ISSA Proceedings 2010 – Arguments, Stories And Evidence: Critical Questions For Fact-Finding

1. Introduction

In this paper, we look at critical questions for the process of reasoning about the *facts* and the *evidence* in criminal cases **[i]**. In the literature, essentially two approaches to this reasoning can be can be distinguished: the argumentative and the narrative approach. In the argumentative (or argument-based) approach, the facts should be supported by reasons based on evidence. Key questions for argumentative approaches include which reasons can support which conclusions under which circumstances (the search for warrants and argumentation schemes, cf. Toulmin 1958, Walton et al. 2008) and how to handle conflicts of reasons and exceptions (the defeasibility of argumentation, cf. Loui 1995). The argumentative approach in legal fact-finding is based on Wigmore (1931), whose hand-drawn evidence charts predate many later developments in legal theory (Anderson et al. 2005). The approach has been explored in the field of argumentation by Walton (2002) and Bex et al. (2003), who propose and analyse numerous argumentation schemes that can be used to reason from the evidence to the facts.

The second approach to the rational establishment of the facts involves presenting these facts as narratives or *stories* – coherent descriptions of what might have happened – that causally explain as much of the evidence in the case as possible. In a criminal case the narrative typically includes the events of the crime (e.g. the victim being shot) information about the intentions of the criminal (e.g. vengeance) and the consequences of the crime (e.g. a dead body). Key questions in a narrative approach include how to establish the coherence and quality of stories (the search for plausibility criteria), when to believe a story (the issue of justification of the belief in a story) and how to choose between alternative stories (the issue of story comparison). The narrative approach has been studied as a model of cognitive decision-making in the psychology of law

(Pennington and Hastie 1993, Wagenaar et al. 1993) and as a more analytical model for inference to the best explanation in (legal) philosophy (Josephson 2002, Thagard 2004, Pardo and Allen 2007). The narrative approach is less well represented in the literature on argumentation. In this paper we will show that a strong analogy can be drawn between reasoning patterns in argumentation, the familiar argumentation schemes (Walton et al. 2008), and patterns in the narrative approach, which we call *story schemes* (Bex 2009). These story schemes act as a background for particular instantiated stories in the same way as argumentation schemes act as a background for particular instantiated arguments. Furthermore, story schemes give rise to relevant critical questions in the same way as argumentation schemes.

In our opinion, neither the purely argument-based nor the purely story-based perspective can do justice to all relevant mechanisms as they are recognized and used by decision makers and investigators. Instead a *hybrid* argumentative-narrative approach, in which arguments and narratives can be used in conjunction as well as interchangeably, is to be preferred (Bex et al. 2007, Bex et al. 2010, Bex 2011). In this paper, we will review this hybrid approach in a semi-formal way (as opposed to the formal logical presentation of Bex et al. 2010), focusing on the types of schemes used in both argumentative and narrative reasoning. Furthermore, we present the list of critical questions from (Bex and Verheij 2009)**[ii]**, which point to typical sources of doubt in a hybrid argumentative-narrative case in the same way as critical questions for argumentation schemes point to typical sources of doubt regarding a single inference. These critical questions are then used to analyse the verdicts in the Nadia van der V. Case **[iii]**. The case concerns Nadia, who has been killed in her home by several gunshots. Her landlord, Pascal F., is regarded as the prime suspect. He has been seen fleeing town in Nadia's car and is not to be found until well into the next year. When Pascal is finally apprehended, he is charged with murder and found guilty by the lower courts as well as on appeal.

2. A hybrid argumentative-narrative theory
In this section, we will discuss the argumentative and narrative approaches before proposing our hybrid combination. Additionally, the discussion below will also focus on the use of various types of commonsense knowledge expressed as schemes. Reasoning with evidence involves a large amount of commonsense knowledge about the world around us, which allows us to assume or infer new

information in a way that is as safe as is needed in the context. In this paper, we show that in the argumentative approach commonsense knowledge often takes the form of *argumentation schemes* (Walton et al. 2008), general patterns of argument that act as a background for particular instantiated arguments, and that in the narrative approach such knowledge takes the form of general scenarios that can be seen as *story schemes* (Bex 2009), standard general event-patterns that act as a background for particular instantiated stories.

