ARGUMENTATION SCHEMES: THE BASIS OF CONDITIONAL RELEVANCE


The object of this investigation is to use some tools of argumentation and AI to provide a new approach to the analysis of relevance as a concept of rationality that is applicable to evidence law. The project builds on recent work in three fields: argumentation, artificial intelligence (AI), and evidence law. The two main tools are argumentation schemes and argument diagrams built with schemes. The argumentation schemes most typical of evidence law represent presumptive reasoning of a kind different from deductive reasoning or inductive reasoning of a standard Bayesian kind. Schemes represent arguments based on Toulmin-style warrants expressing generalizations that are subject to exceptions of a kind that cannot always be predicted in advance. The study of schemes falls under the category of argumentation heuristics used, for example, in a common law trial. It is shown how such schemes can be fitted into argument diagrams that can be used to represent the chaining of reasoning in a mass of evidence in a case. Diagrams resembling Wigmore charts can be constructed with pencil and paper, and even better using computer software available at no cost on the internet. It is shown how a chain of reasoning constructed with argumentation schemes using an argument diagram is the technical basis of how logical relevance determinations should be made and assessed in a given case. Basically, if the argument chains forward to the ultimate conclusion to be proved in the case (the ultimate probandum), it is relevant.

Matters discussed include the relationship between logical relevance and the legal notion of relevance found in trial rules, relevance as defined in the Federal Rules of Evidence, the historical background of the notion of relevance, and fallacies of relevance. The analysis leads up to the central problem of conditional relevance, and it is shown how this problem relates to the logical problem of arguments with missing premises or conclusions (traditionally called enthymemes in logic). Conditional relevance has often been criticized as an obscure notion or even a “myth”, and its application by the courts has been cautionary and restricted to a narrow range of cases. It is shown that conditional relevance is not only very important to making sense of relevance generally as a useful notion of rational argumentation, but it can be given a highly precise analysis by the logical tools mentioned above. However, despite the precision of the solutions to specific problems made possible by the tools, the discussion of relevance in the paper is wide-ranging. The intent is to suggest a new approach to a group of problems central to evidence law, an approach that offers hope for the project of revealing the clear and precise model of rational argumentation that underlies the Federal Rules of Evidence.

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1 This paper is based on my current research. Basic methods of argumentation have been applied to cases in my recent book (Walton, 2002). An article (Walton, 1999) has defined and analyzed logical relevance as a tool for argumentation theory. I have been at work for a decade on a book *Relevance in Argumentation* (in press, Erlbaum) that develops a broad theory of relevance covering argumentation generally. The last chapter of that book is mainly on legal relevance, but there was not enough space in the book to go into legal questions in any depth. In this paper I give an overview of these developments, stressing the methods that are most likely to be interesting to those working in evidence law. I would like to thank the Social Sciences and Humanities Research Council of Canada for a grant that helped support this work.

2 Heuristics are problem-solving strategies often called rules of thumb or common sense judgments. They are based on accessible but loosely applicable data (Pearl, 1984, vii).
1. Argumentation Schemes

Argumentation schemes represent patterns of typical human reasoning of a kind found in everyday speech. Many of them are presumptive in nature and are based on plausible reasoning. But these tools are used in quite a different way in recent argumentation work, a way that can be called pragmatic or dialectical (or sometimes pragma-dialectical). Schemes are evaluated not semantically, as forms of argument abstracted from a conversational context, but as presumptive arguments that need to be judged by asking critical questions in a dialogue. Such arguments are defeasible, meaning they are subject to defeat as new evidence comes in. They hold tentatively, on a balance of considerations, in which there is evidence on both sides of a case. Argumentation schemes look, at first glance, more or less like the deductive and inductive argument forms that have long been the main logical tools. The tendency in the past has been to emphasize deductive and inductive forms of argument, and to ignore arguments that do not fall into either category, or even to classify them as fallacious (Hamblin, 1970). However, many arguments of this third kind are reasonable, under the right conditions. For example, appealing to expert opinion during an argument could be reasonable if the field of the expert is appropriate, and other conditions are met. Such an argument could be represented by the argumentation scheme for appeal to expert opinion.

**Argumentation Scheme for Argument from Expert Opinion**

**Major Premise:** $E$ is an expert in subject domain $S$ containing statement $A$.

**Minor Premise:** $E$ asserts that $A$ (in domain $S$) is true (false).

**Conclusion:** $A$ may plausibly be taken to be true (false).

One might try to “deductivize” the reasonable instances of appeal to expert opinion, by taking the major premise as a conditional stating categorically that if an expert says $A$ is true, and $A$ is the subject domain $S$, then $A$ has to be true, without any logical possibility of doubt. Such an assumption is unrealistic as applied to most cases of expert testimony, however. It is often a serious mistake to treat experts as omniscient. Indeed, it is just this tendency to treat an expert as an authority whose pronouncement cannot be doubted that is the basis of the fallacy of appeal to authority. Experiments in social psychology, most notably the one conducted by Stanley Milgram (1974), showed that the tendency to treat perceived experts as authorities whose word should not be questioned is a powerful psychological force.

The best approach (Walton, 1997) is to treat appeal to expert opinion as a defeasible form of argument that can and should be questioned before resting too much weight on it. On this approach, such an argument should be evaluated on a balance of considerations in a dialogue between two parties, called the proponent and the respondent. When the proponent puts forward an appeal to expert opinion, the respondent can ask any one of the following six basic critical questions (Walton, 1997, p. 223).

1. **Expertise Question:** How credible is $E$ as an expert source?
2. **Field Question:** Is $E$ an expert in the field that $A$ is in?
3. **Opinion Question**: What did $E$ assert that implies $A$?
4. **Trustworthiness Question**: Is $E$ personally reliable as a source?
5. **Consistency Question**: Is $A$ consistent with what other experts assert?
6. **Backup Evidence Question**: Is $A$’s assertion based on evidence?

The evaluation of the argument should then proceed on a burden of proof basis. The proponent who originally put the argument forward is obliged to support it by providing an adequate answer to the question the respondent chose to ask. Otherwise the original argument defaults. But if the proponent does provide such an answer, the argument tentatively stands until the respondent asks another critical question.

The idea is that there is a whole class of common arguments that are neither deductive nor inductive, but can be represented by argumentation schemes with matching critical questions. Perelman and Olbrechts-Tyteca (1969) offered many examples of these defeasible forms of argumentation that shift a weight of presumption on a balance of considerations in a dialogue. Hastings (1963) developed the first systematic modern taxonomy of these argumentation schemes. The most comprehensive listing of argumentation schemes is that of Kienpointner (1992). His listing includes deductive and inductive, as well as presumptive argumentation schemes. The presumptive schemes treated in (Walton, 1996) include argument from sign, argument from example, argument from commitment, argument from position to know, argument from expert opinion, argument from analogy, argument from precedent, argument from gradualism, and the slippery slope argument. It might also be noted that there is an argumentation scheme for argument from testimony, also called appeal to testimony.

**Appeal to Witness Testimony**

**Position to Know Premise**: Witness $W$ is in a position to know whether $A$ is true or not.
**Truth Telling Premise**: Witness $W$ is telling the truth (as $W$ knows it).
**Statement Premise**: Witness $W$ states that $A$ is true (false).
**Warrant**: If witness $W$ is in a position to know whether $A$ is true or not, and $W$ is telling the truth (as $W$ knows it), and $W$ states that $A$ is true (false), then $A$ is true (false).
**Conclusion**: Therefore ( defeasibly) $A$ is true (false).

