criteria for the identification and justification of presumptive inferences, and that his analysis does not give a proper account of the foundation of presumptions because it retreats into notions of common sense and commonly accepted views. However, two features of Whately's account are noteworthy (Godden and Walton, 2007, 37). One is that he treats presumptions as subject to rebuttal, while the other is that on his theory presumption is closely tied to arguments from authority and expertise. Whately was often credited with basing his notion of presumption on principles of legal reasoning, but it has also been claimed that his theory is primarily psychological rather than legal in nature.

Alfred Sidgwick, a lawyer who wrote a well known book on fallacies (1884), amplified Whately's view by writing (1884, 159) that "where a belief is in harmony with prevailing opinion, the assertor is not bound to produce evidence", but " whoever doubts the assertion is bound to show cause why it should *not* be believed (Sidgwick's italics). However Sidgwick was aware of the limitations of this view, and even remarked that Whately's presumption in favor of existing beliefs might amount to nothing more than an *argumentum ad populum*, a type of argument often held to be fallacious in logic. It might also be added that Sidgwick's account of presumption might amount to nothing more than an *argumentum ad ignorantiam*, an argument from ignorance or lack of evidence, another type of argument that has often been held to be fallacious in logic.

Kauffeld (2003) put forward a theory arguing that presumptions are justifiable on social grounds. According to his theory (2003, 140), to presume a proposition is to take it as acceptable on the basis that someone else has made a case for accepting it on the grounds that not accepting it will have the powerful negative social consequences of risking criticism, regret, reprobation, loss of esteem, or even punishment for failing to do so. A prominent feature of Kauffeld's theory is that it presents presumptions as similar to, or even coextensive with, social expectations (Godden and Walton, 322). On his theory, presumptions are grounded on rules of social conduct which, if violated, bring a punitive effect on the violator. This approach could be questioned in its applicability to studying the logical aspects of presumption, as it seems to pay more attention to social and psychological factors than underlying inferential structures. However, as will be shown below, social expectations are important for understanding presumptions.

Ullman-Margalit (1983) recognized that there might be differences in the ways presumptions work in law and the ways they work in ordinary conversational reasoning. She suggested the research proposal of attempting to get a more refined and precise analysis of how presumptions work in ordinary reasoning by viewing them in light of the procedures already codified and widely studied in law. The outcome of her analysis was to define presumption in terms of the characteristic sequence of reasoning from premises to a conclusion. There are three parts to the form of inference defining the sequence (1983, 147). The first part is the presence of the presumption raising fact in a particular case at issue. The second part is the presumption formula which sanctions the passage from the presumed fact to a conclusion. The conclusion is that a proposition is presumed to be true on the basis of the first two parts of the inference structure. She is very careful to describe the status of the conclusion of this presumptive inference, writing (147) that the inference is not to a "presumed fact", but to a conclusion that "a certain fact is presumed".

Ullman-Margalit emphasized the practical nature of presumption and its connection with argumentation from lack of evidence. She described presumptions as guides useful for practical deliberation in cases where there is an absence of information or conflicting information that interferes with the formation of a rational judgment but where nevertheless, some determination must be made in order for an investigation better to proceed (152). She emphasized that presumptions are not always justified, and enunciated the principle that the strength of a presumption in a given case should be determined by the strength of its grounds on a case by case basis (157). She also emphasized the inherent defeasibility of presumptive rules, stating that such a rule contains a rebuttal clause specifying that it is subject to exceptions (149). All these characteristics turn out to be important in the new dialogical theory proposed below.

The dialectical theory of presumption put forward by Walton (1992) was meant to be applied to everyday conversational argumentation. It was not specifically addressed to how presumption works in legal argumentation. According to this theory, in conversational argumentation presumptions take the form of cooperative conversational devices that facilitate orderly collaboration in moving the resolution of a dispute forward even if not everything can be proved by the evidence available.[1] A context of dialog involves two participants, a proponent and a respondent. The dialog provides a context

[1] Note that on this dialectical theory, presumptive reasoning has a negative logic, and is therefore closely linked to lack of evidence reasoning.

within which a sequence of reasoning can go forward with a proposition *A* as a useful assumption in the sequence. The principle of adopting a presumption in a conversational exchange has the form of a dialog rule that appears to violate the usual requirement of burden of proof: even if there is no hard evidence showing that a proposition can be proved true, it can be presumed (tentatively) true, subject to later rejection if new evidence proves it false. On this theory, the key characteristic of presumption as a speech act in dialogue is that it reverses an existing burden of proof in a dialog by switching the roles of the two participants. Normally, the burden of proof is on the proponent asserting a proposition, but when a presumption is activated, this burden of proof shifts to the respondent, once the presumption has been accepted as a commitment in the dialogue. In this dialectical theory, the point where the presumption is first brought forward in a dialogue is called "move *x*", while the point where it may be rebutted is called "move *y*." This working of a presumption is regulated by the following key seven dialog conditions, summarized from the fuller list in (Walton, 1992, 60-61).

C1. At some point *x* in the sequence of dialog, *A* is brought forward by the proponent, either as a proposition the respondent is asked explicitly to accept for the sake of argument, or as a nonexplicit assumption that is part of the proponent's sequence of reasoning.

C2. The respondent has an opportunity at *x* to reject *A*.

C3. If the respondent fails to reject *A* at *x*, then *A* becomes a commitment of both parties during the subsequent sequence of dialog.

C4. If, at some subsequent point *y* in the dialog ($x < y$), any party wants to rebut *A* as a presumption, then that party can do so provided good reason for doing so can be given.

C5. Having accepted *A* at *x*, however, the respondent is obliged to let the presumption *A* stay in place during the dialog for a time sufficient to allow the proponent to use it for his argumentation (unless a good reason for rebuttal under clause III. A. can be given).

C6. Generally, at point *x*, the burden of showing that *A* has some practical value in a sequence of argumentation is on the proponent.

C7. Past point *x* in the dialog, once *A* is in place as a working presumption (either explicitly or implicitly) the burden of proof falls to the respondent should he or she choose to rebut the presumption.