2.1. Argumentative Approach

In the argumentative approach, arguments are constructed by performing consecutive reasoning steps, starting with one or more items of evidence and reasoning towards a conclusion, a fact at issue in the case. The reasoning steps in these arguments have associated generalizations that justify the inferences (cf. Toulmin's warrants and Walton's schemes). For example, the evidence 'a witness testified that a man who looked like Pascal was in the car' and the generalization 'witnesses usually speak the truth' allows us to infer that 'a man who looked like Pascal was in the car'. This intermediate conclusion can then be used to infer that it was indeed Pascal who was in the car. Thus lines of reasoning can be combined to construct argument trees, which can be rendered as diagrams (Freeman 1991; Reed et al. 2007). Take, for example, Figure 1.
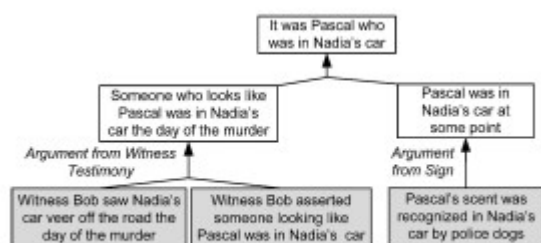

Figure 1: an evidential argument

The argument in Figure 1 uses typical generalizations, such as the above-mentioned generalization about witnesses, to justify the inferences. These generalizations can be rendered as argumentation schemes; for example, consider the scheme for Argument from Witness Testimony (Walton et al. 2008, Bex et al. 2003):

Witness *w* is in a position to know whether *a* is true or not.

Witness *w* asserts that *a* is true (false).

Therefore, *a* may plausibly be taken to be true (false).

Now, Bob asserted that someone looking like Pascal was in Nadia's and Bob was

in a position to know this, as he saw Nadia's car. Similarly, the evidence that Pascal's scent was in the car is a sign for the fact that Pascal was in the car at some point (Argument from Sign, see Walton et al. 2008). In addition to these general schemes, more (case-) specific generalizations are also used as inference licences in Figure 1. For example, the top inference is justified by the generalization 'if person x was in a car at some time and someone looking like x has been seen in that car at time t, then it is likely that the person in the car at time t was x'.

In the argumentative approach, the individual facts at issue are supported by the evidence in the case through arguments. The argument-based approach is inherently *dialectical*: not only evidence supporting the probanda but also evidence against them should be considered, and any sources of doubt in the arguments should be made explicit. The critical questions associated with the argumentation schemes in the arguments are a useful aid here, as they point to ways in which an argument based on a scheme can be attacked (Bex et al. 2003; Verheij 2003). Take, for example, the critical questions for the Witness Testimony scheme:
1. Was w is a position to know a?
2. Is w truthful??
3. Is w biased?
4. Is w's statement that a internally consistent?
5. How plausible is w's statement that a?
6. Is a consistent with what other witnesses say?

These critical questions give pointers on how and where an Argument from Witness Testimony might be attacked. For example, the third question asks if there is an exception to the general scheme (i.e. normally, if a witness says something this is true but in Bob's case we have reason to believe this is not so because Bob is biased); the sixth question asks for other arguments (e.g. from another witness testimony that the man in the car did not look like Pascal). Question 5 is interesting in that it asks for the inherent plausibility (i.e. irrespective of evidence) of the statement that someone who looks like Pascal was in Nadia's car. We will return to this inherent plausibility when we discuss stories and story coherence below.

The argumentative approach is a dialectical way of reasoning with and about the evidence in a case. Argumentative reasoning has been called *atomistic* because

the various elements of a case (i.e. facts, evidence) are considered separately and the case is not considered 'as a whole'. The approach builds on a significant academic tradition of research on informal and formal argumentation and is well suited for a thorough analysis of the individual pieces of evidence and the inferences that can be drawn from them, using critical questions to probe the arguments for possible weak spots. However, the atomistic nature of arguments makes them less suitable for giving an overview of the various hypothetical scenarios about what happened in the case.