**Five Critical Questions Matching the Appeal to Witness Testimony**

**CQ1**: Is what the witness said internally consistent?
**CQ2**: Is what the witness said consistent with the known facts of the case (based on evidence apart from what the witness testified to)?
**CQ3**: Is what the witness said consistent with what other witnesses have (independently) testified to?
**CQ4**: Is there some kind of bias that can be attributed to the account given by the witness?
**CQ5**: How plausible is the statement $A$ asserted by the witness?

The warrant (Toulmin, 1958) has been inserted above to show appeal to witness testimony is based on a defeasible rule, meaning that it holds subject to exceptions that
may arise in a particular case, once new evidence comes in during an investigation or trial that defeats the argument or raises questions about it. Thus the argument only connects the premises to the conclusion in a presumptive way. If the premises are accepted, then a presumption is raised in favor of the conclusion also being tentatively accepted as well. But if a critical question is asked, the presumption in favor of the conclusion is defeated, or put on hold, until the question has been given a satisfactory answer. A defeasible argument is best evaluated in a dialogue format with two sides, the pro and con.

Deductive and inductive forms of argument can be very important in reconstructing legal argumentation in some cases, but in many cases, the arguments are of a third kind, called presumptive or plausibilistic. The classic example of an argument based on plausibility was attributed by Aristotle to a sophist called Corax (Rhetoric 1402a17 - 1402a28). There was a trial concerning a fight between a smaller and visibly weaker man and a bigger and visibly stronger man. The smaller man argued that it is implausible that he would have attacked the other man who, as anyone can see, is bigger and stronger. The clever thing about the argument is that the other man turned it on its head. He argued that it is implausible that he, the visibly bigger and stronger of the pair, would assault the other man, knowing full well how bad that would look in court. Another good example of argumentation based on plausibility is a case outlined by Wigmore (1935, p. 43). The funds of an estate of orphans were in the hands of an administrator, who was sued for a deficit. His plea was he had paid the money away in discharge of a bond. He produced a witness who testified that in his presence the defendant had paid the money in silver, bringing it on foot from his home several miles away. On further questioning he specified the details of distance and amount. Counsel for the plaintiff, having figured out how much the normal amount of dollars would weigh in silver, found that it reached some hundreds of pounds. When he was asked, how could such a weight be carried on foot, the witness broke down. His testimonial evidence was false, and the verdict was for the plaintiff.

This case shows how cross-examination can reveal the implausibility of a claim made by a witness. The claim sounds plausible enough on the surface. But once examined carefully, its plausibility is thrown into doubt. The basis of the counter-argument is common knowledge about ordinary ways of doing things and normal human capacities. Carrying a bag of coins weighing hundreds of pounds for several miles on foot is a hard task that the average person would not be capable of under normal circumstances. It is implausible that a person would normally even attempt to carry out such a task without some unusual circumstances that might explain why. Many of the most common argumentation schemes, like argument from expert opinion and appeal to witness testimony, are in most cases best seen as representing plausible arguments.

2. Argument Diagramming

One of the first things to notice is that recent argumentation theory looks like it uses tools that are already familiar as methods in both evidence law and traditional logic. For example, argument diagramming is already used in both fields (Friedman, 1986; Schum, 1994; Copi, 1982; Hurley, 2000). The technique is perhaps best known in evidence law through Wigmore’s use of it in his evidence charts (Wigmore, 1931). The notion of a

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3 According to Gagarin (1994, p. 50), the bigger and smaller man case was first brought forward by two sophists, Corax and Tisias, who lived around the middle of the fifth century B.C.
chain of argumentation, as defined above, is best represented by an argument diagram. It may be helpful just to see how the argument diagramming technique can use schemes to represent argumentation typical of the kind found in legal evidence.

In an argument diagram representing a mass of evidence in a legal case, there is always a final conclusion or ultimate probandum representing the claim that is to be proved or to have doubt cast on it. This final conclusion is supported by means of a chain of argumentation argument that usually has an earlier conclusion as one of its premises. A set of premises can go together to support a conclusion in two ways that need to be distinguished. One way is that the argument can have the structure called linked. In a linked argument, each premise is dependent on the other(s) to support the conclusion (Freeman, 1991). In a linked argument, if one premise is deleted, the other offers much less evidential support for the conclusion than the two do together. Linked premises are often joined to a conclusion by a known argumentation scheme, as will be shown in the example below. The other way has a structure called convergent. In a convergent argument, each premise provides independent evidential support for the conclusion. Even if one premise is deleted, the other still offers the same evidential support for the conclusion it did before. In a convergent argument, each premise can be seen as a separate argument for the conclusion, an argument that can stand on its own. Another factor to mention is that many legal arguments are based on unstated premises, or even unstated conclusions that need to be made explicit in order to show how the conclusion was arrived at from the given evidence. Arguments with such unstated premises or conclusions are called enthymemes in traditional logic.4

Consider the following example, which we will call the forensic case. Suppose that Vic was choked to death by an assailant and some bits of flesh were found under his fingernails. DNA testing showed that the flesh was that of Sam. An expert witness, the medical examiner Emily, testified in court that DNA testing showed that the flesh matched Sam’s. There was also eyewitness evidence. A bystander Ed, who had a clear view of the exit from the building where the homicide took place, testified that he saw Sam leave the building just around the time of the crime. In such a case, there is a mass of evidence on the prosecution side, and the argument from expert opinion is one argument in it connected to others. The network of argumentation on each side in the trial is a mass of evidence made up of a connected sequence of argumentation. A Wigmore-style evidence chart or argument diagram could be drawn up to represent the argumentation on each side. But a very simple, generic sort of argument diagram can be drawn up to illustrate very simply how such a technique proceeds. Let’s begin by listing the statements in the case that represent the premises and conclusions in the chain of argumentation in the case.

(A) Emily says that the flesh found under Vic’s fingernails matches Sam’s DNA.

4 The term ‘enthymeme’ originally may have meant something quite different. (Burnyeat, 1994), noting that the Aristotle wrote Prior Analytics (70a10) that an enthymeme is an incomplete (ateles) sullogismos from plausibilities or signs, but doubted that Aristotle wrote the word ateles in the original manuscript. Burnyeat, following several earlier commentators, hypothesized that what Aristotle really meant by ‘enthymeme’ is a plausibilistic argument of the kind he treated in the Topics and Rhetoric. This type of argument is based on a warrant that is defeasible, and thus corresponds to what is now called a presumptive argumentation scheme. Thus there is a case to be made that the term ‘enthymeme’, in the original Aristotelian meaning, refers to presumptive argumentation schemes, not to incomplete arguments.
(B) Emily is a forensic expert in DNA testing.
(C) It is plausible that the flesh found under Vic’s fingernails matched Sam’s DNA.
(D) Such a DNA match would indicate that Vic had grasped Sam’s flesh leaving traces under his fingernails.
(E) Vic had grasped Sam’s flesh leaving traces under his fingernails.
(F) Witness Ed says he saw Sam leave the crime scene building.
(G) Ed had a clear view of the exit from the building.
(H) Sam killed Vic.

\[ \text{Figure 1: Argument Diagram of the Forensic Case} \]

The ultimate conclusion, or so-called ultimate probandum is (8). The argument from expert opinion rests on premises (1) and (2), and they lead to conclusion (3). This is a linked argument. (3) combines with additional premise (4) in another linked argument that leads to conclusion (8). (4) is an unstated premise that needs to be added if the chain of argumentation is to be identified. (3) is an unstated conclusion that needs to be added.
in to show how the two initial premises lead to a subconclusion that in turn functions as premise in an argument that leads to (8). This whole segment of the argument represents the circumstantial forensic evidence. The remaining segment of the argument represents the eyewitness testimony. Premises (6) and (7) taken together form a linked argument that also leads to conclusion (8). Thus the two segments, when taken together, represent a convergent argument that leads to (8). A generic argument diagram that represents the whole chain of argumentation is drawn below.