Applying this theory of presumption enables a dialog to move forward, by giving the argumentation a provisional basis for moving ahead, even in the absence of sufficient evidence to prove key premises. How such presumptions should be accepted or rejected in a given case is held to depend on the type of dialog, the burden of proof set at the beginning of the dispute, and factors in specific arguments like argumentation schemes. Walton's account contrasts with Ullman-Margalit's to some extent, as hers appears to be more inferential in nature while his appears to be more explicitly dialectical in nature.

Hansen (2003) proposed an inferential analysis of the structure of presumptive inference that is comparable to that of Ullman-Margalit in that a presumption is always taken to have three parts: a major premise that expresses a rule, minor premise that expresses an antecedent fact, and a conclusion stating a presumption drawn by combining the major and minor premises. However, instead of basing his account on legal reasoning, Hansen based it on Whately's theory that presumptions in ordinary reasoning are inferred from presumptive rules using this three part structure.

Rescher's theory brings the Ullman-Margalit and Walton theories together by making an integrated theory in which presumption has two components that fit together. The first is the dialectical component, meaning that presumption is defined in relation to formal structure of disputation of the Rescher type in which there are three parties. The second is the logical component, in which presumption is defined in relation to a certain characteristic type of logical inference. The latter rests on Rescher's defining principle for an appropriate cognitive presumption (2006, 33) which has the form of a general rule: "Any appropriate cognitive presumption either is or instantiates a general rule of procedure of the form that to maintain *P* whenever the condition *C* obtains unless and until the standard default proviso *D* (to the effect that countervailing evidence is at hand) obtains". *P* is the proposition representing the presumption.

Rescher (2006) at first appeared to be taking up Ullman-Margalit's program of research, when he characterized presumption by outlining the historical development of the use of the concept in law, stating that presumption has figured in legal reasoning since classical antiquity (2006, 1). However, his theory is much broader in its intended applications. It is by no means restricted to explaining how presumptions work in law, or even in everyday reasoning. He also investigates presumption in science and in economic and political decision-making. He takes inquiry and deliberation into account, as well as persuasion dialog. Rescher (1977) also appears to have been the first to develop a detailed account of presumption in an explicitly dialectical framework, drawing both on formal models of disputation and the legal origins of the notion of presumption in burden of proof (Godden and Walton, 324). Rescher wrote (1977, 25) that burden of proof is a legal concept that functions within an adversary proceeding where one side is trying to prove a charge while the other is trying to rebut it before a neutral trier of fact. An especially distinctive feature of his way of analyzing burden of proof using a formal dialog model is that three parties are involved, a proponent and an opponent who put forward arguments and rebuttals, as well as a third party trier who sees that proper procedures are followed and decides the outcome of the disputation.

Rescher (1977, 27) drew a distinction between two different types of burden of proof. First there is the probative burden of proving an initiating assertion, stating that an advocate of a claim in a dialog has the burden of supporting it with argument. Second there is "the evidential burden of further reply in the face of contrary considerations". He calls the second type of one of "coming forward with the evidence" (p. 27). It appears to correspond to what is usually called the burden of producing evidence in law, or the burden of production. Thus it would seem that Rescher's account roughly parallels the two main legal notions of burden of proof (Godden and Walton, 2007, 325). On Rescher's account, presumption is closely related to burden of proof, to rules, and to argument from ignorance. The latter connection is particularly evident when Rescher (2006, 6) writes that a presumption is not something that "certain facts *give* us by way of substantiating evidentiation", but rather something that "we *take* through a lack of counterevidence" (Rescher's italics). It appears that he primarily refers to defeasible rules of the kind that are subject to exceptions[2], and thus in cases where such rules are used to support arguments, it would be expected that in a dialog, arguments and rebuttals would go back and forth from one side to the other. This is in fact the standard format in any

[2] Rescher (2006, 6) specifically states the idea of presumption is closely linked to the notion of defeasible reasoning (default position) in computer science.

formal model of dialog modeling disputation, including Rescher's. Presumption is described in such a format as a device that "guides the balance of reasons" in the shifting of the burden of proof from one side to the other during a disputation. On this account, "a presumption indicates that in the absence of specific counterindications we are to accept how things as a rule are taken as standing" (1977, 30). Thus if there is a general rule that when brought into play favors the argument of one side, a presumption is a device that uses the rule to shift the burden of coming forward with evidence against the other side.

Another feature of Rescher's theory worth noting here there are three especially significant kinds of grounds determining on which side a presumption lies in a dialog. One such ground is negotiated agreement. A second, reminiscent of Whately, is the standing of an authoritative source (39). A third important one is plausibility, for presumption, we are told, generally favors the most plausible among a set of alternatives (38). Note that plausibility on Rescher's account often depends on how things can normally be expected to go in a familiar situation, in a way that is reminiscent of Kauffeld's theory.

2. Presumption and Burden of Proof in Law

McCormick on Evidence, (Strong, 1992, 449) wrote that presumption is the "slipperiest member of the family of legal terms", except for its first cousin, burden of proof. Encouragingly, however, several recent studies of burden of proof and presumption have appeared in artificial intelligence and law (Prakken, Reed and Walton, 2005; Prakken and Sartor, 2006; Gordon, Prakken and Walton, 2007; Prakken and Sartor, 2007) that offer formal models that can render these important but slippery and vague notions into precise tools useful for helping us to precisely analyze and better understand the roles of presumption and burden of proof in legal reasoning.

The following example can be used to show how burden of proof can shift in a murder trial, but it is expressed in relation to how the crime of murder is defined in a specific set of rules for criminal law. Murder is defined as unlawful killing with malice aforethought in section 197 of the California Penal Code. Section 187 defines an exception for self-defense. In the example, there is sufficient evidence to prove the killing and malice elements of the crime based on sufficient evidence so that the defense has accepted these premises. Next, the defense puts forward an argument for self-defense, by calling a witness who testified as that the victim attacked the defendant with a knife. But in the next sequence of argumentation in the example, the prosecution calls another witness who testifies that the defendant had enough time to run away.