2.2. The Narrative Approach

In the narrative approach, the facts of the case are organised into one or more stories: coherent chronological sequences of events about what (might have) happened in the case. In this approach, the evidential data in the case should be causally *explained* by such hypothetical stories through abductive inference. The basic idea of abductive inference (see e.g. Walton 2001) is that if we have a general rule '*c* is a cause for *e*' and we observe *e*, we are allowed to infer *c* as a possible hypothetical explanation of the effect *e*. This cause *c* which is used to explain the effect can be a single state or event, but it can also be a sequence of events, a story. Take, as an example, the observation that Nadia is dead. According to the prosecution's story, Nadia's death was caused by Pascal shooting her:
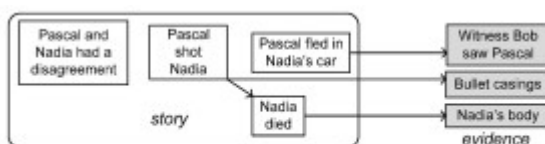

Figure 2: A story which causally explains the evidence

The arrows in the story-diagram in Figure 2 represent causal relations (whereas the arrows in the argument diagram in Figure 1 represent inferential relations) and thus the events in the story causally explain the evidence in the case.

Abductive inference is a creative process, in which we use patterns of commonsense knowledge combined with observed evidence to form a number of hypothetical scenarios. One aid in the abductive process is so-called *story schemes*, general patterns of events that can serve as a background to particular stories. For example, Pennington and Hastie (1993) present a scheme for intentional actions, a causal pattern of the form *motive goal action consequences*. More specific schemes were given by Schank (1986), who defines

a number of explanation patterns which may help in explaining events (or states) by connecting an event to an explanation that has been used to explain similar events before. For example, the story scheme for 'murder' is of the form *person x has a motive m to kill person y person x kills person y (at time t) (at place p) (with weapon w) person y is dead*. In the Nadia example, the murder scheme may be used to abduce a possible story from the observation that Nadia is dead. The motive *m* would then be the disagreement and the weapon *w* a gun.

Taken by itself, abductive reasoning can seem to take the form of the fallacy of affirming the consequent. However, the apparent fallaciousness disappears if we consider abductive reasoning in the broader context of inference to the best explanation (IBE): not just a single hypothetical story but also alternative scenarios are considered and the best one is chosen. The choice between these alternative stories depends on how well the individual stories explain the evidence and how *coherent* (Thagard 2004) each of them is. The coherence of a story largely depends on whether the story conforms to our general commonsense knowledge of the world, that is, whether we deem the story to be inherently plausible (i.e. without considering the evidence in the case). Here, story schemes play an important role (see Bex 2009). For example, a story is not sufficiently coherent if there are parts missing; the murder story scheme mentions motives *m* and a weapon *w* and any murder story that does not explicitly mention a motive or a weapon will be incomplete and hence less plausible. Furthermore, the causal relations in the story scheme can be used to draw out the (implicit) causal relations in the story based on the scheme; in the murder scheme, the motive causes the action (i.e. the killing), so in a murder story there will also need to be such a causal link. Thus, the causal links can then be further examined and questioned.

The narrative approach is a causal, dialectical way of reasoning with hypothetical stories that explain the evidence in a case. Clearly, this reasoning is defeasible, since additional evidence might give rise to new explanations. Furthermore, the narrative approach has been characterized as *holistic* (as opposed to atomistic), because the stories allow the elements in a case (i.e. events, evidence) to be considered as a whole. An important advantage of the narrative approach is that it is close to how legal decision makers actually think about a case. Experiments by Pennington and Hastie (1993) suggest that when reasoning with a mass of evidence, people compare the different stories that explain the evidence instead

of constructing arguments based on evidence for and against the facts at issue (as is done in the argumentative approach). However, a disadvantage of the more holistic narrative approach is that the individual pieces of evidence do not always have a clear place and the evidence's relevance with regards to the facts at issue cannot be checked easily. Furthermore, it is not always clear how one should reason about the coherence of a story and how stories should be compared.