Much more could be said about the argumentation in the forensic case if we probed more deeply into further implicit assumptions that can be extracted from it. What is most important to notice about this case is how each argument forms a structure that is part of a longer chain of reasoning aiming at the ultimate probandum in the case.

Figure 2: Araucaria Diagram of the Forensic Case

Argumentation schemes are important tools that enable one to construct such a chain by filling in inferential links connecting statements in the data to the ultimate probandum. There are now software tools available to help with argument diagramming. Araucaria is the most useful of these tools, as it contains argumentation schemes that can be used in the construction of the argument diagram. It aids a user to diagram an argument using a simple point-and-click interface. Once an argument has been analyzed it can be saved in a portable format called AML, Argument Markup Language, based on XML.
constructing an *Araucaria* diagram, the user must put the text of discourse into a text document, and then insert it into *Araucaria*, where it will appear in the box on the left. Then she can highlight each statement, and a circled letter representing each statement will automatically appear in the box on the right. The user can then draw in arrows from each premise to the conclusion it supports. *Araucaria* automatically produces an argument diagram in the right box. All arguments initially appear as convergent, but if the user wants to represent any of them as linked, she can do so. The outcome of representing the chain of argumentation using *Araucaria* in the forensic case is shown in figure 2.

Figure 3: Full Text *Araucaria* Diagram of the Forensic Case

*Araucaria* also has several other features that are useful. It can, at the click of a button, transform the initial diagram with numbered premises and conclusions into a full text diagram. It also supports argumentation schemes, and provides a user-customizable set of schemes with which to analyze arguments. The schemes can be marked on the diagram,
showing how a given set of premises supports a conclusion based on a given scheme. Both features are illustrated in the diagram in figure 3 of the forensic case. On the computer screen, the shaded area surrounding the argument leading from A and B to C is colored green. The shaded area surrounding the argument leading from premises F and D to conclusion H is colored red. Each color indicates a specific argumentation scheme, and indicates how that scheme has been applied to a particular argument. Finally, there is one other feature that should be noted. It enables the user to write in unstated premises and conclusions needed to complete a diagram, and it marks these statements in a different color on the diagram. To make the presentation simpler, we have not used this feature in the forensic case above, and treated all the statements in the same way. But this feature should be noted, because it is important that unstated premises or conclusions attributed to an argument should be clearly distinguished from explicit ones. This feature will be important in the discussion of enthymemes in section 7 below.

Now that argument diagramming has been explained, the question is how it can be applied to determinations of relevance. The problem is that in a typical case at trial, there is a large mass of evidence on both sides, and any particular argument will be relevant as evidence only if it fits into the mass of evidence on one side. How some bit of local evidence is relevant in the mass of evidence in a particular case, and how such a relevance fitting should be represented in an argument diagram, are matters that have been well explained by Schum (1994, pp. 75-86), using the case of Sacco and Vanzetti. A glimpse into how it works can be gotten by considering a version of Schum’s diagram (p. 76) of how one bit of evidence is judged to be relevant.

Figure 4: Argument Diagram of the Sacco and Vanzetti Case

According to Officer’s Connolly’s story, when Sacco was arrested, he moved his hand toward his coat as though he was reaching for something in it. It was found that Sacco was carrying a gun in his coat. The prosecution argued that Sacco’s action was evidence
of his being conscious of having committed the murder. This inference is, of course, a defeasible one. It can well be classified as an instance of abductive reasoning, or inference to the best explanation. There could be other explanations of the supposed action (Schum, 1994, p. 77). For example, Sacco may have been reaching for the weapon in order to hand it over to the officers. Or may have simply been itchy and wanted to scratch. This case shows how in a real case at trial, a bit of evidence can be shown to be relevant because it fits in as part of a large diagram picturing the mass of evidence in the case on one side. In this instance it is on the prosecution side.

This case is typical, because although there is a weak and defeasible bit of evidence, Connolly’s testimony is arguably relevant viewed within the line of argumentation of the one side. Is it really relevant? Well, in the Sacco and Vanzetti case, a classic case of wrongful conviction, this bit of evidence in retrospect looks weak and misleading. It is a case of defeasible argumentation gone wrong, closer perhaps to logical fallacy than to logical reasoning. Putting these issues aside, however, it is a typical case where there is some bit of evidence, weak and questionable by itself, that fits into a chain of argumentation such that, if the premises in it are true (or plausible), the chain does connect up with the ultimate probandum. As Schum pointed out, however (p. 81), the diagram by itself will persuade “hardly anyone” of the relevance of this bit of evidence. What is needed is a logical inference joining each point to each next point in the sequence. For each link in the chain of inferences one needs the ground or reason that entitles the taking of such a step of inference, based on its “warrant” or “generalization” (p. 81). In a nutshell, that is how argument diagramming works as a tool to help evaluate relevance in a particular case. Each line from a set of nodes (representing a set of statements that are premises or conclusions in a chain of argumentation), represents a warranted inference.

The notion of chaining forward is fundamental to relevance. Suppose we take an argument like one of the form above, and chain it to another argument, which could have the same form or a different form. Two arguments can be chained together, meaning that the conclusion of the first reappears as a premise in the second. If a third argument were chained to the second, then ipso facto, that third argument would be chained to the first. The subarguments that make up the chain could be deductive or inductive, in some instances. But in legal argumentation concerning circumstantial and testimonial evidence, the arguments are typically based on plausibility. Jeremy Bentham was an important contributor to the subject of analyzing relevance in argumentation, particularly in one important respect. He analyzed logical relevance as a chaining process in which a series of logical inferences are chained together, and aimed toward proving an ultimate probandum. The conclusion of one argument in such a chain becomes a premise in the next. Bentham (1962, vol. 7, p. 2) can be cited as a key predecessor in applying these logical notions to legal argumentation. His remarks on evidence foreshadowed the notion of chaining of reasoning that has now become so central to AI. He and Locke (Twining, 1985) saw plausibility, or as it was translated from the Greek, “probability”, as a

5 The notion of warrant derives from Toulmin (1958). Twining (1999) has shown the importance of generalizations as warrants in legal reasoning, calling them “necessary but dangerous” (p. 356). Reasoning based on generalizations can go wrong or be misleading in various ways (p. 357). The fallacy of hasty generalization is the traditional term for such faults.
fundamental notion needed to grasp the kind of reasoning that is so common in evidence law.

