

# Argumentation with Wigmore Charts and Computing

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## INTRODUCTION

In the previous article, “Argumentation and Computing,” we provided an overview as well as some operational knowledge of this important, emerging intersection of *argumentation* (paramount as it is in philosophy, ethics, and law) and *computational models* or *computer tools*. In the present short entry, instead, we focus on providing operational knowledge about a particular graphical notation for argumentation, *Wigmore Charts*, quite valuable for legal scholars, yet which have deservedly come within the notice of computer scientists. Once you learn how to use Wigmore Charts, they may well be the handiest notation around. This is why we find it important to teach how to use them.

Whereas arguably *MarshalPlan* (Schum, 2001) is the principal computer tool to incorporate Wigmore Charts, also consider that at the interface level, Wigmore Charts can be used in any out of a number of argument visualization tools. *Araucaria* (Reed & Rowe, 2004), which is freely available, is a visualization tool in which use of Wigmore Charts has been reported in the literature (Prakken, Reed, & Walton, 2003).

It is important to realize that the name *Wigmore Charts* does *not* cover every visualization of complex argumentation in which propositions are nodes and evidential relations are links. The term has been (and should) be used for Wigmore’s distinctive kind of argument diagrams, and the term *argument diagram* or *argument map* has been used for the more general class. There are several kinds of visualization of argument which have nothing to do with Wigmore Charts (or Wigmorean analysis). Yet, Wigmore’s own original conventions for his diagrams were complex, and in recent decades, a few authors developed a simplified version for which they retained the name *Wigmore Charts*. This accounts for differences among a few visualizations that go by the name *Wigmore Charts*.

## BACKGROUND

American legal scholar John Henry Wigmore (1863-1943) introduced a complex graphical notation for legal argument structuring (Wigmore, 1937). Wigmore Charts were usefully simplified in Anderson and Twining (1991, cf. Anderson, 1999). Schum (2001) used them in *MarshalPlan*. Wigmore’s original notation was much more complex, for example, distinguishing whether a claim was made by the plaintiff or by the defendant. This is not strictly necessary for a notation for argumentation in law, let alone for argumentation for general purposes.

Let us consider a context of use of Wigmore Charts in a tool which also incorporates other formalisms. Hopefully, seeing things in context rather than just learning about Wigmore Charts in isolation will help the reader to better realize why this kind of diagram is meaningful.

*MarshalPlan* is a tool for marshalling the evidence and structuring the chronologies and the arguments by means of a formalism, based on Wigmore Charts, at pre-trial and trial within the American system of legal procedure (not only for criminal cases, but in civil cases as well). *MarshalPlan* is not available commercially (so many interesting tools developed by scholars are not), but it can be obtained from its developers (through Professor Peter Tillers at the Cardozo Law School in New York). It has been variously applied within legal, medico-legal, and legal didactic applications.

The formalism in *MarshalPlan* is organized as an algebra. Statistical processing can be added. *MarshalPlan* is intended to provide:

- a. an environment allowing the development of a case-specific database of evidence and evidentiary details;
- b. support for the development of lines of fact investigation;

- c. support and documentation of investigation protocols;
- d. organization of evidence relevant to given proposed hypotheses or scenarios;
- e. visual representation of the chronological relationships between facts according to hypothesized scenarios;
- f. visual representation of chronologies involved in the narrative and proceedings;
- g. visualization of argument structures;
- h. support and protocols for checking, testing, and evaluating evidence;
- i. temporal consistency checking; and
- j. a bridge to forensic disciplines such as forensic statistics.

Prakken et al. (2003), a paper on using argumentation schemes for reasoning on legal evidence, is mainly an exploration of applying *Araucaria* to an analysis in the style of Wigmore Charts. Prakken and Renooij (2001) explored different methods for causal reasoning, including argument-based reconstruction of a given case involving a car accident. The main purpose of Prakken (2004) “is to advocate logical approaches as a worthwhile alternative to approaches rooted in probability theory,” discussing in particular logics for defeasible argumentation:

*What about conflicting arguments? When an argument is deductive, the only possible attack is on its premises. However, a defeasible argument can be attacked even if all its premises are accepted...One way to attack it is to rebut it, i.e., to state an argument with an incompatible conclusion...A second way to attack the argument is to undercut it, i.e., to argue that in this case the premises do not support its conclusion.* (Prakken, 2004, Section 3.2)

## AN EXAMPLE OF WIGMOREAN ANALYSIS

Let us use Anderson’s (1999) simplified notation in order to evaluate evidence in a “whodunit” context. Remember that common-sense generalizations (rules of thumb about behavior) are involved in such reasoning. Seeing things done is a powerful didactic tool. The intent of providing here a fully developed example is to show the reader how to develop an application in

its entirety, and to give the reader the final satisfaction that we analyzed “a case,” without the disappointment of just having done something extremely simple, which would be didactically dreary.

We are not going to analyze an actual courtroom case. Rather, we make an example out of a fairly routine situation of bringing up children. Mum is in the roles of the investigator, the prosecutor, and the judge, whereas Dad helps with the investigation and turns out to be the defense counsel. Grandma is a witness, called by the defendant (one of the children).

As per Anderson’s (1999) conventions, let circles be claims or inferred propositions. Squares are testimony. An infinity symbol associated with a circle signals the availability of evidence whose sensory perception (which may be replicated in court) is other than listening to testimony. An arrow reaches the *factum probandum* (which is to be demonstrated) from the *factum probans* (evidence or argument) in support of it, or possibly from a set of items in support (in which case the arrow has one target, but two or more sources). A triangle is adjacent to the argument in support of the item reached by the line from the triangle. An open angle identifies a counterargument instead.

An example of such a Wigmore Chart is given in Figure 1. The numbered propositions follow next. Here is the story. A boy, Bill, is charged with having disobeyed his mother, by eating sweets without her permission. The envelopes of the sweets have been found strewn on the floor of Bill’s room. Bill tries to shift the blame to his sister, Molly. The mother acts as both prosecutor and fact finder: it is going to be she who will give a verdict. Dad is helping in the investigation, and his evidence, which may be invalid, appears to exonerate Bill. This is based on testimony that Dad elicited from Grandma (Dad’s mother), who is asked to confirm or disconfirm an account of the events given by Bill, and which involves Grandma giving him permission to eat the sweets and share them with Molly. Grandma’s evidence is problematic, because Dad’s approach to questioning her was confirmationist (i.e., such that would tend to confirm an assumption). Grandma has received from Dad a description of the situation. She may be eager to spare Bill punishment. Perhaps this is why she is confirming his account. Yet, for Mum to make a suggestion to that effect, that the truthfulness of her mother-in-law’s testimony is questionable, is politically hazardous and potentially explosive.

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