Arguing with Stories

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Abstract. Stories can be powerful argumentative vehicles, and they are often used to present arguments from analogy, most notably as parables, fables or allegories where the story invites the hearer to infer an important claim of the argument. Case Based Reasoning in Law has many similar features: the current case is compared to previously decided cases, and in case the similarity between the previous and current cases is deemed sufficient, an similar conclusion can be drawn for the current case. In this article, we want to take a further step towards computationally modelling the connection between stories and argumentation in analogical reasoning. We show how story schemes can be used to investigate and determine story similarity, and how the point of a story – that is, the conclusion that the storyteller intends the hearer to draw – can be likened to the *ratio decidendi* in a legal case. Finally, we present some formal tools for modelling stories based on computational models of practical reasoning.

Keywords: Argumentation, Stories, Analogy

1   Introduction

Stories[1] can be a powerful vehicle of persuasion. They can be used, for example, to present evidence about "what happened" in a particular case in a coherent and believable way (Wagenaar et al. 1993), or to convince others to follow a particular course of action (Bex et al. 2014). A story does not persuade by imparting explicit rules, but instead by exposing a coherent narrative aimed at changing or reinforcing attitudes, whereby the stories illustrate various group cultural norms. Many folktales are of this type, as are many children's stories. In some genres, such as fables and parables, the main purpose

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[1] We make a distinction common in literature theory, namely between the *story* and the *discourse* of a narrative (Toolan 2001). A story as discussed in this article is the (abstract) sequence of events. The discourse, issues related to which we do not discuss here, is the way in which a story is presented and the medium used (i.e. images, text, figures, film).

of the story is to support the conclusion. In fables, especially, the lesson is often made explicit by a "moral".

Much of our previous work on stories and argumentation (e.g. Bex et al. 2010) focuses mainly on arguments about stories: arguments based on evidence are used to reason about the plausibility of a story. However, it is also possible to use a story as an argument, that is, propose the story itself as a reason for some conclusion (Bex 2013, Bex et al. 2014). Stories can be told with a variety of purposes and whether a story should be considered as an explanation, as a source of entertainment or as an argument depends not just on its structure but also on the intention of the author or speaker. This idea stems from speech act theory (Searle 1969): it is the intention of uttering some locution – the *illocutionary force* of the speech act – that determines how the contents of the speech act should be treated. So if a story is told with the intention of persuading or arguing, we can consider it to be an argument, a reason for a conclusion, whereas if it is told with the intention of explaining we can consider it to be an explanation (Bex & Walton 2016)[2]. There are often strong clues as to the speaker's intention from the context. The conversation preceding the story is often important, while the way the conversation continues following the story can show how the hearer has understood the story: this may be endorsed or challenged by the speaker. This is particularly true of parables in the Gospels, which are usually told in a context that helps to indicate the intended point. In fables the explicit "moral" fulfils this function.

Stories are often used to present arguments from analogy[3], most notably as parables, fables or allegories where the story invites the hearer to infer an im-

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[2] The intention can be inferred from the context in which the story is told. If it is delivered as part of a persuasion or deliberation dialogue (Walton and Krabbe 1995), it will normally be an argument. While the story in itself may not indicate the intention of the narrator, stories are typically told in a context. The parables, for example, are always placed in a context, which is important to their understanding. Of course, the hearer may misjudge the context and so fail to understand the story properly, but this is a danger with any speech act.

[3] Like analogies, a single story can suffice to establish the conclusion. In contrast argument from example requires the cumulative impact of many examples. A similar distinction can be made between reasoning with legal cases, where a single precedent is, if sufficiently authorative, enough, and knowledge discovery, where the degree of support depends on the number of examples found in the dataset.

portant claim of the argument. For example, the New Testament parables, Aesop's fables or Plato's allegories are stories which are meant to persuade us of certain ideas by appealing to, or challenging, our core beliefs and values. Similarly, thought experiments like Searle's Chinese Room (Searle 1980), intended to direct the intuitions of their audience, are often also presented as a small anecdote or story.

Analogical reasoning, where two stories or cases are compared, has been investigated formally in the field of Case-based Reasoning (CBR) (Gentner& Forbus 2011), and ideas from this early work were also used in approaches to legal CBR (e.g. CATO, Aleven 1997), which adds argument moves to explore the similarities and differences between legal cases. Any legal case can be presented as a narrative, and the presentation will allow different facts to be selected and emphasised and different glosses given to explain behaviour or complete gaps in a way which will support the interpretation desired by the narrator. In recent work, we have shown how the legal and the factual level in a case can be mapped onto each other (Bex & Bench-Capon, 2015), and how argument moves about similarity developed in the legal context can also be applied to factual stories (Bex et al. 2011). However, what remains to be investigated is how stories can be used in a broader argument: that is, how similarities between stories can be persuasive.