3. Historical Roots of the Notion of Relevance

The origins of the notion of relevance are to be found in Greek rhetoric and dialectic. The rhetorical root is the notion of \textit{stasis}, generally attributed to Hermagoras of Temnos (Hohmann, 1989, p. 172). Hermagoras was a professional teacher of rhetoric who lived about the middle of the second century B.C. He was the author of a handbook on speechmaking that was lost, but had an influence on many subsequent rhetorical manuals. The central notion was that any speech must have some controversy it was meant to address, or problem it was meant to solve. We might call it an “issue”. In Greek it was called the \textit{stasis} of the speech, or in Latin, the \textit{status}. An argument was held to be relevant in a speech only if it can be fitted in as part of a chain of argumentation aiming at this \textit{stasis}, or issue to be resolved. This notion of relevance was rhetorical. A speaker who uses irrelevant argumentation might fail to rhetorically persuade his audience. But the same notion of relevance also has logical implications. We use ‘logical’ here in a sense implying objective standards that a correct argument should conform to. Sometimes such standards are called normative, as opposed to rhetorical, where the latter term refers to the psychological impact of a speech on an audience. A speaker who wanders off the topic, distracting the audience with matters that are exciting but not relevant, could be normatively criticized for failing to address the issue. The wandering could be a logical fault of her/his argumentation. Even if the audience is rhetorically persuaded by it, the argument could still be logically faulty. Indeed, the red herring tactic is the sort of trick a sophist might use, and is known in logic as a fallacy.

Aristotle was the first (known author) to postulate logical irrelevance as a fallacy, or fault of logical argumentation. Parallel to the rhetorical notion, an argument can be viewed normatively as aiming at an ultimate conclusion, what is called an ultimate \textit{probandum} in law. This is a normative requirement because it stipulates where an argument ideally should aim. If it leads somewhere other than to this designated conclusion, Aristotle wrote (\textit{Topica} 162a13 - 162a16), the argument commits the fallacy of \textit{ignoratio elenchi} (ignorance of refutation). To grasp the intent of the definition, it is best to look at a literal translation.\footnote{6} When the argument stated is a demonstration [\textit{apodeixis}] of something, if it’s something other than that leading to the conclusion, it will not be a syllogism about that thing. Then Aristotle remarked (162a16-162a18) that if there appears to be such an inference, it will be a sophism (fallacy) not a genuine demonstration. This remark is quite a clear statement of what irrelevance is as a logical failure, I believe. It tells us that, for Aristotle, a good (successful, correct) argument is one that leads to a designated conclusion. Thus if it leads somewhere else, that is a failure, fault or logical fallacy.

\footnote{6} Craig Cooper, a colleague in the classics department, made this literal translation for me in December, 1995.
a failure of “demonstration”, which Aristotle evidently saw as a deductive type of argumentation. The definition would be quite a bit more useful, especially as applied to legal argumentation, if it could encompass inductive arguments, and even presumptive arguments that are neither deductive nor inductive. However, as Aristotle saw the fallacy, it is not purely a formal fault. For on his account, an irrelevant argument can be fallacious even if it is deductively valid. It can be an ignoratio elenchi, in his terms, even if it is a demonstration of its conclusion. Indeed, for Aristotle, its validity is part of its being fallacious. What else is involved then? To get an idea, the best thing is to look at an example.

A leading example of this fallacy in the logic textbooks, interestingly, a legal one, illustrates it very well. The following version of the example is quoted from (Copi, 1982, p. 110), one of the most widely used logic texts.

The Horrible Crime of Murder Example

In a law court, in attempting to prove that the accused is guilty of murder, the prosecution may argue at length that murder is a horrible crime. He may even succeed in proving that conclusion. But when he infers from his remarks about the horribleness of murder that the defendant is guilty of it, he is committing the fallacy of ignoratio elenchi.

This example fits Aristotle’s account of the ignoratio elenchi fallacy very well. What makes the prosecutor’s argument fallacious, on this account, is that it is “something other than leading to the conclusion” that is to be proved. The prosecution in a criminal trial has a burden of proof. It is to prove that the defendant is guilty of the charge, in this case murder. Arguing at length that murder is horrible crime, we can easily imagine, could be something other than leading by argumentation to this conclusion. It comes under the heading of “irrational means of persuasion” (Twining, 1999, p. 359) like telling a story that evokes powerfully suggestive emotions “but is irrelevant to the argument”.

Thus one can see how the example has a rhetorical dimension as well as a logical one. The emotional diversion about the horribleness of murder could have a strong suggestive psychological impact on a jury. Copi (1982, p. 111) described this psychological process.

If the prosecution has given a sufficiently moving picture of the horribleness of murder, the jury may be so aroused, such horror and disapproval may be evoked in them, that they will bring in a verdict of guilty more swiftly than if the prosecutor had “merely” proved that the defendant had committed the crime.

In a psychological transfer process, if the defendant looks like a suspicious person, one capable of murder, the horrible nature of the crime of murder may be connected to this person. In the jury’s eyes, it may begin to seem plausible that he is guilty of murder. Any additional evidence, even if weak, may seem to confirm these suspicions. Thus the prosecutor’s digression, as a fallacy or argumentation tactic, is not just a logical failure, in an abstract sense of the term ‘logical’. It is a logically faulty argument that might nevertheless turn out to be highly persuasive to a jury in some cases.

This example can be used to sum up the main elements of relevance as a concept central to argumentation theory. To see what relevance is, the best place to start is an example where it has failed. That is, the beginning point is to examine an example of irrelevance, and diagnose what the failure (or fallacy) is, in that case. In the horrible crime of murder example, there is a target statement to be proved – the ultimate
probandum. The fault of the given argument is that it leads somewhere else. This fault is not a purely logical failure, in a narrow sense, for the argument could be valid. The problem, as many logic textbooks have told us over the centuries, is that it has the wrong conclusion. But what kind of failure is that? What kind of adequacy requirement on an argument is implied? The answer is to be sought in stasis theory. The adequacy requirement is that a potentially successful argument must be aimed at an ultimate conclusion that is supposed to be the target of proof. How is such a conclusion designated? In a trial, it is set at an earlier stage of the proceedings. It is set by the issue to be decided, by the type of trial, and by the burden of proof. In a criminal trial, for example, as indicated in the example of the horrible crime of murder, the prosecution has the burden of proving that the accused party is guilty of the crime alleged in the charge.

Here then we see all the elements of relevance. There is some procedural framework, like a trial or an investigation, and there is some issue that it is supposed to resolve, or some problem it is supposed to solve. In other words, the procedure has a designated statement representing its ultimate conclusion or aiming point. Argumentation that leads towards this point is relevant. Argumentation that leads elsewhere is irrelevant. What is assumed generally is that argumentation is a sequence with a start point and an end point. There are initially two possibilities of interest. The sequence can lead from the start point and reach the designated end point. Or it can reach some conclusion different from the designated end point, the wrong conclusion. But notice that such a fallacy of wrong conclusion is not what Aristotle described. On his account the fallacy of irrelevance is committed by the argument that is “something other than that leading” to this conclusion. But there is a third interesting possibility. The argumentation may initially look like it is leading to the right conclusion, but then curve off in a path leading towards a wrong one. Its ultimate aiming point might be undetermined. Yet even if it is unclear what specific conclusion it is aimed at, it might be irrelevant, by Aristotle’s criterion, because it leads somewhere else than along the path to the right conclusion. These three possibilities are diagrammed in figure 5 below.

Figure 5 represents three possibilities of interest, but real cases may admit of others. It is possible, for example, that there could be more than one path leading to the designated conclusion.
end point. For it is often the case in examples of argumentation that there is more than one way of proving the conclusion. There may be no single right path. And even worse, if the argumentation is just getting started, for example in a trial, not enough evidence may be in yet to indicate what the right path is.

