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Between Evidence and Facts: An Argumentative Perspective of Legal Evidence

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Abstract: In this paper, we will present an argumentative view of legal evidence. In an argumentation-based litigation game, the only purpose of the suitor (S) or the respondent (R) is to maximize their own legal rights while the purpose of the trier (T) is to maintain judicial fairness and justice. Different selections of evidence and different orders of presenting evidence will lead to different case-facts and even adjudicative results, the purpose of litigation is to reconcile a balance among the three parties - S, R, and T.

Keywords: Legal evidence, Argumentation-based litigation game, judicial fairness and justice

1. Introduction

Regarding the meaning of evidence, we should not only distinguish legal meaning from everyday meaning, but also from philosophical meaning. It is also an important basic concept in other disciplines such as Archeology and Medicine. However, unless otherwise specified, the concept of *evidence* discussed here refers to *legal evidence*, and, *evidential reasoning* and *fact argumentation* refer to *evidential reasoning* and *fact argumentation* in law, respectively. The supportive relationship between the set of evidence and the set of facts determines that both of them are inseparable, which is fully reflected in the law system of the mainland China. The three procedural laws in the mainland China (excluding Hong Kong and Macau, the same below) have particularly emphasized the important status of evidential reasoning and fact argumentation.

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According to Article 50 of the Criminal Procedure Law of the People's Republic of China, for example, all materials that can be used to prove the facts of a case are evidence. This clearly shows that the set of evidence and the set of facts are inseparable in litigation. From the logical point of view, this is a standard connotative definition. In this paper, we will use this definition as a starting point to explore related theoretical issues of legal evidential reasoning and fact argumentation in the context of the mainland China law system.

2. Legal evidence: the objective basis for case-ruling

Identifying the facts of a case in law is the customary *case-ruling*, and legal evidence is the objective basis for ruling the facts of case. In the Chinese law system, as in other law system, evidence has an indispensable status, which is clearly reflected in the relevant provisions of the three procedural laws. For example, Article 50-3 of the Criminal Procedural Law states: "Evidence must be confirmed before it can be used as the basis for ruling a case"; Article 63-2 of the Civil Procedure Law of the People's Republic of China stipulates: "Evidence must be confirmed to be the basis for ruling a fact"; Article 33-2 of the Administrative Procedure Law of the People's Republic of China states that "Evidence must be confirmed by the court before it can be used to rule the facts of case." As for the terminology of evidence and fact and their relationship, although their own expressions in the three procedural laws are slightly different, there are no essential differences. The so-called "ruling a case" or "ruling a fact" means "ruling the facts of a case", and the so-called "a fact" means "a case-fact", their consensus is obviously that evidence and fact are two different concepts, which cannot be confused and there is a supportive relationship between the two.

Evidence is not only a familiar term for lawyers, judges, prosecutors and other legal practitioner, but also a term often used by anthropologists, historians, natural scientists, and even philosophers. Especially in epistemology and philosophy of science, the concept of evidence is even more central. In the *Enquiry concerning Human Understanding*, for example, Hume (2007, p.80) believes that a wise man proportions his belief to the evidence. In his book *Philosophy in the Twentieth Century*, Ayer (1982, p.18) says, "from his own part, I think that if one were looking for a single phrase to capture the stage to which philosophy has progressed, 'the study of evidence' would be better than 'the study of language'". In fact, philosophy of language belonged to the distinguished study of philosophy in the twentieth century. According to Quine & Ullian (1978, p.16), "insofar as we are rational in our beliefs, however, the intensity of belief will tend to correspond to the firmness of the available evidence. Insofar as we are rational, we will drop a belief when we have tried in vain to find evidence for it". This shows that rational thinkers usually respect evidence, and evidence is closely related to rational decision-making, let alone to respect evidence in litigation.

First, as to the definition of evidence, there has generally been a dispute between the theory of evidence-*qua*-material and the theory of evidence-*qua*-fact the legal theoretical and practical communities. The theory of evidence-*qua*-material is said to be the theory of evidence in the Criminal Procedural Law. This view of evidence was

formally established in 2012 by *the Decision of the National People's Congress on Amending the Criminal Procedural Law*, which was adopted at the Fifth Session of the Eleventh National People' s Congress on March 14, 2012. Based on the material definition, evidence refers to the material used to prove the facts of a case. The view of evidence-*qua*-material is clearly reflected in the definition of evidence in the Criminal Procedural Law: on the one hand, evidence is defined as all materials that can prove the facts of a case; on the other hand, evidence is divided into physical evidence, documentary evidence, including witness testimony, victim statements, criminal suspects & defendants' confession and defense, and expert opinions. In this sense, legal evidence is the materials that is the physical object, and is often the abbreviation of evidence-*qua*-material. In other words, evidence is the evidence-*qua*-material. However, as Robin G. Collingwood (1889-1943) says in his book *The Ideal of History* (1946), "when we try to define '*evidence'*… we found it very difficult" (cf. Kelly, 2016). For example, in forensics, evidence includes fingerprints on guns, bloody knives, semen-soaked clothes, and so on. This type of evidence is typical because they can be put in plastic bags and labeled with evidence A, B, C and so on.