2.3. The Hybrid Approach

Both the argumentative and the narrative approach concern reasoning about the facts and the evidence: in the argumentative approach, the facts may be proven by justifying them with arguments based on evidence, whilst in the narrative approach the facts are justified by being part of a larger story that explains the evidence Bex (2011) shows that when dealing with complex reasoning in criminal cases both the argumentative and the narrative approach have their own advantages and disadvantages. The argumentative approach, which builds on the philosophical tradition of argumentation, is well-suited for an analysis of the individual pieces of evidence, whilst the empirically-tested narrative approach is appreciated for its natural account of crime scenarios and causal reasoning. Conversely, the atomistic nature of arguments makes them unsuitable for giving an overview of the various hypotheses about what happened in the case and not all aspects of causal reasoning can be found in the argumentative approach. In the story-based approach, the individual evidence does not have a clear place and its credibility and relevance cannot be checked easily. Arguments and stories therefore need to be combined into one *hybrid theory*, where facts are organised into stories and arguments based on evidence are used to support these stories. In other words, a story such as the one in Figure 2 should be *anchored* in evidence using arguments such as the one in Figure 1, viz. Figure 3.
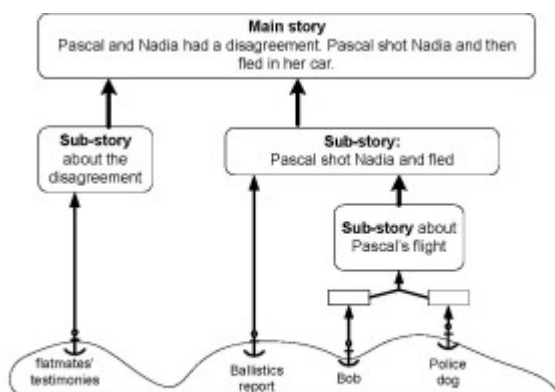

Figure 3: A story anchored in evidence using arguments

In Figure 3 (adapted from Wagenaar et al. 1993)**[iv]**, the main story is anchored in a ground of evidence using arguments, which are based on argument schemes. Note how the main story, which matches a general "kill and flee" scheme, is made up out of sub-stories that match more specific story schemes lower in the hierarchy (e.g. a story scheme about what happens when two people disagree, a "fight" story scheme about what (may) happen when someone flees after committing a crime). Thus, both arguments and stories and their respective schemes have a clear place in the hybrid theory.

The hybrid approach solves one of the most important issues with the narrative approach as, for example, described by Wagenaar and colleagues (1993), namely that often the connection between the evidence and the stories is not made clear. In the hybrid approach, stories can be firmly anchored or, in other terms, *evidentially supported*. Arguments can be attacked, which may break the "anchor's chain", causing the story to be no longer connected to the ground. Note that stories can also be *evidentially contradicted* using arguments. For example, an argument based on a witness statement saying that Pascal was in Poland when the shooting took place contradicts the above story. Aside from anchoring stories in evidence, the hybrid approach also makes it possible to reason about the coherence of a story in a dialectical way, as arguments can be given for the (in)coherence of a particular story or one of its sub-stories. For example, if we take the story in Figure 2, where a relatively harmless disagreement is given as a motive for Pascal shooting Nadia, we could argue against the causal link between the motive and the action by saying that 'normally, people do not shoot other people when they have a disagreement'. This argument can itself be attacked by saying, for example, that 'Pascal is an aggressive person who does not react to stress in the same way other people do'.

In the hybrid theory, stories can be used for constructing intelligible hypotheses about what happened in an intuitive way and arguments can be used to connect the evidence to these stories and to reason about the stories and the evidence in greater detail. In the next section, we will discuss how an anchored story (i.e. a combination of story and arguments) such as the one in Figure 3 can be analysed using a series of critical questions.