4. Relevance in Trial Rules Based on Logical Relevance

There is an important distinction generally drawn between logical and legal relevance. According to Park, Leonard and Goldberg (1998, p. 125), “the term logically relevant has sometimes been used to refer to evidence that has any tendency in logic to establish a proposition”. Logical relevance, according to the approach outlined above, is to be determined by constructing an argument diagram representing the chain of reasoning in a case, and then making a judgment of what conclusion the chain is aiming at as its ultimate conclusion. Legal relevance is different, because it a procedural notion that has to be applied by a judge in a trial to determine what evidence should be considered admissible. Trials are very expensive, and therefore even if some evidence has some slight probative value, a judge may rightly exclude it as a waste of time that can best be spent on other more significant evidence in a case. Juries can also be unduly influence by evidence that might have slight probative value but considerable emotional and rhetorically persuasive impact. To reflect these considerations, “the term legally relevant has sometimes been used to refer to evidence whose probative value is great enough to justify the delay, expense, prejudice or confusion that is involved in considering it” (Park, Leonard and Goldberg, 1998, p. 125). Some distinction of this sort is clearly fundamental to any attempt to study rationality in evidence law, but the history of the subject shows that attempts to draw it precisely have been problematic.

The historical development of modern attempts to define relevance of a kind suitable for evidence law is outlined in volume 1A of Wigmore's treatise, Evidence in Trials at Common Law, pp. 1004-1095. The 1983 edition has a very substantial set of footnotes written by the editor, Peter Tillers. These lengthy footnotes bring the developments further along to 1983, and help explain Wigmore’s views and those of other leading relevance theorists. Michael and Adler (1934) wrote a two-part article, and a later article (1952), that attempted a definition of relevance using deductive logic. The attempt was not successful as a technical effort, and Wigmore (Tillers, p. 1005) did not find their system to be useful for evidence law. But it set the tone for further discussions by introducing key components of relevance. For example, Michael and Adler (1934, Part I, p. 1279) had the notion that an evidential proposition can be directly or indirectly relevant to another proposition. It is directly relevant if it is probative of it in a single step of proof. It is indirectly relevant to it by a transitive inferential relation from one single step to another. Michael and Adler (1934, Part I, p. 1279) thought they had shown that relevance is “entirely a matter of logic”. As they put it (p. 1279): “Whether or not one proposition is relevant to another is determined solely by the rational criteria provided by the principles of inference”. James (1941) also tried to use deductive logic to evaluate inferences used in relevance judgments. Using one of Wigmore’s examples, James (1941, p. 696) considered the generalization: people who make repairs to machinery after an accident show a consciousness of negligence. James argued that, in line with deductive logic, you can construe this statement in two ways. You can take it as a universal
generalization saying that all people who make such repairs show consciousness of negligence. One counter-example defeats such a universal generalization. Or you can take it as an existential statement saying that some people who make such repairs show consciousness of negligence. This dichotomy, however, is precisely what limits deductive logic as the basis for a theory of relevance. For the purpose of such a theory, the statement in question is best taken as expressing a defeasible generalization. On this analysis, it is said that people who make such repairs may generally be presumed to show consciousness of negligence, all other factors being equal. Such a presumption is a generalization, but one that holds only subject to exceptions that may not yet be known.

Once the limitations of deductive logic in modeling such generalizations is recognized, the natural next step is to see them as inductive. Ball (1980) moved from deductive logic to define relevance in terms of probability. There have been many attempts to define relevance using statistical probability of one sort or another. Most notable is the Bayesian approach to evidence represented by Schum (1994). Tillers (1983, p. 1013) concluded that although interest in this type of analysis continued, the theory has had little direct influence on proof-taking processes in courtrooms. In contrast to these two earlier approaches, the new approach of using defeasible reasoning based on argumentation schemes is potentially more interesting. It is a much nicer fit with legal argumentation of the kind used in amassing and presenting evidence in a trial. Using this new approach, relevance of an argument or piece of evidence can be determined by examining its place in a longer chain of reasoning modeled by an argument diagram. Such an argument is relevant if the chain of reasoning it is a part of aims at the ultimate probandum in the case. Of course, a careful distinction needs to be made between logical relevance of this sort, based on a chain of reasoning, and trial rules of relevance.

One of Ball’s (1980) leading criticisms of logic-based theories was a general failure to distinguish adequately between logical and legal relevance. Wigmore’s theory was based on a distinction between legal relevance and logical relevance, of a general kind that applies to any rational investigation or argumentation. He called it the science of proof. Assuming there is a science of proof in which logical relevance can be defined, Wigmore was then confronted with the following problem. What is the relationship between logical relevance and the trial rules used to judge relevance in the argumentation in a judicial tribunal at any given time? Wigmore held that there should be a relationship of this sort, because, in his view, the argumentation in a trial should be conceived as a rational process meant to seek the truth in a legal controversy about an issue. However, he felt that the relationship was a complex one. Some idea of this relationship can be gained from considering the four points quoted from Wigmore’s Principles by Twining, (1985, p. 156).

1. That there is a close relation between the Science and the Trial Rules analogous to the relation between the scientific principles of nutrition and digestion and the rules of diet as empirically discovered and practiced by intelligent families.
2. That the Trial Rules are, in a broad sense, founded upon the Science; but that the practical conditions of trials bring into play certain limiting considerations not found in the laboratory pursuit of the Science, and therefore the Rules do not and cannot always coincide with the principles of the Science.
3. That for this reason the principles of the Science as a whole, cannot be expected to replace the Trial Rules; the Rules having their own right to exist independently.

7 There is a large literature on defeasible reasoning in AI (Verheij, 1996; Prakken, 1997).
4. But that, for the same reason, the principles of the Science may at certain points confirm the wisdom of the Trial Rules, and may at other points demonstrate the unwisdom of the Rules.

These four points show very well how the relationship between the general notion of logical relevance of argumentation and the legal notion of relevance as expressed in a set of trial rules is indirect, but nonetheless highly significant. The scientific or logical notion of relevance is abstract and general. It represents general rules of a normative or logical sort that determine the kinds of moves that can be made in rational argumentation. The problem is how such abstract rules apply to individual cases of real argumentation that might occur, say, in a parliamentary debate or a legal trial, where there are actual rules of order, or procedural rules that bind the participants. To judge whether an argument is relevant or not in an actual case of one of these sorts, you need to recognize that there are actual rules, and there is even a judge or “speaker” whose job it is to see that these rules are followed. Such procedural rules, as Wigmore noted, have their own right to exist independently. They have a function, in relation to the purpose of the institution they are part of. In terms of argumentation theory, the distinction is between an abstract normative (logical) model, and a speech event, a particular event of argumentation used in a social or institutional setting for a purpose within that setting.

It appears then that there is a difficult and tricky job to be done, if we are to make further progress. It is one of grasping the relationship between logical relevance (if that is the right expression to stand for the notion of relevance as a normative structure of reasoning) and legal relevance of the kind defined in trial rules.

5. The Problem of Conditional Relevance

Relevance is defined in the Federal Rules of Evidence in a specific way that is based on Wigmore’s notion of it. His notion was, in turn based on theories of reasoning and evidence of Locke and Bentham (Twining, 1985). The FRE definition is fairly specific, but has led to interesting controversies about how it should specifically be interpreted. Thus any attempt to study relevance in legal argumentation begins there.

Rule 401 defines ‘relevant evidence’.

“Relevant evidence” means evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence.