The example is modeled in Carneades by the argument graph in figure 1 (Gordon, Prakken and Walton, 2007, 890). At the top part of figure 1 the two premises killing and malice are shown in gray, indicating that they have been accepted. These two leaves in the graph (shown as text boxes), represent premises in the argument. Ordinary premises are represented by lines with no arrowheads. The limits of the crime, killing and malice, are ordinary premises that must be supported by evidence. Pro arguments are represented by ordinary arrowheads. Con arguments are represented by open arrowheads. Assumptions are represented by closed dot arrowheads, while exceptions are represented by open dot arrowheads. The argument itself is represented by the node containing its name a1. The argumentation scheme, a scheme for arguments from legal rules, is

identified in this example as the argument a1. The murder charge is acceptable, based on argument from rule, and given acceptance of the two premises by the defense. Hence the conclusion in the text box at the top (murder) is also shown in gray. We can say with respect to this part of the argument that the prosecution has met its evidential burden. At the next stage, when the defense puts forward its self defense argument, it is shown that section 187 is excluded.

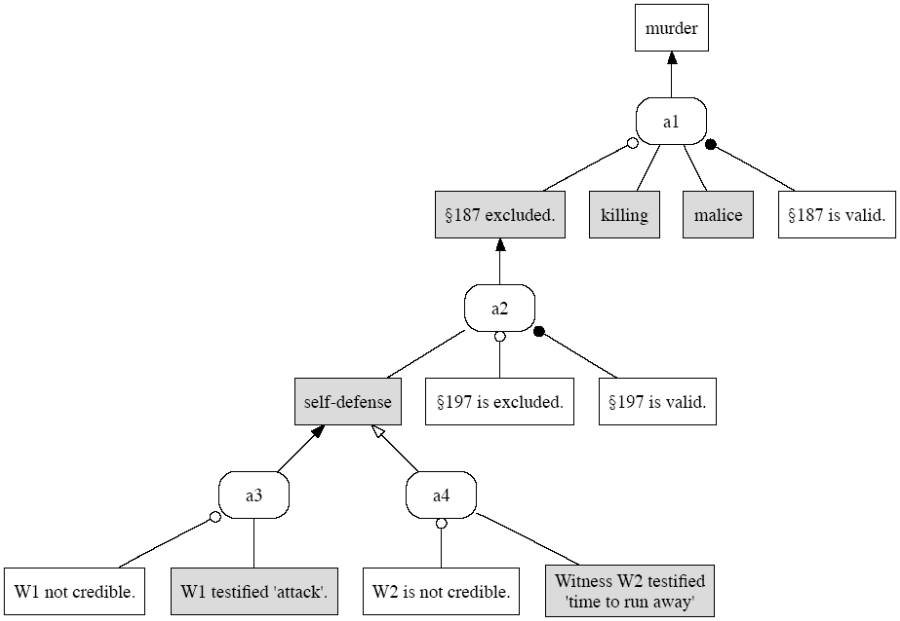

Figure 1: Carneades Argument Graph for the Murder Example

The murder charge is acceptable, based on the arguments supposedly given to back it up by the prosecution. Thus the prosecution has met its evidential burden. At the next level of the graph, the defense calls a witness who testifies that the victim attacked the defendant with a knife. The second argument, labeled a2, is also an instance of the scheme for argument from a legal rule. At the bottom level of the graph on the left, the argument a3, based on the scheme for argument from witness testimony, is brought forward to support the claim of self defense. Assuming that the witness testified in court, we can take it that this testimony is accepted, and this is enough to meet the evidential burden of the defense for the self defense claim. In all the instances shown in the example represented in figure 3, the standard of proof applied is that of a scintilla of evidence (the SE standard). This testimony could be challenged by questioning the credibility of the witness, as shown in the text box at the far left at the bottom. However, instead of doing this, the prosecution chooses another move by calling a second witness to testify that the defendant had enough time to run away.

How does all this affect the burden of proof? To begin with, the prosecution has the burden of persuasion in a criminal case. But after the defendant has met his burden of production for self-defense, the proof standard for the self-defense statement is changed to a standard that reflects the prosecution's burden of persuasion because the standard is satisfied only if the best con argument has priority over the best pro argument. While the

prosecution is the proponent of the main claim, namely the murder charge, the defense is the proponent of the exclusion by the self-defense rule. The defense is also the proponent of the claim that the defendant did act in self defense, but due to the prosecution's burden of persuasion in a criminal case, it has the evidential burden of persuading the trier that the defendant did not act in self defense.

According to the dialogical theory, the function of a presumption in a dialog is to shift an evidential burden of proof from one side to the other in the dialog. The dialogical theory would handle this example by saying that presumption is a kind of move in a dialog different from the move of making an assertion. To presume that a proposition is true is to request the other party in a dialogue to accept it without having to give evidence to back it up and fulfill the normal kind of burden of proof that would be required to back up an assertion.

An example used to support the Prakken-Sartor theory is a case where the plaintiff demands compensation on the ground that defendant damaged his bicycle. The plaintiff has the burdens of production and persuasion that the bicycle was damaged and that he owned it. One way he can prove that he owns the bicycle is to prove that he possesses it. According to Dutch law in such a case, given possession, ownership of the bicycle can be presumed. The presumption in such a case can be expressed by the proposition that possession of an object can be taken as grounds for concluding that the person who possesses the object owns it. According to the Prakken-Sartor theory, this proposition has the form of the default rule, and generally speaking, any legal presumption can be cast in the form of such a default rule. The default rule is this proposition: normally if a person possesses something, it can be taken for granted that he owns it, subject to evidence to the contrary. It is held to be default rule in the Prakken-Sartor theory in the same way the following proposition is: if Tweety is a bird, then normally, but subject to exceptions, Tweety flies. Such a proposition is a default rule in that it holds generally, but can fail or default in the case of an exception, for example in the case that Tweety is a penguin.