3. Critical questions for the hybrid theory: the Nadia van der V. case
Our hybrid argumentative-narrative approach to reasoning about the facts and the evidence gives rise to a number of critical questions that can be asked. These

critical questions can be used to unearth sources of doubt in a total case (i.e. the combination of arguments, stories and evidence) in the same way as critical questions for arguments point to sources of doubt regarding a single inference. In this section, we will list these critical questions and give some examples.

(CQ1) Are the facts of the case made sufficiently explicit in a story?
A case should contain a clearly phrased, sufficiently specified and coherent story detailing "what happened".

The starting point of a well-supported opinion about the facts is a concrete story about what happened, that is, a clear and sufficiently specific chronological account of what (might have) happened in a criminal case. By presenting the story separately from any arguments about its plausibility and the evidence, the coherence of the story can be best appreciated and investigated. In a sense, one can say that this story is the *conclusion* of the argument about the case-as-a-whole (cf. the analysis by Verheij and Bex 2009). Which stories can be the conclusion of a legal verdict is often restricted by formal constraints; for instance, in the Netherlands the factual account of a conviction should match the indictment presented by the prosecution. In the Nadia case, the prosecution's main story was roughly as follows:

Nadia and Pascal had a disagreement about a washing machine and Pascal decided to kill Nadia. He called his work to report in sick and grabbed his Uzi, a small machine gun he had in his room. Pascal then shot Nadia twice, dragged her to the kitchen and killed her by shooting again at close range. Pascal then left the house and fled in Nadia's car.

For now, we regard this (simple) story as a sufficient answer to CQ1 and turn to CQ2.

(CQ2) Does the story conform to the evidence?
a. Is the story sufficiently supported by the evidence in the case?
b. Is the story contradicted by evidence in the case?

One's belief in the truth of a story about what happened must be supported by evidence. A key step is the identification of the *evidential support* that can be given for the elements of a story, that is, identifying the sources of evidence that support the story. In the Nadia case, many events in the story are explicitly supported by evidence: Pascal's colleague testified that Pascal called in sick;

there were bloodstains, bullet parts and shells in the corridor and an Uzi's sawn-off barrel, cartridges and cartridge clip were found in Pascal's room; a telephone conversation between Pascal and his father was intercepted, in which Pascal said that he killed Nadia; a statement by Pascal's father, who claimed that Pascal had told him about a disagreement between Nadia and Pascal and that Pascal went crazy because he had been drinking; witnesses stated they saw someone looking like Pascal drive Nadia's car and scent tests showed Pascal had been in the car (Figure 1). This list of evidence is taken directly from the verdicts, where they are largely listed in chronological story order [v].

In general, not all elements of a story can be supported by evidence. This does not need to be a problem, and is in fact unavoidable as certain story elements must by their nature be indirectly justified. When an element of a story is not supported by a piece of evidence (in a given argument), we speak of an 'evidential gap'. In the verdicts on Nadia's murder, the main evidential gaps seem to be not the events in the story but rather some of the causal relations in the story. For example, exactly why the (seemingly trivial) disagreement caused Pascal to shoot Nadia is at first left unexplained and no evidence is mentioned for the fact that the shooting caused Nadia's death. In some cases, such as Pascal's motives for the murder, these causal relations are dealt with separately below (e.g. when looking at the plausibility of the story, see CQ4). Other causal relations, such as the cause of death, can probably be supported on the basis of autopsy report on Nadia's body, but this is not mentioned in the verdicts because it was no issue in the case. In sum, CQ2 has been satisfactorily answered.

The existence of evidential gaps, here conceived of as parts of a story for which no direct evidence [vi] is available, is one reason why a mixed-argumentative narrative perspective can be useful. The analytical argumentative perspective makes the evidential gaps visible, the narrative perspective shows why the evidential gaps can still be believed in conjunction with other facts. In general, it is a matter of good judgment which elements of a story must be directly supported by evidence and which can be inferred from other facts. This depends in part on the quality of the evidence (a story supported by weak evidence can become stronger by providing evidence for more facts), but also on the nature of the crime and the law.