The first question raised by rule 401 is the meaning of the terms ‘more probable’ and ‘less probable’. The FRE does not define them, but they can be taken to refer to what Wigmore called “probative weight”. A second question is the meaning of the phrase ‘of consequence to the determination of the action’. The “action” is the ultimate probandum in the given case, the statement to be proved or cast into doubt. Accordingly, if something is of consequence to the determination of the action, it means, in plainer terms, that it has an implication that gives the ultimate probandum more probative weight or less probative weight. Note, as well, that relevance is described as a tendency. It need not actually boost up or lessen the probative weight of the ultimate probandum, but it must have a tendency to do so. This rule is quite permissive, since just about any small bit of evidence can be
admitted, under the rule, if it has even a small effect on the probative value of the ultimate *probandum*. To cite an example, suppose that in a personal injury case, the defendant had a fight with his wife on the morning of the accident. That might have had an effect on his driving that day, perhaps leading him to pay less attention to it. So it would qualify as relevant evidence under rule 401 (Park, Leonard and Goldberg, 1998, p. 124).

Rule 402 states that relevant evidence is generally admissible in a trial, and that irrelevant evidence is not admissible. Rule 403 allows for the possibility of excluding evidence that is otherwise relevant according to rule 401.

Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence.

Thus something that might be relevant under rule 401 could be excluded as inadmissible in a trial, under rule 403. For example in the personal injury case cited above, the court would “almost certainly exclude the evidence” of the domestic fight “as a waste of time”, or exclude it “for reasons of unfair prejudice” under rule 403 (Park, Leonard and Goldberg, 1998, p. 125). According to rule 404, character evidence is not admissible to prove conduct generally, but three exceptions are listed. First, evidence of character may be offered by one side to rebut a character claim introduced by the other. Second, evidence of the character of the victim of a crime may be offered, for example to show peacefulness. Third, evidence of the character of a witness can be admissible in some instances. For example, the character of a witness for truthfulness could be admissible.

It needs to be noted as well that rule 104(b) says that relevance can be “conditioned on fact”. This means, in logical terms, that evidence is admissible even if it satisfies rule 401 only if taken together with additional statements not yet proven to be facts.

When the relevancy of evidence depends upon the condition of a fulfillment of fact, the court shall admit it upon, or subject to, the introduction of evidence sufficient to support a finding of the fulfillment of the condition.

As the notes of the Advisory Committee indicate, rule 104(b) expresses the notion of conditional relevance. Two examples cited by Ball (1980, p. 437) illustrate what the notion of conditional relevance is taken to be.

The Letter Example

If a letter purporting to be from Y is relied upon to establish an admission from him, it has no probative value unless Y wrote or authorized it.

The fact that X carried life insurance in favor of Y is said to be conditionally relevant because “it has no probative value unless Y wrote or authorized it”.

In other words, conditional relevance means that one statement might not be relevant by itself, but it could be relevant in another sense (conditionally relevant) if, taken together with another

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8 Ball quoted these words from the Notes of the Advisory Committee on the Federal Rules of Evidence from their explanation of Rule 104(b).
statement, the pair of them are relevant. Thus the relevance is conditional or hypothetical, because it depends on a further assumption or hypothesis that needs to be added in.

Another example might help to show how this notion can be applied to many cases.

The Breach of Contract Example

If P sues D for breach of contract, and offers evidence of an oral offer made to X and acceptance thereof by X in behalf of D, the offer and acceptance are irrelevant unless X’s authority to act for D also exists.

Here the pattern of conditional relevance is the same. The statements about the offer and acceptance are “irrelevant”, if that is all there is to consider. But they are conditionally relevant, meaning that they become relevant if you add in the statement that X was authorized to act for D. Relative to that condition, or that additional assumption, they are relevant. Conditional relevance seems to broaden the notion of relevance in rule 401.

It is easy to appreciate that the notion of conditional relevance is a little scary, as it might seem to offer a carte blanche for proving relevance in any case you might care to consider. After all, any statement could be relevant if you add in a bunch of conditions under which it would be conditionally relevant. This possibility would be alarming, from a point of view of trial practice. Another problem shown by Ball is that conditional relevance is hard to define, in precise operational terms, as an exact logical concept. As he argued (1980, p. 458), the initial statements in both cases are misleadingly described as “irrelevant”. They are somewhat relevant, but when the other conditions are added, they become “more relevant” so to speak. But it is difficult to precisely measure how much more relevance is needed to get them over the threshold from slightly relevant, or conditionally relevant, to categorically relevant. Ball (1980, pp. 441-453), using the breach of contract example, argued that straightforward attempts to operationally define it using deductive logic, based on Aristotelian syllogistic, or inductive logic, based on assigning probability values to the statements in the case, do not work. This finding too is bit scary. A notion that cannot be precisely analyzed by a logical structure is fuzzy, and may possibly create confusion or even lead to abuse. Ball concluded that conditional relevance is a “myth”, not a concept needed in law. Thus the notion of conditional relevance became highly controversial, and doubts lingered about its usefulness and conceptual respectability as a logical notion.9

Here, without any attempt to be complete, it is helpful to outline some of these technical controversies. Friedman (1994) argued that conditional relevance is misleading and too formalistic, and that it ought to be replaced by the notion of conditional probative value. Tillers (1994) expressed doubts both about Ball’s idea of abolishing conditional relevance and Friedman’s idea of replacing it with conditional probative value. Nance (1995) supported Friedman’s claim that conditional probative weight helps to “clarify the logic of proof” (p. 419), but disagreed with his proposal to amend the FRE by eliminating the notion of conditional relevance.

Over and above the technical controversies about defining relevance, or analyzing it in a precise logical structure, there have been much broader controversies about the exclusionary rules 403 and 404. According to Damaska (1997, p. 14), the practice of

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9 As Nance (1995, p. 419) put it, there has been “a substantial body of academic criticism of the traditional doctrine” of conditional relevance.
excluding relevant evidence is more marked in Anglo-American law than in continental law, and it became prevalent in the U.S. after World War II. This trend has led to concerns on whether the increasing use of such exclusionary rules has gone too far, even resulting in decisions that appear to be illogical. At one extreme, some might argue that if evidence is logically relevant, it ought also be legally relevant. Jeremy Bentham (1748-1832) can be cited as an early and emphatic proponent of this view. He advocated a natural system in which all relevant evidence should be considered in a trial (Twining, 1985). Drawing a careful distinction between logical and legal relevance helps greatly to reframe this issue to show the importance of conditional relevance in it.

6. Relevance in Static and Dynamic Argumentation

The basic components needed to make a theory of relevance have now been identified. The evidence in a given case is represented as an argument diagram. The points are the given statements and the arrows (arcs) are inferences from premises to conclusions drawn on the basis of argumentation schemes. It is assumed that each given statement has an initial probative weight as evidence and that when an inference is drawn from a set of premises to a conclusion, the probative weight of the conclusion may be increased. There are various rules (or sets of rules) that can be used to calculate this transformation. One set of rules would be the rules for the probability calculus, i.e. Bayesian rules. There are many rules of a different kind that have been used in AI called confidence factors. A rule of this sort for plausible reasoning proposed by Rescher (1976, is the least plausible premise rule: the conclusion must be at least as plausible as the least plausible premise in the argument. But I will not attempt to go into the question of which set of rules is the best. Broadly speaking my theory is that relevance is a matter of getting from here to there in argumentation. It is a matter of getting from a set of given statements and inferences by chaining the reasoning forward toward an ultimate probandum statement as the projected end point in the chain. The steps of inferences in the chain are warranted by argumentation schemes, and the chain of reasoning is represented by an argument diagram. These are the basic components of the theory of logical relevance.