Second, from the evidence-*qua*-fact theory to the evidence-*qua*-material theory. According to the former, the term "*evidence*" refers to all facts that prove the true circumstances of a case. This view of evidence was established in the Criminal Procedural Law (later three amendments made in 1996, 2012, and 2018, respectively) in 1979. From the theory of evidence-*qua*-fact established in 1979 to the theory of evidence-*qua*-material modified in 2012, this is a major advance in the history of so-called evidence law in the mainland China. Because evidence was originally used to prove the facts of a case, according to the material definition, if we omit it secondary components and retain only the main ones, i.e. its subject, predicate and object, it becomes *evidence-as-fact*. Since evidence is used to prove facts, how logically is *evidence-as-fact* justified? This is obviously logically impossible. The evidence-*qua*-fact theory obviously confuses evidence with fact, ignoring the relationship between evidential reasoning and fact argumentation between them. When we examine the adjudicative documents in the landmark criminal unjust, false and wrong cases of She Xianglin (佘祥林案), Zhao Zuohai (赵作海案), and Nie Shubin (聂树斌案) from this perspective of evidence in the contemporary Chinese judicial history, we will be surprised to find that there does not appear to be a problem of "unclear facts" because their adjudicative results are all based on the principle of "*based on facts and laws*". The root of these painful lessons is the theory of evidence-*qua*-fact, because the link of evidential reasoning is actually blurred, but the evidence-based litigation game is out of our question here. In this case, the frequent occurrence of unjust, false and wrong cases can be imagined.

Then, after the material theory of evidence was established in 2012, has the problem of the relationship between evidence and facts been solved? The answer may be very regrettable. According to Kelly (2016), a tension soon emerges when one compares philosophical account of evidence with the way of the concept is often employed in non-philosophical contexts. For example, Russell tends to think of

evidence as sense data; Quine maintains that evidence consists of the stimulation of one's sensory receptors; the logical positivists hold that whatever evidence there is for a given scientific theory is affordable by observation statements (cf. Kelly, 2016). Otherwise, Williamson (2000, pp.11-12) explicitly states that rationality requires one to conform one's beliefs to one's evidence, and the propositions which one is permitted to assert outright are exactly those which constitute one's evidence. Their views of evidence are related to epistemology. From this, we will find that the subtle difference between the concept of evidence between the legal sense and the philosophical sense. According to the former, evidence is a material, while, according to the latter, evidence is a proposition or statement. In other words, evidence is a proposition known to be true in the philosophical sense. In fact, in the legal field, some scholars hold the latter, such as defining evidence as a proposition of fact and sometimes as an *evidential fact* (cf. Ho, 2015). This view of evidence seems similar to the theory of evidence-*qua*-fact discussed earlier, but it is completely different in essence, because it emphasizes that evidence is a factual proposition or statement, while the theory of evidence-*qua*-fact emphasizes that evidence equals to fact. Maybe we can call this view of evidence-*qua*-proposition. Obviously, this is a view from a (classical) logical point of view.

From the perspective of legal logician, here we first follows Ho Hock Lai and tends to share the concept of evidence in the philosophical sense, that is, evidence is a set of propositions known to be true. The research object of legal logic is the analysis, evaluation and construction of legal argumentation. Legal argumentation is a purpose-oriented practical argumentation, usually including the interpretative reasoning from a set of legal norms to a set of normative interpretation and fact argumentation from a set of case-facts to a set of evidence. From a (formal) logical point of view, the premises and conclusion of reasoning can only be propositions or statements, not the material itself as physical object. In this sense, fingerprints on guns, bloody knives, and semen-stained clothing are not evidence, but materials including information of evidence, because they are not propositions, but only propositions (from the perspective of formal logic) or statements (from the perspective of informal logic) is it a prerequisite for argumentation. Only propositions that are refined on the basis of the evidence are often called *factual propositions* or *statements*.

However, evidence is known as a true proposition and has not been agreed by legal logicians because, if so, it is equivalent to evidence as premise, as shown in the solid line frame of the set of premises shown in Figure 1. According to Walton (2002, p.201), a piece of evidence is an inference from a set of premises to conclusion. Therefore, Walton's view of evidence is based on evidential reasoning, with particular emphasis on defining evidence based on the inferential relationship between evidence and facts, as shown in the dashed box in Figure 1. We can call the view of evidence-*qua*-inference. Based on this view of evidence, we can well understand the problem of admissible evidence. Moreover,

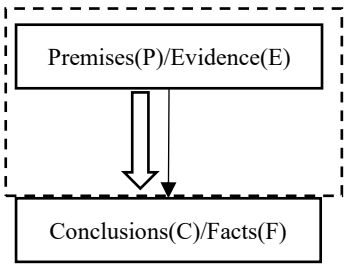

Figure 1 Reasoning & Argument

Walton believes that his concept of evidence is based on the concepts of Bentham's and Wigmore's (cf. Walton, 2002, p.201). In other words, Bentham and Wigmore also hold the view of evidence-*qua*-inference.

Generally speaking, evidential reasoning or fact argumentation in the trial always consists of three stages: production, cross-examination and confirmation of evidence. The common purpose is to help the trier party to determine the admissibility of evidence. How to do it for the trier party? On the one hand, the trivial standard of evidence, that is, legality, relevance, and authenticity is usually adopted in the Chinese law community. However, meeting the legitimacy, relevance, and authenticity is a necessary condition for the admissibility of an evidence, and it is by no means sufficient. Montrose (1954), on the other hand, develops another trivial standard of evidence, namely the criterion of relevance, materiality, and admissibility. In his opinion, each acceptable evidence must meet all three criteria, but of course this is only necessary as well. It is interesting to note that admissibility is not at the same level in both types of trivial evidence standard. In Chinese traditional concept of evidence, there is no strict distinction between admissibility and acceptability, and in Montrose's concept of evidence, it distinguishes between admissibility and acceptability, and acceptability is defined in terms of admissibility. The root of this difference may be closely related to the issue of which procedural and substantive justice are prioritized. Common law systems tend to give priority to procedural justice, while civil law systems, such as the mainland Chinese civil law system, usually give priority to substantive justice. The Chinese judicial system seems to prefer substantive justice. However, we think, discussing this issue has gone beyond the scope of this article.

Obviously, from the definition of inferential relationship between evidence and facts in the three procedural laws in China, since evidence is used as the basis for ruling a case, fact, or case-fact, then we have reason to believe that this view of evidence is related to Walton's, and Bentham's and Wigmore's theories of evidence are essentially the same, that is, all evidence is related to inference, and therefore is also closely related to evidential reasoning or fact argumentation. For this reason, we will develop an argumentative perspective of legal evidence. Then we will discuss it from two dimensions of evidential reasoning (section 3) and fact argumentation (section 4).