In addition to looking at how much of the story is supported, one should also consider how much of the total evidence in the case supports the story. If, for

example, a story is completely supported by 2 witness testimonies but there are 20 more witnesses who state another (incompatible) story, the story does not sufficiently conform to the evidence in the case even though there are no gaps in it. Furthermore, one should also take into account the amount of evidence that directly contradicts a story; instead of giving an alternative story (see CQ5 below), the opposing party may simply deny elements of the main story. For example, in the Nadia case the defence might have witnesses that state that there was never a disagreement and that Pascal and Nadia were good friends. In this case, however, such arguments were not made and we turn to the next critical question.

(CQ3) Is the support that the evidence gives to the story sufficiently relevant and strong?
a. Are the reasoning steps from evidence to events in the story justified by warranting generalizations and argument schemes that are sufficiently strong and grounded?
b. Are there exceptions to the use of the generalizations and schemes that undermine the connection between evidence and fact?

In order to determine relevance and probative force of a piece of evidence, the generalizations and schemes warranting the inference steps should be made explicit. Thus it can, for example, become clear that the generalization is false and cannot be the basis for a good reasoning step. In general it will therefore be important to determine whether and, if so, on which grounds a generalization is considered to be valid (i.e. provide the *backing* to the *warrant*, Toulmin 1958). For example, the witness testimony scheme can be grounded in the law (e.g. article 339, Dutch code of Criminal Proceedings says that a witness' testimony is a valid source of evidence). Schemes or generalizations can have other sources than the law[vii]: we often make inferences warranted by generalizations which are based on general knowledge (Cohen 1977). Such generalizations are necessary but also dangerous (Twining 1999), as they might express implicit biases or prejudices we hold (e.g. "a confession is often true", cf. Wagenaar et al. 1993). In the example of the murder of Nadia, we see that most reasoning steps are based on plausible generalizations and schemes. Perhaps the use of scent tests as a basis for drawing conclusions is the most controversial[viii]. If we consider criticism concerning scent tests as a forensic investigative procedure as well founded, then we must conclude that scent tests cannot be used to support conclusions (CQ3a).

With respect to most of the listed pieces of evidence, we need not assume that there are exceptions to the underlying generalizations or schemes (CQ3b) and we can infer the events of the story supported by the evidence. One exception here is Pascal's father's testimony: it might very well be possible that the father is biased when testifying about his own son (critical question 3 for the Witness Testimony Scheme). However, in this case there was also other evidence pointing in the same direction (the intercepted telephone conversations) so it seems that Pascal's father told the truth in this case.

Now that we have considered critical questions 1, 2 and 3, we are in the following position: there is a sufficiently clearly delineated account of the facts (the story), of which as many events as possible have evidence supporting them, and of which the relevance and strength has been established as well as possible. The argument about the case as-a-whole can be further improved by showing that the story is plausible in itself.

(CQ4) Has the story itself been sufficiently critically assessed?
a. Is the story sufficiently coherent? Are there required elements missing? Are there implausible events or causal relations? Is the story inconsistent?
b. Have story consequences been used to test the story?

First, the story's *coherence* must be examined (CQ4a). Here coherence has a specific meaning, namely that the story fits our knowledge and expectations about the world we live in. In other words, a story should be *complete* (i.e. have all its essential parts) and *plausible* (i.e. have plausible causal relations). In section 2.2 it was already argued that story schemes play an important role in determining a story's coherence; completeness, for example, is relative to a particular scheme. A story should also be *consistent*; for instance, when the story implies that the suspect was simultaneously at two different places it is incoherent.

Something that at first sight is implausible in the story about Nadia's murder is the assumption that disagreements over the washing machine led Pascal to murder Nadia. In other words, the relationship between the motive (the disagreement) and Pascal's action (murdering Nadia) is implausible. No reasonable person would assume that disagreement over washers and driers commonly leads to an intention to murder someone. However, in its decision, the court of appeal inadvertently elaborates on Pascal's tendency to react rather violently in response to what most consider to be futile causes. In the decision, a

psychiatric report is discussed; it is used to provide support for the decision to keep Pascal under psychiatric surveillance. The report explains that Pascal has a disorder by which ordinary events make him feel seriously threatened and react with disproportionate violence, which makes the events surrounding the death of Nadia and its cause more credible. This shows that a seemingly incoherent story can still be believed when supported by evidence.**[ix]**