According to Prakken and Sartor (2006, 23-25), there are three types of burden of proof that need to be carefully distinguished in law, called burden of persuasion, evidential burden, and tactical burden of proof. The burden of persuasion rests on a party in a trial, or comparable legal proceeding, and it requires that this party must prove a designated proposition by supporting it with grounds that are sufficient for endorsing it at the end of the trial. This proposition is called the ultimate *probandum* of the trial, the ultimate proposition to be proved. For example in Dutch law, to prove the case of alleged manslaughter, the prosecution needs to satisfy its burden of persuasion by proving that the defendant killed the victim with intent (23). Killing and intent are often called the elements of the ultimate *probandum*. To fulfill its burden of persuasion, the prosecution has to prove that the defendant not only killed the victim but did so with intent. This burden of proof does not change over the whole course of the trial, and it is fulfilled or not only in the final stage when the jury decides the outcome of the trial.

In contrast with the burden of persuasion, the evidential burden and the tactical burden are often said to shift back and forth during the course of the trial from one side to the other. In Dutch law (p. 24), the accused can only escape conviction by providing evidence of an exception to the rule that if killing and intent are proved, the defendant is guilty of manslaughter. One exception of this sort would be evidence that the killing was done in self defense. Such evidence could be provided if the defendant could provide a

witness who claims the victim threatened the accused with a knife. However, the defense does not have to prove self defense, by a standard of proof that would be suitable to fulfill a burden of persuasion. All it must do is to produce some evidence, enough evidence to raise the issue of self defense, and it throws sufficient doubt on whether the judge should rule that there is no self defense. This type of burden can be called the evidential burden, but it is also often called the burden of production, or the burden of producing evidence.

There is a third kind of burden of proof that Prakken and Sartor call the tactical burden of proof. Suppose the defense presents enough evidence to fulfill the evidential burden for a finding of self defense, and the prosecution attempts to rebut this argument by bringing forward a witness who declared that the defendant had enough time to run away. If the prosecution's argument is strong enough, it would have the effect of making the prosecution's ultimate *probandum* of manslaughter justified once again. This move puts a tactical burden of proof on the prosecution. They might discharge it, for example, by arguing that the witness put forward by the prosecution is a friend of victim, and that this fact makes her an unreliable witness. Accordingly, a tactical burden of proof can shift from one side to the other, as each side brings forward a new argument. Prakken and Sartor argue (25) that in contrast, the burdens of production and persuasion are fixed, and cannot shift from one party to the other. This claim is clearly true for the burden of persuasion, which remains on a party until the last stage of the trial. However, it seems less clear that the evidential burden is fixed in this way. The reason that Prakken and Sartor give to support their claim that the evidential burden is fixed is that this burden on an issue "is fulfilled as soon as the burdened party provides the required evidence on that issue and after that is no longer relevant". It should be remarked here at there appears to be considerable disagreement and even controversy on the question of whether the evidential burden shifts back and forth. Most legal commentators appear to assume that it does often shift back and forth from one side to the other in a trial, but some commentators, including Prakken and Sartor, have argued that it never does. These disagreements may simply reflect differences in the way the notion of an evidential burden is defined.

3. Presumption and Inference

In one respect, presumption has the same structure as an ordinary defeasible inference. In the most typical case, it is based on two premises, called the fact and the rule. The fact can be described as an atomic proposition in logic, a simple statement that is not conditional (disjunctive, conjunctive) in form. It is called a "presumption-raising fact" in law, and that terminology can be retained here. In law, the facts of a case consist of the evidence judged to be admissible at the opening stage of a trial. A fact is a judicially admitted proposition. The rule is often described as a generalization. Rules can be defined by the following seven characteristics (Gordon, 2008, 4).

1. Rules have properties, such as their date of enactment, jurisdiction and authority.
2. When the antecedent of the rule is satisfied by the facts of a case, the conclusion [consequent] of the rule is only presumably true, not necessarily true.
3. Rules are subject to exceptions.
4. Rules can conflict.

5. Some rule conflicts can be resolved using rules about rule priorities, e.g. *lex superior*, which gives priority to the rule from the higher authority.
6. Exclusionary rules provide one way to undercut other rules.
7. Rules can be invalid or become invalid. Deleting invalid rules is not an option when it is necessary to reason retroactively with rules which were valid at various times over a course of events.

This notion of a rule cannot be a modelled adequately by material implication of the kind used in deductive logic. Instead, rules need to be modeled by identifying the parts of the rule –antecedent, consequent, exceptions, assumptions, and type.

There are different theories about which part of this inference are identified as the presumption. On one theory, the presumption is to be identified with the defeasible rule (Prakken and Sartor, 2006). Often the presumption is identified with the conclusion. It is said that the fact and the rule together "give rise to" the presumption stated in the conclusion. Still other writers talk about presumptive reasoning by equating the presumption with the whole inferential process leading from the fact and rule to the conclusion drawn from it. However, although presumption may be correctly identified as a defeasible inference of this kind with two premises and conclusion, there is another question to be raised. What is the difference between an inference and a presumption?

What makes presumption different from other kinds of inferences is that it is put forward in a special way in a context of dialog where two parties are reasoning together. When one party puts forward an assertion or argument to the other party in such a context, the assertion or argument is typically put forward in such a way that the other party is meant to either accept the assertion or argument or challenge it in some way. It can be challenged by raising doubts about it by asking critical questions, or by demanding some proof of what has been asserted. The respondent to the assertion or argument presented normally has such a right of challenge. Very often the proponent's responsibility to provide such proof is called the burden of proof. What makes presumption different as a way of putting forward a proposition for acceptance in a dialog is that this right of the challenge is at least temporarily removed. It is often said that when a presumption is put forward, instead of there being a burden of proof on the side of the proponent, the burden shifts to the other side to disprove the proposition in question.

Another distinguishing factor that makes a presumption different from an inference that is not presumptive in nature is the probative weight of the premise stating the rule. Normally when an inference is put forward in the form of an argument, the proponent of the argument has to support the premises, if any of them are challenged by the respondent. A premise supported by evidence is said to have probative weight. It is this probative weight that moves the argument forward as a device that forces the respondent to accept the conclusion, given that the argument has a valid logical form. However, in the case of a presumptive inference, a problem is that there is insufficient evidence to prove the premises and give them enough probative weight to move the argument forward towards acceptance. What fills the gap in the case of presumptive inference is that one premise is a rule that is accepted by procedural reasons even though it lacks the probative weight that would be bestowed upon it buy sufficient evidence. In law, the distinction is drawn as follows: "[An] inference arises only from the *probative force of the evidence*, while the "presumption" arises from the rule of law" (Whinery, 2001, 554).