Before trying to put them together, and then to apply them to cases, a question needs to be asked. We need to ask what the theory is supposed to do. What do we want it for? The problem is that there is a range of cases of different kinds. Judgments of relevance are required to be made at different points within different stages during the progress of a given investigation or a discussion. First, the distinction between static and dynamic argumentation needs to be made. In a static case, it is assumed that the knowledge base is closed off. In a dynamic case, it is assumed that new evidence will come in as the investigation or discussion continues. Even in the static case, the evidence may not comprise all the knowledge that could be obtained. For epistemic closure is often achieved, for practical purposes, by assuming no further evidence will be collected or considered. The static case is the type more familiar in logic. For example, one might look at the transcript of a legislative debate, and make an evaluation to see whether an argument used at some point in the debate was relevant or not. It seems fairly clear,

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10 Actually the rule (Rescher, 1976, p. 15) is more complicated than this. For one thing, the premises are required to be consistent with each other. However, the version stated above conveys the gist of it.
however, that the intent of the FRE is to provide rules of relevance that give guidance to a
court on how to rule on whether evidence should be admissible or not, at any given point
during a trial. They are trial rules, or procedural rules for the conduct of a trial. Such rules
are meant to be applied by the judge to dynamic argumentation during the trial itself.

The problem for judging relevance in dynamic argumentation is that a judge does not
know, in advance, which way a line of argumentation will go. Each side has a strategy,
and one side does not know the strategy of the other. They can only guess, by
imaginatively trying to simulate the plausible strategies of the other side. But such
guesses, or heuristics, can be very limited, especially at the early stages of an argument,
where it is unclear yet where it seems to be leading. Thus against the objection
“Irrelevant”, the other side in a trial might reply, “If your honor will just give me a few
minutes, I can show the court where this is going to lead”. This sort of reply indicates
what I think is the rationale for relevance in dynamic argumentation. It is to save time
and effort by cutting down the need to follow lines of argumentation that will not be
useful to help settle the issue that is supposedly being discussed in a meeting. In other
words, it has a practical or pragmatic function. That function is often to save time. If too
much time is taken up with argumentation that is irrelevant, the relevant arguments may
never get discussed. And that is a big problem. For the purpose of the discussion may
only be achieved if the strongest and most convincing arguments on both sides are
articulated and considered. Thus irrelevant argumentation may prevent the goal of the
dialogue from being achieved.

I believe it is this problem of dealing with dynamic argumentation that gives rise to
the problem of conditional relevance. Consider Ball’s letter example. If the prosecution
(let’s say) had a letter purporting to be from Y that made some damaging admission, then
presumably during the pre-trial investigation it would look for evidence that could prove
that the letter was written or authorized by Y. If in fact there was no such evidence at all
that could be collected and brought forward, then the prosecution should not even bother
asking for the letter to be admitted as evidence. If they do so ask, then according to rule
104(b), the letter should not be admitted unless the prosecution can give some additional
evidence of a kind that makes it relevant. Much the same analysis applies to Ball’s breach
of contract example. The function of the notion of conditional relevance is to amplify the
rule of relevance to deal with incomplete arguments that depend for their relevance on
being completed by evidence that doesn’t exist yet. It only potentially exists at some
future point in a line of dynamic argumentation that is not yet known or determined, at
least to anyone other than the proponent of the argument.

What is confusing about the notion of conditional relevance is that such evidence
becomes relevant as evidence when completed by the missing part. But in dynamic
argumentation, whether these missing parts will ever be filled in is not known yet. All
that conditional relevance leads to is a dialogue between the judge and the claimant on
where the claimant’s argument is going. Thus conditional relevance has a legitimate
function in any set of procedural rules for guiding judgments of relevance in dynamic
argumentation. That function is a practical one of blocking time-consuming or prejudicial
arguments that will, in the end, turn out to be useless to help resolve the issue of a
discussion. Such arguments could prolong the discussion without helping it move
towards achieving its goal. But conditional relevance seems scary, when we see it
 appended to rule 104, because it is called relevance of a special sort, suggesting that some
item of evidence might be called relevant when really it might not turn out to be relevant at all. It might be better to call it potential relevance, or claimed relevance. Perhaps because of these subtleties, conditional relevance has only been applied to a narrow range of cases by the courts. As Park, Leonard and Goldberg (1998, p. 16) commented, “Though the scholarship in the area is intriguing and clever, it has yet to have much impact on the way the courts view the subject.” These problems suggest that until the underlying logic notion of relevance has been more clearly defined, there will be little confidence in applying a notion as potentially tricky as conditional relevance.

The recognition that in evidence law, relevance is primarily a practical tool applying to dynamic argumentation, raises new questions about how this tool ought to be applied. If one can’t tell in advance where a line of argumentation will go in the future, how can one ever judge whether a particular argument or question is relevant? For after all, the judgment has to be made now, on what is known or not known about the argumentation at this point, in cases of dynamic argumentation. In cases of static argumentation, one can construct an argument diagram. For example, a Wigmore chart representing the mass of evidence on one side might be constructed. Once the case has been concluded, and there is a transcript of all the discourse recorded in the trial, one has a map showing where each line of argumentation went in relation to the ultimate probandum. Once the trial is over, and the trier is at the stage of making deliberations, as it is called, static judgments of relevance can be made. Even at this stage, judgments of relevance can be open to disputation. But as contrasted with static argumentation of this kind, consider the problem of judging relevance in dynamic argumentation. Any argument diagram will be incomplete, representing only the argumentation at some earlier or later point in the case. Clearly the argument diagram by itself sufficient to make a determination of relevance unless consideration is taken of missing premises needed to make the chain of argumentation move forward to the ultimate conclusion to be proved. How can this be done?

7. Conditional Relevance and Enthymemes

There are clear cases where an argument is relevant and clear cases where it is not. However, many cases of relevance judgments in dynamic argumentation are hard cases. The method in such cases is to build up an argument diagram of the given argument based on the evidence in hand so far, then chain this argumentation forward toward the ultimate probandum. If the chain arrives at this end point the given argument is relevant, otherwise it is not. This seems easy, but how is such a chaining forward actually to be carried out. All one can do is to use heuristics to judge whether the projected chain of argumentation seems to be moving toward the ultimate probandum or not. What we do have are the argumentation schemes, including deductive and inductive forms of argument as well as presumptive argumentation schemes. These can be applied to the statements in the data base recursively to generate new arguments. This part of the method can be carried out with the assistance of the argument diagramming software Araucaria, by breaking down the given argument into a definite set of statements and marking them up as premises and conclusions. But can Araucaria take unstated premises and conclusion into account that are needed by an argument? The answer is affirmative. Araucaria can deal with enthymemes, or arguments with unstated premises...
or conclusions. This was shown in the analysis of the forensic case displayed in figures 1, 2 ad 3 above. In Araucaria, the user can inset missing premises or conclusions in an argument by clicking on an icon in the toolbar, enabling the user to type the missing assumption into a box. When the statement is added to the argument diagram, it is shown as a different colored circle, or box in a full-text-diagram, indicating it was an unstated assumption in the argument. Of course, the user has to judge, in any given case, whether a statement is needed as a missing premise or conclusion in an argument. But Araucaria will mark the assumption as enthymematic, once it has been inserted.