A further way of testing a story is to look for possible reasons against facts that follow from the story (*story consequences*, CQ4b). For example, if we assume that the perpetrator, whoever it may be, has shot Nadia at close range and that he has subsequently dragged her body to another place, it is highly likely that he has blood on his hands, clothes and shoes. If the offender then stepped into her car, there should be traces of Nadia's blood in or on the car. The ruling of the court stated that there was blood on the door lock and the floor mat on the driver's side of the car; a comparative DNA analysis showed that the profiles of the blood found in and on the car matched Nadia's profile.

In sum, the prosecution's main story seems sufficiently coherent and CQ4 gives no problems. However, besides the critical assessment of the main story, the conclusion of the argument in the case as-a-whole, sufficient attention should also be paid to possible alternative scenarios of what has happened.

(CQ5) Have alternative stories been sufficiently taken into account?
a. Has a sufficient search for alternative explanations been performed, not only in the investigative phase, but also in court?
b. Are there good reasons to choose one story over the alternatives? Have the alternatives been sufficiently refuted?

First a serious search for alternative scenarios is needed. In part, the opposing party in the process will provide alternatives, but a decision maker will also have to actively consider different accounts of what may have happened. These alternatives should not only be actively sought, they should also be adequately refuted: essentially, all the critical questions that can be asked for the main story also have to be asked for the alternatives.

In the Nadia case, Pascal told the alternative story that he was suffering from amnesia and could not remember what happened the day Nadia died. He claimed to have been kidnapped and taken to Poland, although by unknown persons and

for unknown reasons. This can hardly be considered a story (cf. CQ1 that requires a sufficiently specific account of the facts), but as an argument against the prosecution's story that is not necessary: such a refutation can take the form of a simple claim (supported by evidence) that the suspect was somewhere else than at the scene of the crime. However, it makes the suspect's case stronger when he can present a well-supported and coherent story. In the present case, Pascal's story is not nearly as coherent and well-supported as that of the prosecution. Several crucial elements are missing (*completeness*, CQ4a), such as the identity and motive of the kidnappers. Furthermore, there was no evidence of the kidnapping having taken place (CQ2). Also, the court explicitly addresses the amnesia defence: it states it does not believe Pascal, because Pascal has never sought medical help for his alleged amnesia. Thus, the court explicitly refutes Pascal's alternative (CQ5b).

Finally, a general caveat is in place: any conflicting reasons must be weighed.

(CQ6) Have all opposing reasons been weighed?
Have all considerations that are used to weigh opposing reasons been made explicit? Has this been done both at the level of individual facts and events and at the level of stories?

For example, if two witnesses make opposite statements about the presence of the suspect, both statements provide a reason, one supporting the suspect's presence, the other against. When there are explicit grounds that can decide the weighing of such opposing reasons, they should be given. The stronger and more relevant the reasons are, the more important it is to decide explicitly how they are weighed against each other. Conflicting reasons do not only exist at the level of individual events, but also at the level of stories. For example, there might be reasons for and against a story as a whole. It can occur that significant elements of a particular story are supported by evidence, while the story itself is rather incoherent. The weighing of reasons then takes the form of deciding whether the story is sufficiently justified by the evidence and how it measures up to the alternatives.

In the Nadia case, there was no difficulty in the balancing of reasons at the level of stories. Pascal's "story" was so implausible and badly supported that it could be considered as refuted by itself, even without considering the plausible and well-supported story of the prosecution. There was no need to weigh any reasons on

the level of individual events, as no arguments were given that directly refuted any of the arguments of the prosecution.