More generally, a presumption arises from a rule that is established for procedural and/or practical purposes in a type of rule-governed dialog (like a trial).

When talking about presumptions, both in law and everyday conversational argumentation, this aspect is typically called the shifting of the burden of proof, described as follows. When an assertion in an argument is put forward a proponent has the burden of proof to support it with evidence if it is challenged by the respondent. When a presumption is put forward, however, this burden of proof on the respondent is no longer there. The presumption is put forward as proposition or an inference that the respondent has to accept. He can't demand proof of a kind that would normally be required to back it up. It is as if the presumption has to be accepted as a fiat or stipulation. Reasons can be given to back up acceptance of the presumption, but they are typically practical reasons relating to the continuation of the dialogue that is underway, as opposed to evidential reasons of the kind one would normally used to back up or prove a claim made.

Hence in one respect, a presumption is simply defeasible inference, and it can be looked at that way. According to Verheij (1999, 115) and Walton (2002, 43) the deductive form of *modus ponens* that we are familiar with in deductive logic may be contrasted with a defeasible form. The strict *modus ponens* form of argument in deductive logic is based on the material conditional binary constant => called strict implication. The variables *A*, *B*, *C*, …, stand for propositions (statements).

Strict *Modus Ponens*

Major Premise: *A* => *B*

Minor Premise: *A*

Conclusion: *B*

In contrast, where is also a defeasible *modus ponens* in which the symbol ~> represents a defeasible conditional that is subject to exceptions.
Defeasible *Modus Ponens*

Major Premise: *A* ~> *B*

Minor Premise: *A*

Conclusion: *B*

Verheij (1999, 115) (2000, p. 5) called this form of inference *modus non excipiens*, but it was called defeasible *modus ponens* (DMP) in (Walton, 2002, 43). To cite an example, the following argument arguably fits the form of DMP: if something is a bird and generally, but subject to exceptions, it flies; Tweety is a bird; therefore Tweety flies. If we find out that Tweety is a penguin, the original DMP argument defaults. It is best seen as an argument that holds only tentatively during an investigation, but that can fail to hold any longer if new evidence comes in that cites an exception to the rule specified in the major premise. *Modus ponens* arguments, whether of the strict or defeasible type, are

typical linked arguments. Both premises go together to support the conclusion. If one is taken away, there is much less support for the conclusion in the absence of the other.

4. Examples

In the following case, Donald bought a new printer from Hewlett Packard, and later returned it to them, asking for his money back. However, the printer had been returned to Hewlett Packard in a damaged state. They did not want to return his money, claiming that they delivered the printer to Donald in good condition (with no damage). Donald claims that he is owed restitution (his money back) for the damage. Hewlett Packard claims that since they delivered the printer to Donald in good condition, the damage must have been due to him. Thus in this case, we have a conflict of opinions. Each side has a thesis, or claim made by that side, and the proposition claimed to be true by the one side is opposed to that of the other side.

What happens when a case like this is disputed is that a general legal rule will be applied to it. *McCormick on Evidence*, (Strong, 1992, 455) cited the following general rule recognized and accepted in law: if a first party proves delivery of property to a second party in good condition, and also proves that it was returned in a damaged state, a presumption arises that the damage was due to the second party (456-457). This generalization may not be itself a law, but it might be recognized as having the force of an accepted legal rule, as it has been relied on in may cases ruled on at trial, and may have been specifically cited and accepted as a principle by judges in their rulings.

Williams (1977, 156) offered the following example in English law of a rule stated in section 25(3) of the Theft Act: “Where a person is charged with an offence under this section, proof that he had with him any article made or adapted for use in committing burglary, theft or cheat shall be evidence that he had it with him for such use.” This rule relates to the offense of possessing “burglarious implements”, as Williams calls them (156), or burglar tools, as we would call them. As a particular instance, let’s consider a case where a person was charged with an offense under this section, and evidence was presented that he had articles with him that fit the description of burglar tools. In such a case, the conclusion would immediately follow he had these articles with him for use in committing burglary. In other words, given this rule, the factual finding of these articles on the person charged is sufficient for acceptance of the proposition that he had these articles with him for use in committing burglary.

This kind of case is a good example to illustrate how a presumption works in law. The general rule is stated by law, in this case in the Theft Act. The factual premise is the proposition that articles that may be classified as burglar tools were found on the person charged with the offence. The presumption that arises is the proposition that the person charged with the offence had these articles with him for use in committing burglary. As shown in figure 2, the rule and the factual premise constitute the two premises of a defeasible inference that leads to the conclusion that he had these articles with him for use in committing burglary.

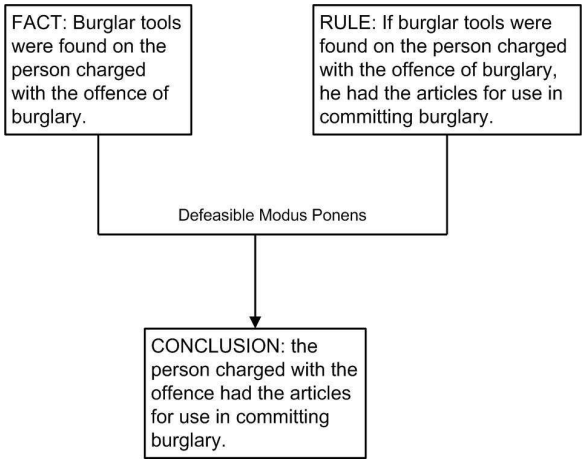

Figure 2: Structure of the Presumptive Inference in the Theft Act Example

This conclusion constitutes that is often said to be the presumption that arises in such a case.

According to Williams (1977, 156) this example illustrates how an evidential burden works in law. When a person is found with such articles, a burden is placed on him to give some explanation of why he had such articles in his possession at the time, offering evidence that the articles he had with him were for some use other than committing burglary. If he fails to offer such evidence, the proposition that he had these articles with him for use in committing a burglary will stay in place as accepted by the court. In other words, it can be said that in such a case, once the fact and rule are accepted by the court, the conclusion produced by them is lodged in place, until such time as the defendant can produce evidence against it. We can say then that the defendant now has an evidential burden to discharge. It is this phenomenon that is frequently described by commentators as the shifting of an evidential burden. We can see, however, that what produces the shifting of the evidential burden in this case is a presumptive inference resting on a factual premise and a rule. Next we turn to some examples of presumptions used in everyday conversational reasoning.