3. Evidential reasoning: the reconstruction of legal fact-*qua*-claim

Evidential reasoning refers to the thinking process of deriving a set of possible facts (F) from a given set of legal evidence (E). Its three components are: first, the set of premises(P) or evidence (E), the set of conclusions (C) or facts-*qua*-claim (F) and the inference between P/E and C/F (see the arrow part in Figure 2). According to Ayer (1972), a rational person is one who makes a proper use of reason, and this implies, among other things, that he correctly estimates the strength of evidence (cf. Kelly, 2016). From Ayer's point of view, a reason is an evidence, and the strength of evidence refers to the

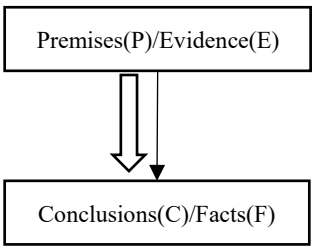

Figure 2 Evidential Reasoning

degree to which a set of evidence supports the facts. The problem of evidential reasoning in the philosophical sense arises from this.

To understand evidential reasoning, one must first clarify the concept of reasoning. The starting point of reasoning is a set of premises, and the end is the set of conclusions. The truth of premises is known, and the truth of conclusion is based on the truth of premises and reasoning form. This view of reasoning is called *deductive reasoning theory.* However, from the perspective of traditional logic, the reasoning represented by the arrow in Fig. 2 includes two types of reasoning: deductive and inductive. Formal logicians usually deny that there exists some inferential relationship between the premises and conclusion of inductive reasoning, and only consider them to be a supportive relationship because inductive reasoning is non-monotonic and defeasibility, and its premises cannot really guarantee its conclusion must be true. From the perspective of informal or inductive logic, the extension of reasoning will be broader. Nowadays the more popular approach is to divide inference into three types: deduction, induction, and conduction. Like inductive reasoning, conductive reasoning is non-monotonic and defeasible, but the key difference is that conductive reasoning is based on deductive and inductive reasoning. Next, we will discuss the relationship between evidential reasoning and these types of reasoning separately.

First, deductive reasoning is formal, and its evaluation criterion is deductive validity, that is, if the premises are true, its conclusion must be true. The evaluation of deductive validity has nothing to do with empirical evidence and the content of reasoning. Deductive logic is a classic logic which recognizes that the true/false two-value principle is universally valid. There are only two propositional semantics concerned: one is true and the other is false, that is, the truth value of a proposition is $\{0,1\}$. Deductive reasoning itself does not make any assertion about the truth value of premise and conclusion. It only evaluates their validity based on the form of reasoning. It is also a necessary, monotonic, and indefeasible reasoning. In other words, in deductive reasoning, once reasoning is valid, no matter what is added to the set of premises, even after adding a premise that contradicts an existing premise, its conclusion must still be true and the reasoning does not become invalid. However, evidential reasoning is always closely related to empirical evidence, and it is non-monotonic and defeasible. The increase or decrease of the elements of the premise set will more or less affect the truth value of the conclusion. There is no necessary reasoning at all. Therefore, the form of evidential reasoning should not and cannot be monotonic, indefeasible and deductive. Traditionally, those attempts to use deductive logic, like syllogistic, propositional or predicate, to explore evidential reasoning have in fact proved to be futile. How can we use non-monotonic and indefeasible deductive reasoning to handle evidence reasoning which is non-monotonic and defeasible?

Second, inductive reasoning is not formal. To be precise, this reasoning is based on empirical evidence in a general sense. The evaluation criterion is inductive strength (sometimes called inductive validity) from the perspective of inductive logic. Specifically, the conclusion may be true if all premises are true, but there is no guarantee that it will be true. Traditional inductive logic is relative to traditional deductive logic,

and its propositional semantics are also truth and falsehood, but the propositional semantics of modern inductive logic has changed significantly. The binary values principle of truth and falsehood is no longer universally valid, and its propositional semantics is probability [0,1], where "1" represents "extremely likely", and "0" represents "extremely unlikely". Contrary to the nature of deductive reasoning, inductive reasoning is non-monotonic and defeasible. In inductive reasoning, even if the set of the existing premises guarantees that the conclusion must be true, in view of the fact that inductive reasoning is non-monotonic and defeasible, its reliability is based on empirical evidence. This is the reason why complete inductive reasoning is not necessary. In other words, as the member of the premise set increases or decreases, the truth value of its conclusion will change within the probability interval of [0,1]. Therefore, the truth of premise cannot actually ensure that its conclusion must be true. Since all evidence is related to empirical evidence, the logical basis of evidential reasoning is obviously inductive. But is inductive reasoning the perfect logical solution for evidential reasoning? Not yet, of course, because informal logicians have given a third type of reasoning — conductive reasoning (Blair, 2016), and this reasoning seems to be more in line with the intuitiveness of evidential reasoning in the practice of the argumentation-based litigation game (ALG).

Third, conductive reasoning is informal and pragmatic. Blair and Johnson (2011) regard it as an overlooked type of defeasible reasoning. On the consideration of the objection set, the conclusion is true. Jin Rongdong (2017) refers to the argument that includes this form of inference as a "balanced reasoning" because the reasoner bases his conclusion on the premises of balancing both positive and negative support. Both deductive and inductive reasoning consider only supporting premises, while conductive reasoning considers both *pros* and *cons* premises. It is worth noting that conductive reasoning is the object of discussion for informal logicians. For informal logician, "reason" is often used to replace "premise" and "claim" is used to replace "conclusion", but there are no other essential differences. In the ALG, when both the suitor and the respondent parties take evidential reasoning, they not only need to weigh the supporting evidence of their own fact-*qua*-claims, but also weigh the attacking evidence that is not conducive to theirs, and then choose the evidence that is most beneficial to their legal rights to the court; the trier party needs to weigh the evidence in support of the fact-*qua*-claims of both parties. Therefore, in the ALG, the reasoning of the suitor party, the respondent party or the trier party is more similar to conductive reasoning.