The arguments cited as examples of conditional relevance given by Ball fall into the category of enthymemes. An enthymeme is an argument like ‘All men are mortal, therefore Socrates is mortal’, that depends on an unstated premise. In this case the missing premise is the statement ‘Socrates is a man’. In the letter example, the premise that Y wrote or authorized the letter is very much the kind of assumption that would be classified as a missing premise in traditional logic. The argument is based on the generalization that if an agent wrote or authorized a letter containing an admission in the form of a statement asserted, then that agent is committed to that statement. This generalization does not match the warrant of any known argumentation scheme, unless it falls under the scheme for argument from commitment. It seems more like what is often called a common sense generalization (Anderson, 1999), or maybe it is an empirical generalization. Both of Ball’s examples represent the linked argument pattern. Thus in both examples, the assumption in question is a premise that is needed in a linked argument, but is the kind of premise that may not be stated. Still, one of the most useful tools for filling in unstated assumptions in common arguments is the set of argumentation schemes. In many common kinds of cases of linked arguments, one explicitly stated premise can only function as evidence, as a useful argument with probative weight in a case, once it has been supplemented by the missing premise needed to make the entire argument fit an argumentation scheme.

The method of argument diagramming as outlined so far can be applied even to some hard cases. But in other hard cases, it may be harder to judge where a pleader is going with a line of argument based on some newly offered evidence that doesn’t chain forward to the ultimate probandum in any single obvious chain of argumentation. In these cases, a judge needs to rely on knowledge of past, comparable cases. There will be different paths through the evidential tree that represent routines, or standard ways of proving certain kinds of conclusions. Keppens and Zeleznikow (2002) gave the example of the problem facing police officials encountering a dead body. The hypotheses are “homicide”, “suicide”, “accident”, or “natural causes”. What is the best explanation? Evidence may be subtle, hidden and hard to collect. In most countries, death by suicide or homicide is rarer than death by natural causes (Keppens and Zeleznikow, p. 2). Once a hypothesis is selected, evidence can be collected and tested, leading to support or refutation of the hypothesis. But there is a danger that once a hypothesis is selected, evidence supporting alternative hypotheses may be ignored. What such cases show is that not all relevance judgments can be mechanized by chaining forward recursively from a database using an argument diagram and argumentation schemes. Chaining forward tentatively using abductive reasoning from a data base, standardized lines of argument or best explanations can be applied. Someone with experience of homicide investigations, for example, knows by experience how to apply the standard best explanations to the data. What these
considerations indicate is that the reasoning structure – that is, the given statements, the argumentation schemes and the argument diagram – are not sufficient for judgments of relevance. In some cases, the judgment is partly contextual.

Finally it needs to be stated he notion of relevance in use in recent argumentation theory is partly contextual. It depends on the purpose of a conversation. An argument that is relevant in one conversation could be irrelevant in another one. This contextual relativity of relevance is implicit in the way Hermagoras defined it as relative to a speech. One satisfying thing about Wigmore’s approach is that he so clearly recognized this contextual variability of relevance. The following example, quoted from (Wigmore, 1935, p. 8) demonstrates this awareness, and its importance for any theory of relevance.

When you and your friend have met to dine at the restaurant, and the attentive waiter lays before each of you a copy of the menu and the guest is concentrating upon the question “What to choose?”, suppose that you, in your zeal for the horticultural topic just discussed with him, continue thus: “What proves that the Corona rose can be grown from cuttings in this climate is the testimony of four of my neighbors who did that very thing last winter!” Then might not your friend mildly protest, “I cannot listen to that testimony now, because the only issue before us is whether we are to consume a lamb chop or a porterhouse steak.”

This example shows that whether an argument is relevant depends on what type of conversation the discusants are supposed to be engaging in. In the conversation about what to choose from the menu, once the waiter has arrived, and all agree that choosing something for dinner is the issue, the argument about the Corona rose is irrelevant. But before the waiter arrived, and the conversation was about the issue of horticulture, that same argument was relevant. This case represents what is called a dialectical shift (Walton, 2002, pp. 308-313) of a kind that can be called an interruption. Sometimes it happens that a conversation has to be interrupted, perhaps in order to make a decision about something else. Such a shift has a negative impact on the argumentation on the original conversation. It stops it, at least for the time being. But in many cases the original conversation can be continued, once the second issue is settled, and so the harm is minimal.

To apply schemes and diagrams as tools to judge relevance in a given case, basic assumptions have to be made about what type of dialogue the argumentation is supposed to be part of. In one way, this problem is easily solved with respect to making judgments using the FRE, because it is clear that the context of dialogue is that of a common law trial. Here we can deploy the adversarial model of the trial as a dialogue process with burden of proof set in the confrontation stage. The purpose of the trial is to resolve a conflict of opinions by allowing each side to put forward its strongest arguments and its strongest attacks on the arguments of the other side. The neutral trier decides, once the argumentation stage has been completed, which side met its burden, thus resolving the dispute. On this view, the trial is a kind of critical discussion (Feteris, 1999; Walton, 2003). There is little space here to amplify this view of the matter. It is enough to say that what sets the stasis, or aiming point of a chain of argument, is a context of dialogue.

Wigmore’s view of relevance is broadening. It suggests that one can’t make a judgment of relevance only by studying an actual chain of reasoning, using an argument diagram. One also has to supplement this evidence with a heuristic judgment of where the line of argumentation is going. One needs to try to judge where the line of argumentation is heading, starting from the existing part represented by the argument diagram, and
aiming at the end point represented by the ultimate conclusion. This judgment depends on
the framework of dialogue the argument is part of. The same argument could be
relevant in a negotiation but irrelevant as part of a critical discussion aimed at finding the
truth of the matter being discussed. Thus different heuristics might be needed for
different types of dialogue, or might be employed in different ways. The best approach is
to begin with the easier cases and work up a method that applies the reasoning structure
to them. These methods can be applied to any subject domain. From there, the heuristics
that apply to special types of cases commonly found in trials need to be studied. It will be
these heuristics that will be useful as applied to the harder cases.

It should not be surprising that the above procedures of chaining of reasoning using
argumentation schemes and diagrams, useful though they are for defining relevance
theoretically, are not sufficient to determine dynamic relevance in harder cases in trials.
Twining (1999) pointed out that employing common sense generalizations has its
dangers, not the least of which is the use of prejudicial, irrelevant and fallacious
argumentation that can be appealing to jurors. MacCrimmon (2001) has warned that
common sense generalizations, heuristics, including inferences based on suggestion and
innuendo, are so complex and subtle that we may never be able to fully automate them.
Even if we can automate them to some useful extent, as indicated above, there is every
reason to doubt that the automated structure would trivially apply to harder cases of
dynamic relevance. The structures of logical relevance underlie the trial rules, but they do
not substitute for the judge’s job of applying the trial rules to a hard case. Not only might
the database be too small, but applying the rules of inference to it may not go very far
towards the ultimate probandum, and there might be too many paths to choose from.
Even so, the approach proposed above shows how existing techniques widely used in AI
and argumentation, like chaining forward, argument diagramming and heuristics, are
useful tools for precisely defining logical relevance. They offer a reasoning structure that
reveals how logical relevance underlies the notion of legal relevance that is the basis of
trial rules like the FRE. At the same time, interesting cases of legal relevance and
irrelevance judgments in trials provide a fertile source of data useful for testing abstract
theories of logical relevance.

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11 The dialectical approach to legal argumentation is well supported by recent work in AI. Among many
recent studies in the new field of computational dialectic that might be cited are (Gordon, 1995), (Lodder,
1999) and Verheij (2002).


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