In many cases of everyday conversational reasoning, it may be evident that some presumption has been made, but how it was connected to some burden of proof operative in the case may not be evident. However there are some cases where such a burden of proof can be identified and classified, even though it is not explicitly stated.

The Seat Belts Example

Coming back on the flight from the Chicago APA 08 meeting, there was a little turbulence, and the pilot announced to the passengers to fasten their seat belts. A little later, the pilot announced that the passengers could undo their seat belts, and could get up and walk around if they wished. A little later, the pilot announced to the passengers to fasten their seat belts again. He added that although there was no evidence of further turbulence, he felt it was better to err on the side of safety. A little while later, he announced once again that passengers could undo their seat belts.

This case is a typical and very common type in which the factor of safety in a case sets a burden of proof to one side. In this case, pilot may not have had any visual evidence or weather report evidence of further turbulence, but he still may have had a slight suspicion that there could be some further turbulence. Or to put it in a negative way, he may not have felt sure enough that there wouldn't be any further turbulence.

In such a case, we need to note that the seriousness of the consequences on both sides of the decision needs to be taken into account. If the pilot announces that the passengers need to fasten their seat belts again, it is only a minor and temporary nuisance for the passengers. However, if he doesn't make any announcement, and there is turbulence, the outcome could potentially be serious. For example, some passengers could be thrown around the cabin or injured, depending on how bad the turbulence is. We could describe the pilot's reasoning in this kind of case using the notion of presumption. Although he reported that he had no evidence that there would be further turbulence, he acted on the presumption that there might be, by telling the passengers to fasten their seat belts again. Thus he could be said to have made a presumption, even though there was no evidence, or no objective evidence at any rate, supporting the truth of the proposition that he accepted as a presumption.

The clue to how best to analyze the reasoning in this case can be found in the pilot's saying that it was better to err on the side of safety. The pilot doesn't know whether there will be turbulence or not. No specific evidence indicates that there will be. But there is a possibility of error. This possibility would be apparent to the pilot, who has a lot of experience of flying in this type of plane in conditions in which there is turbulence. Since the possibility of error exists, a way of making the decision is to look at the cost of error on both sides. Even though the probability of there being turbulence may be fairly low, the cost of it may, at least potentially, be comparatively high.

Announce to passengers to fasten belts.	Cost of error: small inconvenience.
Make no announcements.	Cost of error: potential for injury.

In this kind of case, the pilot has two choices. He can presume that there will be turbulence, or that there will not be. The probability of their being turbulence may be so low, based on the objective evidence, that from the point of view of cost benefit analysis (weighing the costs of the two outcomes against the probability of the occurrence of each) the right decision may be to make no announcement. But this point of view ignores the burden of proof to tilt the decision to the side of safety if there is a possibility of error. Hence a presumption is made and acted on. The presumption is made that there will be turbulence, and the action taken in line with this presumption is to announce to the passengers to fasten their seat belts again.

5. Arguments from Ignorance

It has been known for some time that arguments from ignorance represent an argumentation scheme, but one that is closely tied in with shifts in burden of proof. For example, consider the argument, "You can't disprove my claim, therefore you must accept it". Such arguments are associated with the informal fallacy of argument from ignorance: a certain proposition is not known to be true, therefore it must be accepted that

it is false. Based on this form of argument, if a claim can't be disproved, that would be a reason for accepting it. However, recent work has shown that this form of argument is not always fallacious, and that it is a heuristic we use all the time to go ahead and provisionally accept a conclusion. Such arguments are less prejudicially called lack of evidence arguments rather than arguments from ignorance, a label that has negative connotations, perhaps suggesting that all arguments of this form are fallacious. An example is the hypothesis that Romans did not give military decorations posthumously (Walton, 1996, 66-67). Historians have examined considerable evidence from tombstones, from historical writings on military campaigns, and from other evidential sources, and none of these sources offers any evidence of a posthumous military decoration. What can properly be concluded from this historical evidence? The conclusion can be drawn that that Romans did not give military decorations posthumously. Of course, the inference that this conclusion is based on needs to be regarded as defeasible, meaning that it needs to be treated as subject to exceptions. Hence historians need to be prepared to give up the hypothesis if new evidence comes in showing a case where a Roman soldier was given a military decoration after his death. The long and the short of this discussion is that the so-called argument from ignorance traditionally deemed to be a fallacy can be a reasonable argument under the right conditions of its use.

Notice as well that this argument from ignorance can be described as a presumptive inference based on burden of proof. The facts in the case are that historians have examined considerable evidence from tombstones, from historical writings on military campaigns, and from other evidential sources, and none of these sources offers any evidence of a posthumous military decoration. If it is true that none of these sources offers any evidence of a posthumous military decoration, the conclusion can be drawn defeasibly (in the absence of any evidence to the contrary) that Romans did not give military decorations posthumously. Such an inference is a classic case of presumptive reasoning, as will be shown in the analysis of presumptive reasoning below.

Trying to examine a real case of argumentation used in a given text of discourse, argumentation schemes and other argumentation devices can be combined. It is possible for two such devices or schemes to be combined into one case, and in some such cases one scheme is the basic scheme whereas the other is merely peripheral. The question of how to sort out this kind of problem when dealing with presumptive reasoning, burden of proof and argument from ignorance can be posed in a more specific way by examining the following real example.[3]

Representative Keith Ellison became the first Muslim ever elected to the U.S. Congress on November 7 2007. During an interview with Ellison on the November 14 edition of his CNN headline news program, Glenn Beck asked Ellison to "prove to me that you are not working with our enemies". He added "And I know you're not. I'm not accusing you of being an enemy, but that's the way I feel, and I think a lot of Americans will feel that way". Ellison replied: "Well, let me tell you, the people of the Fifth Congressional District know that I have a deep love and affection for my country. There's no one who's more patriotic than I am. And so, you know, I don't need to - need to prove my patriotic stripes".