In litigation, the conflict between evidence is normal, because there will be no dispute over facts without the conflict between evidence and evidence, and no litigation will occur. Not only the trier party needs to deal with the conflict evidence, but also both the suitor and the respondent parties must do it. However, the goals they pursue are different. The purpose of the trier party is to pursue legal fairness and justice, and the goals of the other parties are to maximize their own legal rights, respectively. For different purposes, there is a difference in the evidence selected by the three parties, thus there is a difference in the facts derived. This difference leads to some disputes about fact-*qua*-claim. Therefore, in the same case, there are obviously multiple

strategies to evidential reasoning. This involves strategic maneuvering in the ALG, which we will discuss in detail in Section 4.

In an ALG, how should a player, as the suitor, the respondent or the trier party evaluate conflict reasoning? In addition to the subjective assessment of objective orientation, according to Di Bello and Veheij (2018), there are three relatively objective normative frameworks, i.e., argumentation, probability and scenario, for dealing with conflict evidence. The three frameworks constitute a canonical method of examining, analyzing and weighing evidence in artificial intelligence and law.

First, argumentation framework. Litigation is a kind of game, and it is also a kind of argumentation-based game between the suitor party (S), the respondent party (R) and the trier party (T), we call the Argumentation-based Litigation Game, i.e., ALG (Xiong, 2010, p.75). For this reason, argumentation framework, such as Dung's Abstract Argumentation Framework (Dung, 1995), is the main framework for evaluating conflict evidential reasoning in litigation. For example, when a witness testifies that he saw the suspect at the crime scene, which constitutes a reason, and we can deduce the conclusion "*the suspect is actually at the crime scene*" from this premise. This is an evidential reasoning. However, if the DNA map found at the crime scene does not match the suspect's, this constitutes a reason to attack that conclusion, and then the conclusion "*the criminal suspect is innocent*" is derived. The reasoner needs to make a balance between conflict evidence and their reasoning, and through comparison, pick the most plausible fact set (cf. Di Bello & Verheij, 2018). In fact, this analysis method can be traced back to the Chart Method developed by Wigmore (1913). In artificial intelligence and law, the most popular method is Dung's abstract argumentation framework (Dung, 1995). He distinguishes two kinds of argument relations, i.e., support and attack. Among them, supporting evidence is favorable evidence, and attacking evidence is unfavorable evidence.

Second, probability framework. This is an easy-to-operate framework because the degree that a set of evidence supports a fact is transformed into probability values. From a probabilistic perspective, there are two key issues when dealing with conflict evidence in the ALG: First, how likely is it to specifically assume H given an evidence set E? This is a conditional probability of H given the evidence set E. It is often expressed as $Pr(H|E)$, which translates the degree that a set of evidence support a fact into probability values. Second, this probability change is expressed by the difference between the posterior probability $Pr(H|E)$ and the prior probability $Pr(H)$. On this basis, we only need to perform numerical comparison. Both of these problems can be solved with Bayesian theorem. According to the axiom of probability, it is easy to prove this formula, which shows how, given a set of evidence E, assuming the posterior probability $Pr(H|E)$ of H is based on the prior probability $Pr(H)$ and the factor $Pr(E|H)/Pr(E)$. There is no doubt that the evidence with a high probability value has priority. Once the probability values have been calculated, we can make a choice between evidence by comparing their probability values. Because the adjudicative principle of evidence in civil trial is the principle of advantageous evidence, the probability framework should be more effective in civil proceedings. Of course, this framework can also be used in other forms

of ALG. For example, in the case of the former president of Nanchang University, Zhou Wenbin's bribery and embezzlement, the defendant Zhou's use of the probability framework to balance conflict evidence is a successful example in Chinese criminal ALG. However, not all evidence can be analyzed using a probability framework, because sometimes it is impossible to convert the supportive relationship between evidence and facts into probability values. At this time, the scenario framework to be introduced below can make up for this deficiency to a certain extent.

Third, scenario framework. This approach is based on narrative theory, with scenario analysis as the center. In scenario analysis, it is required to have a coherent description of the so-called facts of a case. Wagenaar, van Koppen, & Crombag (1993, pp.21-43) also refers to this framework as anchored narrative theory. According to Di Bello & Verheij (2018), legal psychology not only helps us understand the role of scenarios in processing evidence, but scenario analysis is also relevant to abduction or inference to the best explanation. Experiments show that false scenarios told in the proper chronological order are more persuasive than true scenarios of events in random order, so scenarios can be misleading. Even so, scenario analysis is still very useful for rational processing of evidence. This is especially true when considering complex cases and their evidence. Di Bello & Verheij present that the following simple scenarios can help us understand a complex case: "The suspect killed the victim on the scenario during the robbery and resisted the arrest, and left a handkerchief." This scenario includes many facts: (1) the suspect cannot be the victim's acquaintance; (2) there are signs that someone broke into the victim's home; (3) a handkerchief that did not belong to the victim was found on the floor. In this case, we obviously cannot evaluate this reasoning with probability values. At this time, scenario framework can come in handy.

In short, the purpose of evidential reasoning is to construct a set of possible case-facts, in which the reasoner should select a minimum and consistent set of evidence through the normative framework, and interpret it coherently to derive a coherent set of possible case-facts that support one's fact-*qua*-claims. The evidential reasoner can be the suitor or the respondent, or the trier. With regard to the nature of the evidence set, minimum is required to reduce litigation costs, while consistency is required to avoid the conflict between evidence.