4. Conclusion

In this paper, we have proposed a series of critical questions for the hybrid argumentative-narrative theory of reasoning about the facts and the evidence in legal cases. Some of the critical questions correspond closely to argumentative approaches to reasoning with evidence (in particular critical question 2 about the sufficient support of the events, and question 3 concerning the relevance and strength of the support). There are also questions that are strongly connected to a narrative style of analysis (in particular question 4 about the coherence of the supported story, and question 5 about the consideration of alternative stories). But there are also questions that have a more hybrid position between argumentation and narrative. For instance, critical question 1 requires that an argument about the facts has a specific story as a conclusion, and question 6 considers the weighing of the pros and cons for individual events and for complete stories.

We have used the analytic tool of the critical questions associated with argumentation schemes as studied in argumentation theory (recently by Walton et al 2008, building on work by Perelman and Olbrechts-Tyteca 1958, Hastings 1963 and Kienpointner 1992). We have extended the use of critical questions to questions for stories and the schemes on which they are based, and for hybrid structures of arguments, stories and evidence.

One of the lessons learned from the work on the hybrid theory is that stories and arguments are essentially "communicating vessels": when dealing with the complex reasoning involved in large criminal cases, a narrative approach works best for some points of a case, while in other instances an argumentative approach is most natural. However, for a deeper understanding of the connection between argumentation and narrative, it seems to be required to develop a genuine integration of both. Meanwhile, our hybrid approach allows for the flexibility of the separate argumentative and narrative approaches whilst at the same time it uses arguments and stories as complementary tools for complex reasoning. The case studies in this text and another one by Bex (2011) accentuate the value of a hybrid, argumentative-narrative analysis of reasoning about the facts in criminal cases.

NOTES

[i] We use the term "fact" in its juridical sense, that is, descriptions of states or events the truth of which is currently unknown and has to be proven (cf. *facta probanda* or *facts at issue*, Anderson et al. 2005). Thus, reasoning about the facts is essentially determining "what happened" in the case. With "evidence" we mean the *evidential data*, the primary sources of evidence the existence of which cannot be sensibly denied (e.g. witness statements made in court, forensic expert reports handed to the jury). Evidence and facts should not be confused: the existence of the evidential data does not guarantee the truth of the fact evidenced. For example, that there is a testimony by a witness who saw the suspect jump into a car does not guarantee that the suspect jumped into a car (the witness might lie or he might confuse the suspect with someone else).

[ii] Bex and Verheij 2009 was written in Dutch and specifically aimed at legal professionals. In this paper, we have adapted the critical questions and example case for an academic audience.

[iii] In the Netherlands the judges are required to provide a written verdict in which their considerations are summarized. Many of these verdicts are available to the public on Http://www.rechtspraak.nl. The verdicts in the Nadia van der V. case are available (in Dutch): LJN AO3150 (court of Utrecht) and LJN AT5190 (court of appeals Arnhem).

[iv] Wagenaar, van Koppen and Crombag (1993) propose the theory of anchored narratives and use it to explain 'dubious cases', i.e. possible miscarriages of justice. Verheij (2000) draws analogies between this approach and argumentative approaches and Verheij and Bex (2009) have reconstructed the theory in terms of argumentation schemes. Our Figure 3 is similar to the one by Wagenaar, van Koppen and Crombag (1993, p. 39), but there is a crucial difference between our figure and that of Wagenaar et al.: we use the evidence as the firm ground to anchor onto, whereas in anchored narratives theory commonsense generalizations provide the anchors.

[v] Pennington and Hastie (1993) have shown that the chronological ordering is more convincing than an arbitrary ordering.

[vi] There is theoretical discussion about the nature and existence of direct evidence, see for instance Anderson, Schum and Twining (2005), pp. 62-63. For our purposes, it suffices to note that we consider an event to be directly supported when there is a direct, argumentative (evidential) chain of reasoning from evidence to the event.

[vii] Freeman (2006) has provided a classification of types of warrants based on

epistemic considerations. He distinguishes *a priori*, empirical, institutional and evaluative warrants.

[viii] The tests raised controversy in another well-publicised Dutch case, namely the socalled Deventer Moordzaak.

[ix] It is important to emphasize that the decision about the belief in a story must first and foremost depend on the evidence available and not the story's coherence, that is, a "good" story should never be preferred to a "true" story (Bennett. and Feldman 1981).

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