[3] The text of the whole interview can be found at the following site [accessed December 23, 2007]. http://transcripts.cnn.com/TRANSCRIPTS/0611/14/gb.01.html

The question-reply sequence in this example is reminiscent of some of the standard cases of the argument from ignorance that have been studied in the fallacy literature. Probably the most obvious case is the spy example, where someone is accused of being a spy and then has to prove that he is not a spy (Walton, 1996, 97-110). Refuting a negative accusation of this sort is very difficult, and ultimately it may be impossible to refute the charge conclusively. Thus if one is accused of being a spy without any evidence being offered to back up the allegation, the most reasonable strategy is generally to shift the burden of proof back to the other side in some way. For example, the person accused might demand that his accuser produce some evidence of the allegation, and perhaps also express his dismay that the accuser has made such an unwarranted allegation without evidence to back it up.

It is very hard for someone accused of being a spy to prove he is not a spy, because any evidence concerning such an allegation is secretive. This difficulty of disproving an allegation was also evident in the case of the congressmen accused of working with enemies, just above. It seems like the best response to the allegation is to say, “Prove it, and if you can’t, you must withdraw the allegation”. This response invokes the general principle of burden of proof requiring that if a claim is made, it must be backed up by evidence or it must be retracted. Such a reply may not be very effective rhetorically, however, because any accusation, once made, tends to stick, leaving a lingering suspicion by innuendo, because even though there may be no evidence to prove it, there may also be no evidence to disprove it. On the basis of a presumption for safety (spies are dangerous to national security), the conclusion that may be suggested is that we should take care in telling this individual any secrets.

The congressman case is subtle, because the interviewer claims that he is not accusing him of being an enemy. On the other hand he says that a lot of Americans will feel that way, which does give a weak reason to think that the accusation might be true, or at least that a lot of viewers might think it is true, and therefore that it is worth rebutting. If the congressmen were to reply that there is no evidence that this claim is true, that might appear weak, even though logically speaking it does seem to be the correct response. His reply is that he doesn’t need to prove his patriotic stripes. This reply is rhetorically clever as well as being appropriate as a way of answering the question. Although it does seem to be an argument from lack of evidence, in certain respects, more importantly it seems to shift the burden of proof against the questioner by raising a presumption. The congressman does not attempt to prove that he is patriotic, but he reasons on the basis that that proposition is not subject to doubt, and therefore he does not have to prove it.

Thus a general problem for argumentation theory is posed. How can we distinguish (a) lack of evidence reasoning, (b) presumptive reasoning and (c) shifts in a burden of proof?

A professor lives too far from the university to walk home, and his wife has the car, so they make an arrangement so that on many days he walks part way home, along a street called Wellington Crescent, and she picks him up there. One day as he is leaving in the morning, he says to her, “if you don’t hear from me, I’ll meet you on Wellington Crescent”. She knows that it means that he will be walking that evening, expecting her to pick him up on Wellington Crescent, and not at the university.

This is a case of a particular presumption. In another kind of case, the husband and wife might also operate on a general presumption that if neither of them says anything in the morning, both will take it that he will be walking home that evening, and are supposed to meet on Wellington Crescent. In this case, there is a general rule that if he doesn't tell her in the morning that he wants to be picked up after school, she is supposed to meet him on Wellington Crescent. Note that this general rule is expressed in a conditional form. Note also that it is a defeasible rule. If there is bad weather, and walking conditions are not good, one can phone the other during the day and suggest that it might be a good idea that he should be picked up rather than walk home. Note also that in both cases what is happening looks like it could come under the category of argument from ignorance. For example when he says "if you don't hear from me, I'll meet you on Wellington Crescent" the antecedent of the conditional has a negative form. Her conclusion to meet him on Wellington Crescent is derived from an absence of information received.

The language of presumption and its relation to associated logical concepts can sometimes be slippery and confusing, because, at least as argued in this paper, these terms need to be defined in a way that is sensitive to context. Let us contrast two types of cases to bring out this point. One is the standard type of case where a person is declared legally dead because he has not appeared for a fixed period of years. We take this to typically refer to a normal kind of case in which a person was living a normal life in a house in a city, let's say, and he just disappeared one day without leaving any traces of where he might have gone. Let's contrast this with a different type of case where a person is hiking in the wilderness in the mountains in a cold and inhospitable area where it is not possible for even an experienced woodsman to survive for more than a week. Let's say, to add a statistical component, many people have been lost in this area, and none has survived for as long as a week.

In the first case, it is easily possible for the person to survive for the number of years at issue, say five years. It's just that he disappeared without trace, and so there is no evidence of his survival. In the second case as well, there is no evidence of the person's survival. Hence both cases appear to fit the category of a lack of evidence argument, argument called *argumentum ad ignorantiam* in logic. But are both cases instances of presumptive reasoning. Certainly the first one is, for all the reasons argued above. But it can be argued that the argument in the second case is based on evidence, as opposed to presumptive reasoning. The arguments supporting this contention is that the lack of any evidence of the person's survival, given the existing conditions hostile to survival, should be considered a kind of evidence in its own right. It can be called negative evidence. This issue, however, is controversial. Some have argued that negative scientific evidence should be taken into account when reporting experimental results, and others have argued that experimental results based on negative evidence should not be published. This controversy continues, but if it is correct that negative evidence can properly be described as a kind of evidence, than the argument in the second type of case is based on evidence, as opposed to presumption. According to the new theory presented above, something is a presumption, or an instance of distinctively presumptive reasoning, if the evidence by itself is insufficient to prove the conclusion that is drawn and put forward. If the evidence is sufficient, the case is no longer one of a presumption.