4. Fact argumentation: the justification of legal fact-*qua*-claim

In litigation, fact argumentation is a thinking process that the arguer starts from a set of facts that he intends, mines a set of possible supporting evidence, and then derives a set of facts from the set of mined evidence. We can distill this thinking process into a "*fact-evidence-fact*" model. However, in both daily and philosophical terms, the term *fact argumentation* seems to be very strange, because, according to our intuition, it seems that only a position, opinion, claim or whatever require an argument, and a fact only requires an explanation. According to Walton (1998, pp.85-86), although reasoning exists not only in argument, but also in explanation, the purposes of reasoning and argument are different. The purpose of argument is usually to resolve an open issue like difference of opinion, that is, to prove a position, viewpoint, or opinion through a

critical discussion, where critical discussion includes at least two possible different standpoints or two parties who have different claims. And the explanation starts with very different assumptions, so that the appropriate assumption of an explanation is that a specific proposition is true, or can be regarded as expressing the occurrence of a fact, the purpose of explanation is to explain why it happened, that is, to explain why the facts exist. In other words, the argument is mainly based on inference and multi-agent interaction, and the explanation is mainly based on causality and single-agent.

In the ALG, however, fact argumentation is reasonable because the case-facts, legal facts, or adjudicative facts do not necessarily have objective truth, in fact they are just a position, viewpoint, or opinion, otherwise here are no disputes about facts in court. Although it is often claimed that criminal trials are designed to search for the truth, from the perspective of procedural justice over substantive justice, as Rescher (1977, p.43) puts it, "the trial is not about the truth of the case, but how to deal with it properly in law. Otherwise why would there be a saying of 'admissible evidence'"? The so-called legal facts in trial are nothing but claims about a fact. In fact, Zhang Baosheng's theory of fact-as-claim is similar to it (Zhang Baosheng, 2017). Since it is only a claim, then an argument is needed to prove it. Even in a civil litigation, since it is the duty of the suitor and the respondent parties to maximize their own legal rights, it is commonplace that evidence that is unfavorable to the parties is not actively presented in court. Therefore, the set of their own case-facts naturally carry a strong own bias. Zhang Zhiming (2002) suggests that a fact contains two meanings: factual existence and factual judgment. Since there is an epistemological problem of factual judgment, the result of judgment is subjective, thus there is no right or wrong, only true or false. Not only that, with the improvement of people's cognitive ability and level or the emergence of new evidence, the set of facts are certainly defeasible. As a result, the issue of fact argumentation is brought up.

Then, as opposed to the suitor's and the respondent's facts, are the trier's facts or the adjudicative facts, necessarily objective? Of course, not. In the Chinese law system, some legal principles such as *two-trial-for-final* and *retrial* shows that adjudicative facts are also defeasible. Taking the criminal trial as an example, according to the principles *"the prosecution proving the defendant's guilty"* and "*beyond reasonable doubt"*, if the prosecution fails to use evidence to prove the defendant's guilty, the defendant must be presumed innocent. The nature of the two principles is clearly reflected in the provisions of Article 162 of the Criminal Procedural Law "Public security organs shall close the investigation and conclude that the facts of a crime are clear and the evidence is certain and sufficient". Among them, "clear facts" means beyond reasonable doubt, and "evidence is certain and sufficient" means that the evidence supports the facts sufficiently. What is "sufficient"? The ideal case is the sufficient condition in the formal logical sense. In most cases, however, a set of evidence may be neither sufficient nor necessary for a set of facts, but only important, because of the problems like inadmissible and illegal evidence. This requires the degree of that a set of evidence supports a fact to approximate the probability value of 1 and it would be better to equal to 1. As for the principle of presumed innocence, please refer

to Article 12 of the Criminal Procedure Law, "No one can be found guilty without the judgment of a people's court according to law." It must be known that the presumption of innocence does not mean that the accused had in fact committed the alleged crime, but based on the available evidence, the defendant cannot be reasonably suspected to be guilty. This series of principles makes it clear that the adjudicative facts in litigation are nothing more than fact-*qua*-claim.

From the perspective of thinking process, if evidential reasoning is a derivation from a given set of evidence (E) to a set of possible facts (F), then fact argumentation is based on a set of expected facts (F) in order to mine a set of supporting evidence (E), and then use evidential reasoning to derive a set of expected facts (F) from the set of mined evidence (see Figure 3). For both parties of the suitor and the respondent in the ALG, the set of expected facts must be very obvious. According to Article 119-3 of the Civil Procedural Law, a specific claims, facts, and reasons must be required for the suitor partier. Among them, the claim is the legal conclusion; the facts are the abbreviation of "case-facts" or "legal facts". In fact, it should be a fact-*qua*-claim, not an objective fact that cannot be doubted or indefeasible (Xiong & Zenker, 2018). In other words, these facts need to be supported by evidence. What legal consequences would there be if evidence could not be provided by the party who should bear the burden of proof? As we know, the principle of the burden of proof in civil litigation is *Actori incumbit onus probandi,* which means "the burden of proof is on the claimant". If the fact-claiming party fails to perform the burden of proof, it will bear the unfavorable legal consequences, that is, its own fact-*qua*-claim is not supported by the trier party, so the relevant claims cannot be guaranteed by law. In criminal ALG, perhaps we can use the words of Scott Turow (1987, pp.1-3) in his novel *Presumed Innocence* to describe the mystery of fact argumentation. He wrote at the beginning:

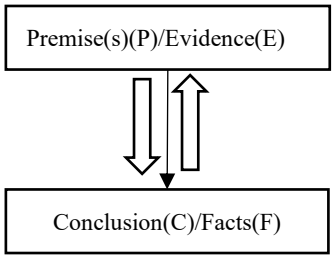

Figure 3 fact argumentation

> "*I am the prosecutor. I represent the state. I am here to present to you the evidence of a crime. Together you will weigh this evidence. You will deliberate upon it. You will decide if it proves the defendant's guilt … you must, at least, try to determine what actually occurred. If you cannot, we will not know if this man deserves to be freed — or punished. We will have no idea who to blame. If we cannot find the truth, what is our hope of justice?"*

This passage is not only a popular expression of the principle of presumed innocence, but also shows that evidence and fact are two different concepts, and that there is a non-monotonic, defeasible argumentation between them. In other words, the prosecution believes that the defendant's criminal facts are fully justified, but the jury may ultimately decide that they are not. Statistics show that in recent years, the guilty conviction rates in the United Kingdom, the United States, and Japan are 80%, 90%, and 99%, respectively (cf. Di Bello & Verheij, 2018). In Japan, although the rate of final convictions is as high as 99%, 1% of cases are still acquitted because of insufficient evidence. Not to mention the low conviction rate in the United Kingdom.