5. The New Dialogical Theory of Presumption

The function of making a presumption is to enable a discussion or investigation to move forward without getting continually bogged down by having to prove a proposition needed as part of an argument required to help the investigation move forward. The problem may be that proving such a proposition may be too costly, or may even require stopping the ongoing discussion or investigation temporarily so that more evidence can be collected and examined. The problem is that a particular proposition may be necessary as a premise in a proponent's argument he has put forward, but the evidence that he has at present may be insufficient to prove it to the level required to make it acceptable to all parties. Hence moving forward with the argumentation may be blocked while the opponent demands proof. The two parties may then become locked into an evidential burden of proof dispute where one says "you prove it" and the other says "you disprove it". This interlude may block the ongoing discussion. A way to solve the problem is for the proponent or a third party to say, "Let's let this proposition hold temporarily as a premise in the proponent's argument, so that we can say he has proved his contention well enough so that we can accept the conclusion of his argument tentatively as a basis for proceeding." If necessary, later on, the subdiscussion can be continued by bringing in more evidence for or against the proposition that served as the premise.

There is also a more subtle but no less important distinction to be drawn between a presumption and a putting forward of that presumption. The putting forward of a presumption can be seen as a kind of speech act in a dialog, while the presumption itself can be identified, as indicated above, by the inference it is part of. The same ambiguity attaches to the concept of an argument, and is a common source of confusion. A distinction needs to be drawn between an argument, and the putting forward of an argument for acceptance in a dialog. From one point of view, a traditional one in logic, an argument can be viewed simply as an inference from premises to a conclusion. Or, from another point of view, an argument can be seen as something that is put forward by one party for acceptance by another party. An argument, on this latter view, is something that is advanced or advocated by a claimant. It is something that has the function of backing up a claim by giving reasons to accept it.

Krabbe (2001) studied the problem of retraction and persuasion dialogue, and showed how the notion of a presumption is important for solving this problem (151-153). He offered an example of a dialog (152) similar to the following one illustrating some conditions for retraction of a presumption. The dialog illustrates a presumption in favor of a source of evidence that is generally accepted as trustworthy, like a weather forecast.

Wilma: The fine skating weather is holding.
Bruce: Why?
Wilma: The weather forecast says so.
Bruce: So what?
Wilma: You can usually trust the weather forecast. Why not in this case?

At his second move, Bruce refuses to accept Wilma's argument that the fine skating weather is holding because the weather forecast says so. When he says "So what?", he implies that he does not accept the weather forecast as a reliable source of evidence about the weather. But the problem is that he has given no reason why the weather forecast

should not be accepted as a reliable source of evidence. Wilma replies at her last move by pointing out that the weather forecast is generally accepted as trustworthy. Here she is actually giving a reason to support acceptance of the inference that what the weather forecast said implies that the fine skating weather is holding. Whately would have analyzed this case by calling this acceptance a presumption in favor of authority. In more recent terms, we could say there is generally a presumption in favor of expert opinion.

As part of her last move, Wilma adds the remark, "Why not in this case?", at the end of her last move. This remark has the effect often described as that of reversing the burden of proof. It is reminiscent of the recent literature on what should be the effect of asking a critical question in response to a defeasible argument like argument from expert opinion. In some instances, the asking of the critical needs to be backed up by supporting evidence before the question defeats the original argument. Krabbe (151) puts this point by writing that after Wilma's last remark, it is up to Bruce to justify his challenging of the presumption that you can usually trust the weather forecast. Krabbe concludes, "Hence there has been a role reversal" for at that point in the dialog, the burden of proof has fallen on Bruce, not Wilma (151). Krabbe uses this dialogue to make the point that even though presumptions may not be easy to retract, they are retractable, and need to be retracted under the right conditions in a dialog structure that represents rational argumentation. Judging by this example it appears that Krabbe basically accepts the contentions of the Walton theory that one of the conditions under which a presumption needs to be retracted is that evidence is given against it, but that in a case like the example dialog above where no such evidence has been given, the presumption stays in place.

However it is evident from Krabbe's discussion that he sees the notion of a presumption in a different way from the way it is seen in the Walton theory. This difference is made evident in a remark in a footnote Krabbe (2001, 158): "Walton stresses the way a presumption is introduced into the dialogue by a speech act of presumption. At present we are more interested in the way a presumption may be withdrawn from the dialogue." Following up this remark into personal communication (e-mail of April 4, 2008), Krabbe wrote that Walton writes about presumption as a kind of speech act whereas Krabbe treats it as a kind of commitment. He added that what Walton calls a presumption he would call "proposing a presumption". It is a little hard to compare the separate writings of Walton and Krabbe on presumption, even though both are based on a dialog theory approach because there seems to be a basic terminological difference underlying the treatment of presumption in the two sets of writings.

These observations suggest the usefulness of drawing a distinction between two notions that are often confused: (a) the notion of presumption itself and (b) the speech act of putting forward a presumption for acceptance by another party in a dialog. This distinction is fundamental and highly important, despite the fact that it has not been clearly recognized in the past and is often overlooked. Interestingly, the same kind of fundamental ambiguity affects the notion of an argument, because a distinction needs to be made between what an argument is, and the speech act of putting forward an argument for acceptance.

For these reasons, it has clearly been shown that it is necessary to revise the older Walton theory of presumption, and to see the older theory as presenting a definition of the speech act of putting forward a presumption in a dialog. This revision leaves the

question open of how to define a concept of a presumption. The older Walton theory shows that it is something put forward in a dialog, and it offers a set of normative conditions defining how it should be put forward, and how the other party and the dialogue should properly react to its being put forward. However the older theory does not define what it is that has been put forward. To fill this gap, a new theory of presumption needs to be advanced.

In presenting the dialogical theory, the following answer has been given to the question of how presumption is related to evidential burden. As explained above, the general principle of burden of proof requires that the party who makes the claim and puts forward the argument for its acceptance must supply evidence to back it up if the claim or argument is questioned. But it commonly happens that, for various reasons, it may be difficult or problematic to meet this requirement. It may be too costly to obtain such evidence, or even more generally, it may take such time and effort to obtain it that this quest would obstruct the progress of the dialog currently moving forward in its argumentation stage. In some instances, presumptive reasoning can be the tool of choice in overcoming this problem. In such cases raising a presumption can be a way to, if not meet the evidential burden, at least satisfy the need to meet it by justifying the drawing of a conclusion on a tentative basis. Thus, although the claim challenged has not been proved, satisfactory, even if temporary, substitute for proof has been offered.

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