This also fully shows that the so-called case-facts, legal facts or adjudicative facts are just fact-*qua*-claims which are defeasible.

In China, criminal litigation is the responsibility of the people's court, people's procuratorate, and public security organs, and the three cooperate and restrict each other. Among them, the People's Procuratorate is responsible for case review and public prosecution. A case review mainly checks the fact argumentation of a case. Article 171 of the Criminal Procedure Law stipulates: "When the people's procuratorate reviews a case, it must find out whether the facts and circumstances of the crime are clear, and whether the evidence is certain and sufficient ..." This means that reviewing a fact will involve four key issues: (1) the clarity of criminal facts; (2) the clarity of criminal circumstances; (3) the certainty of the evidence set; (4) the sufficiency of the evidence set. To examine whether the criminal facts are clear is beyond reasonable doubt. So, how to determine the criminal facts is clear?

First, it depends on whether there is a set of evidence to support. Any facts not supported by evidence must not be regarded as the case-facts, and even less likely to be adjudicative facts. One might say, isn't there a proof-free fact in litigation? It should be noted that a proof-free fact does not mean it is no evidence to support. What is the definition of evidence? In the Criminal Procedural Law, there are two ways to define evidence – connotative and denotative. According to Article 50 of the Criminal Procedure Law, all materials that can be used to prove the facts of a case are evidence (i.e., the connotative definition), including physical evidence, documentary evidence, witness testimony, victim statements, the defense of criminal suspects, and the confession and defense of defendants, appraisal opinions, investigation transcripts, inspection transcripts, identification transcripts, investigation experimental transcripts, audiovisual materials, electronic data, etc.(i.e., the denotative definition). The connotative definition is principled and instructive and its advantage is that with the development of the times, even if some material evidence that can be used in the set of case-facts is not in the list of extensive definitions, it can be regarded as evidence. Its disadvantage is that it is too vague to operate easily; the advantage of denotative definition is its operability, but the disadvantage is its lack of flexibility and openness. In the Criminal Procedure Law, the two kinds of definition are used for evidence, while the Civil Procedure Law and Administrative Procedure Law only use the denotative definition. In view of the principle and flexibility of the selection and prioritization of evidence in the ALG, we believe that the definition of evidence in the Criminal Procedure Law would be better. Of course, an ideal situation is to develop a uniform code of evidence as soon as possible.

Second, it depends on whether the set of evidence is authentic and sufficient. This actually includes two properties of evidence - authenticity and sufficiency. The authenticity of evidence is the precondition of its admissibility because an inauthentic evidence is definitely not admissible, and the sufficiency is relative to evidential reasoning. The emphasized evidence set is sufficient to support the establishment of the fact-*qua*-claim. On the one hand, regarding the authenticity of evidence, in the daily sense, we may prefer to say "conclusive evidence". So, does "conclusive evidence"

mean the same as "authentic evidence"? Actually, it is difficult to distinguish the meaning of these two words in everyday Chinese language because they are sometimes used as synonyms. However, sometimes it emphasizes differences. As for whether it can be distinguished in the legal sense, however, we have not found any literature to support this view. In addition, what does the sufficiency of evidence mean? This is closely related to evidential reasoning and fact argumentation. As mentioned earlier, if the degree that the evidence set supports the fact is 1, that is, the evidence set is direct evidence, then we say that this type of evidence is definitely sufficient; but if the support degree is less than 1, the evidence is indirect or circumstantial. From the viewpoint of whether the relationship between evidence and facts is support or attack, direct evidence can be divided into direct support and attack evidence, and indirect evidence includes indirect support and attack evidence. For example, in the She Xianglin case, that his wife Zhang Zaiyu returned home is the direct evidence supporting the fact that "Xiang Xianglin did not murder his wife Zhang", and of course the direct attack evidence to the fact that "Xiang Xianglin murdered his wife Zhang".

If we cannot use probability value to characterize evidential reasoning, how can we determine the sufficiency of a set of evidence? One possible solution is to use the scenario framework to make the crime scenario clear. What is scenario? According to Di Bello and Verheij (2018), a scenario is a set of coherent events that have a sequence in time and causality. They argue that a scenario can be used to explain evidence to establish a set of facts. To this end, they put forward three operational requirements for a scenario: (1) a scenario must be plausible and logically consistent; (2) the more evidence there is to explain the scenario, the better; (3) and the more evidence that the scenarios are consistent, the better. Therefore, when the degree the set of evidence supports a fact is less than 1, a scenario must be used to judge the sufficiency of evidence, and even if the degree equals to 1, scenario framework may be required to determine the sufficiency of evidence, because evidential reasoning and fact argumentation is not only non-monotonic and defeasible, but also context-dependent, especially audience-dependent. The scenario to the best explanation is considered an adjudicative rule. This may be one of the adjudicative rules that judges usually use when exercising discretion. In a criminal ALG, the suitor and the respondent parties usually propose competitive scenarios which are generally comparable. This type of scenario assessment framework is particularly important in the criminal trials in Anglo-Saxon law system because juries' fact-ruling on whether the crime is clear is often based on the recognition of scenario rather than argumentation or probabilistic judgment.

All in all, from the viewpoint of ALG, fact argumentation includes two links: one is evidence mining; the other is evidential reasoning. Specifically, the arguer first puts forward or at least one claim, then mines and weighs the relevant supporting and attacking evidence, and finally uses evidential reasoning to prove his own fact-*qua*-claim. This is the complete thinking process of fact argumentation.

5. Strategic maneuvering: the subtle balance in the ALG

Since there is the relationship of evidential reasoning and fact argumentation between

evidence and facts, we should not look at evidence and facts only from a static perspective. This view can obviously be supported by the views of Zhang Baosheng and Ho Hock Lai. According to Zhang Baosheng (2017), evidence and facts cannot be examined only statically because evidence is variable, fragmentary, and representative. Ho Hock Lai (2015) also believes that the concept of legal evidence is neither static nor infallible. Evidence is still like this, then the facts supported by evidence should not be static and absolutely infallible. These characteristics of evidence determine the monotonicity and defeasibility of evidential reasoning.

As mentioned earlier, in the ALG, a fact is nothing but a fact-*qua*-claim. We should both view the evidence and facts from the dynamic perspective. Therefore, we should consider a litigation as an argumentation-based game. It may be a good solution to deal with the issues of evidence and facts under the framework of the ALG. Litigation is an argumentative game between the suitor (S), the respondent (R), and the trier (T) parties (see Figure 4). Therefore, we can consider litigation as a multi-agent ALG (Xiong, 2010, p.75). In a ALG, the players include three parties – S, R and T. The purpose of game is to resolve a specific legal dispute. The rules of game are the current and valid legal norms, the most important of which is procedural laws. The payoff is to persuade intended audiences to accept their claims. Of course, the ultimate goal of the three parties is different in the ALG. Generally speaking, the ultimate goal of the suitor and the respondent parties is to maximize their own legal rights, and the trier party's is to maintain judicial credibility through fairness and justice. However, realizing the ultimate purpose of the three parties must be achieved through of legal argumentation in the ALG and adhere to the principle of law application based on facts and laws.

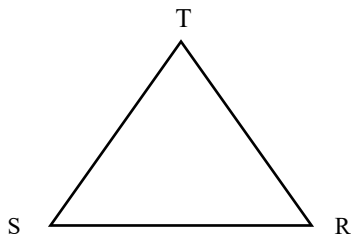

Figure 4 the Argumentation-based Litigation Game

Where there is a game, there must be a strategy. In order to achieve their own goals, the players must perform some strategic maneuvering. Now the key point is how to carry out strategic maneuvering in the ALG? Van Eemeren & Grootendorst provides us with a useful theoretical insight - Pragma-dialectics. According to pragma-dialecticians, difference of opinion is the point of departure for argumentation, resolving it is its purpose, critical discussion is its ideal model, and strategic maneuvering is to reconcile a subtle balance between maintaining dialectical reasonableness and aiming for rhetorical effectiveness. Litigation stems from factual disputes or differences of fact-*qua*-claim, which is the starting point of the ALG. In the ALG, as an arguer, a player (S, R, or T) must reconcile a subtle balance between maintaining reasonableness and aiming for effectiveness.

How to maintain dialectical reasonableness? Van Eemeren (2018, pp.58-61) proposed ten principles of critical discussion, called the "ten commandments", namely, the *Freedom Rule*, the *Obligation to Defend Rule*, the *Standpoint Rule*, the *Relevance Rule*, the *Unexpressed Premise Rule*, the *Starting Point Rule*, the *Validity Rule*, the *Argument Scheme Rule*, the *Concluding Rule*, and the *Language Use Rule*. There is no

doubt that these ten principles are equally applicable to the ALG (cf. Feteris, 2017, ch.10). For example, the Freedom Rule requires that both parties must not prevent the other party from proposing a position or challenge, which is the embodiment of the principle that *all are equal before the law*. As another example, the Obligation to Defend Rule requires that if a party who proposes a claim is required to defend it, he will be obliged to do it, which is consistent with the allocation principle of the burden of proof in civil litigation, which is *the burden of proof is upon the claimant.* Of course, the most important rule for maintaining reasonableness should be the Validity Rule, that is, the reasoning put forward as logically valid reasoning in arguments. It is emphasized that the conclusion must be logically derived from its premise(s). What is logically valid? According to van Eemeren (2018, p.60), reasoning that is in argumentation explicitly and fully expressed may not be invalid in a logical sense. However, logical validity usually refers to deductive validity. As mentioned earlier, the logical basis of evidential reasoning and fact argumentation cannot be deductive. Thus, if the validity rule in pragma-dialectics is interpreted as the deductive validity rule and transplanted into the framework of ALG, it will inevitably lead to problems of soil and water rejection. Based on the previous analysis, one useful possible approach is to broaden the meaning of validity, that is, to extend the validity in the sense of formal logic to the goodness of argument in the sense of informal logic or argumentation studies (Xiong & Du, 2017).

How to aim for rhetorical effectiveness? In order to convince the intended audience to accept the arguments put forward by the arguer, van Eemeren (2018, p.112) develops a triangle of strategic maneuvering: the first angle is to select from the topical potential; the second angle is to adapt to the audience demand; the third angle is to exploit the presentational devices. Specifically, in the ALG, strategic maneuvering includes three perspectives: (1) S-perspective. First S must select a subset of facts-*qua*-claim from the set of all possible facts-*qua*-claim to support their own legal claims; and then adapt to the intended audience like T or even R; finally exploit the presentational devices that are conducive to persuading them. (2) R-perspective. First, R must select a set (not subset) of possible facts-*qua*-claim based on the set of S's; then carry out the argument planning according to the characteristics of the intended audience, namely T and even S. (3) T-perspective. First, T must select a (sub)set of possible adjudicative facts based on S's or R's sets of facts-*qua*-claim; then adapt to the demand of the intended audiences, i.e., the suitor party, the respondent party, and even other potential intended audiences, such as judge in higher courts and the public; Finally, choose presentational devices that will help convince the intended audience.

In order to reconcile a subtle balance between dialectical reasonableness and rhetorical effectiveness, the hybrid formal theory based on arguments, stories and evidence developed by Floris Bex (2010, p.83) may be a useful theoretical tool. In this regard, Allen and Stan (2013) also held the same view, "the fact-finders should consider the stories of the two parties competing with each other and determine their *pros* and *cons*; in some cases, they do the incident based on the parties' evidence and arguments come up with your own explanation". According to Bex (2010, pp.33-34), there are usually two possible approaches for dealing with evidential reasoning:

The first is the argument-based approach. Arguments are constructed by performing consecutive reasoning steps, starting with an item of evidence and reasoning towards some conclusion. Each of these reasoning steps has an underlying evidential generalization of the form "*e is evidence for p*" that justifies the step from premises to conclusion. Hence, reasoning in this way can be characterized as evidential reasoning. Reasoning with arguments is dialectical, in that not only arguments for a particular *probandum* but also arguments against the *probandum* and other kinds of counterarguments are considered. Finally, argumentative reasoning has been called atomistic because the various elements of a case (i.e. hypotheses, evidential data) are considered separately and the case is not considered "as a whole" (Bex, 2010, p.33). In other words, this approach is local, inferential, argumentative, and microcosmic.

The second is the stories-based approach. In the ALG, in order to achieve their own goals, S, R and T have to tell their own stories. Of course, such stories must be based on evidential reasoning and fact argumentation. For S and R, the evidence that is not conducive to the facts-*qua*-claim of the party will never be actively presented to the court, and for T, the inadmissible evidence cannot be used as the basis for ruling a case-fact. The story-based approach involves constructing stories about what (might have) happened in a case that explain the evidential data. Reasoning with stories, which detail the course of events before, during and immediately after the crime, can be characterized as causal reasoning; the relations between the various events in a story and between the story and the observations (i.e. evidential data) can be expressed as causal generalizations of the form "*c is a cause for e*". This approach also has a dialectical component in that the different stories about the case are compared according to the amount of evidential data they explain and their internal coherence. The story-based approach has also been called holistic (as opposed to atomistic), because the various elements in the case (i.e. hypotheses, evidential data) are considered as a whole and the elements receive less individual attention (ibid, pp.33-34). In short, the approach is holistic, causal, dialectical, and macroscopic.

Both the argument-based approach and stories-based approaches have their own advantages. On the basis of integrating these two approaches, Bex (2010, p.83) provides a hybrid formal framework. In this framework, a story is modeled as a simple causal network. In the case, these stories explain this explained variable from a causal link, so they can be seen as possible hypotheses about what happened. Evidence-*qua*-material is expressed as a single proposition, and the state and events in the stories can be inferred through evidential reasoning based on this evidence. Therefore, the difference between evidence E and event E* is preserved, and a single piece of evidence can be inferred by attacking the inference from E* to E. The criteria for evaluating and comparing stories are plausibility, consistency, and completeness. A story with the above three natures at the same time is a good and coherence story, which can be considered as reconciling a subtle balance between dialectical reasonableness and rhetorical effectiveness.

6. Conclusion

In the end, we have to say that the storytellers are definitely those screenwriters and directors. Let us take the case of Liang Jun's poisoning case in the episodes 9-11 of the TV series *the Legend of White Snak*e (Zhi Lei, 2019) as an example to show the strategic maneuvering of evidential reasoning and fact argumentation in the ALG. The nine-tailed fox demon Hu Kexin designed to poison Liang Jun and tried to frame doctor Xu Xian. Hu first casted a spell to make Liang suffer from angina, and then recommended Liang to see doctor Xu in Ji Shitang. Because Xu was not in the hospital when Liang went, Xu's wife Bai Suzhen gave him a pulse. Seeing Bai as beautiful as a flower, Liang's heart suddenly rose, so when Bai took the pulse for him, he took the opportunity to take liberties with her. In order to punish Liang, Bai added some laxatives when he prescribed the prescription. Xu happened to be back at this time. When he personally took Bai's prescription for Liang grabbing medicine and found that Bai had added laxatives, Xu replaced the symptomatic medicine, but Liang died after returning home to take the medicine. Later, the suitor, the respondent, the trier, and other witnesses, made full use of evidential reasoning and fact argumentation, and told a series of stories in their favor: (1) The suitor believed that after taking the prescription medicine prescribed by Bai, Liang returned home and died of poisoning, so Bai should be held criminally responsible for Liang's death. (2) The respondent Bai did not hope Xu to be implicated, so she took all the responsibilities. Her argument was that since she prescribed the prescription, she should take full responsibility for it. (3) As a witness, Xu believed that Bai added only a little laxative, and he replaced them when he grabbed the medicine. According to medical theory, Liang should not be poisoned after taking the medicine, so Xu proposed to test the medicine in person, and successfully proved that Liang was poisoned, so the prescription issued by Bai has nothing to do with it. (4) Witness Hu further testified that she used Liang's drug residue to testify Bai, saying that Bai had added deadly hindu datura to the medicine, resulting in Liang poisoning and death. (5) In order to protect Bai, Xu said that although Bai had prescribed the prescription, he had taken the medicine, so he claimed that he should bear all the responsibilities, and was subsequently put to death by Liang Jun's father Liang Xiangguo. (6) Appointed by Hu, someone is carrying out the murder of the key witness Lv Yi, who is Liang Jun's little wife, Bai's sister Xiao Qing rescued Lv. And then she testified that she saw the Hu sent someone to buy all the foreign gold flowers in all medical facilities in Lin'an City and took the remaining hindu datura. The flowers are hidden under the peach trees behind the rockery, so the murderer is really Hu. Although these stories are written by the screenwriter and the director, they show the goal of ALG is to maintain a subtle balance between reasonableness and effectiveness through a series of arguments and stories, and the wonderful use of evidential reasoning and fact argumentation.

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