In this article, we want to take a further step towards modelling the connection between stories and argumentation in analogical reasoning. Section 2 shows how arguments from analogy can be based on stories, and sections 2.1 through 2.3 then discuss some of the objections to and difficulties of integrating stories and arguments. Section 3 sketches the kind of computational structures that will be required to implement this approach. Section 4 discusses some leading related work before Section 5 offers a short conclusion.

2   Arguments from Analogy

Much of our everyday reasoning is based on analogy, and hence there is a lot of literature (in philosophy, logic, law, AI) dealing with argument from analo-

gy[4]. Basically, the argument from analogy works as follows. First, a source case is presented that appears to suggest a statement A as its conclusion; here, the source case is the reason for conclusion A, an argument in itself. Then a target case is presented, one that appears similar to the source case in some relevant ways, and the aim of the argument is to get the respondent to accept the same conclusion, or a parallel one, *mutatis mutandis*, in the target case. Figure 1 illustrates these various steps.
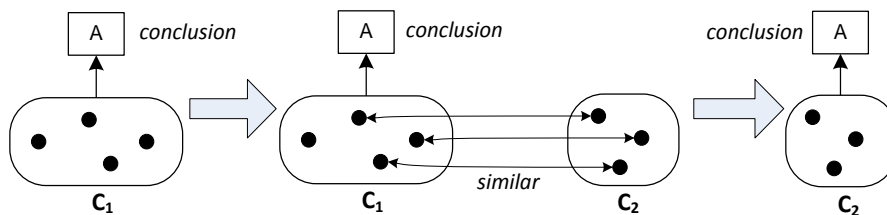
Figure 1: Drawing the same conclusion from a similar case

The argument scheme on which we base our investigations in this paper is a slightly amended version of the one presented by Walton (2012).

> *Similarity Premise*: In some important respects, case C_1 is similar to case C_2.
> *Base Premise*: From C_1 it can be concluded that A is true (false).
> *Conclusion*: From C_2 it can be concluded that A is true (false).

The difference with the original scheme is that whereas Walton's scheme has the base premise/conclusion "A is true in C_1/C_2", the current scheme correctly positions A as being a conclusion that is drawn from a case: the case does not strictly entail the conclusion, and it does not pose its conclusion as a norm. Rather it invites the hearer to draw the conclusion, so that its force is always persuasive, never coercive[5]. This makes the form of the presentation signifi-

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[4] For example, The Stamford Encyclopaedia of Philosophy Staes :"Analogical reasoning is fundamental to human thought and, arguably, to some nonhuman animals as well. Historically, analogical reasoning has played an important, but sometimes mysterious, role in a wide range of problem-solving contexts. The explicit use of analogical arguments, since antiquity, has been a distinctive feature of scientific, philosophical and legal reasoning. "

[5] Note that, in theory, we can "coerce" our audience into drawing a particular conclusion if we succeed in preemptively defeating all other possible conclusions that might be drawn from the story. However, it is like a defeasible rule: if it were possible to exclude *all* exceptions, we would have a strict (coercive) rule, but it isn't so we don't. Similarly stories can try to preempt alternatives, but can never preempt them all.

cant: an attractive story makes drawing the desired conclusion all the more enticing. In arguments from analogy, there is usually a point one wants to make, as simply comparing cases is not very interesting, unless there is some purpose to it. That A can be regarded as a conclusion is also evident in the critical questions for the scheme (left unchanged from Walton's work).

CQ1: Are there respects in which C_1 and C_2 are different that would tend to undermine the force of the similarity cited?

CQ2: Is A the right conclusion to be drawn in C_1?

CQ3: Is there some other case C_3 that is also similar to C_1, but in which some conclusion incompatible with A should be drawn?

The use of the scheme is as follows. The story acts as C_1, and the hearers map elements of their own situation to form C_2. This means that the conclusion to be drawn from the story becomes applicable to them. For example in the fable of the *Ant and the Grasshopper*, the hearer should see their own behaviour as matching that of the grasshopper, and learn from the story that they should become industrious like the ant.

2.1 Story Similarity

Stories are finite sequences of facts, events or states of affairs. Different stories can be seen as being similar for various reasons. For example, they may have the same subject, or a similar structure and themes.

The comparison of cases has been investigated formally in AI in the field of Case-based Reasoning (see Gentner & Forbus 2011 for an overview). The computational process of analogising in CBR usually consists of the following steps. First, given base case C_1 a target case C_2 is retrieved and a mapping is constructed. This mapping consists of a set of correspondences, each linking a particular item in the base with a particular item in the target. This is like the story case described above, where the story, like the precedent, is mapped into the current situation, so that it can be applied to it. This mapping can also contain candidate inferences, surmising what is true in C_2 based on projecting the structure of C_1, and an evaluation score which indicates the extent to which the two cases are similar. The results of the comparison of C_1 and C_2 may then be generalised and stored as an abstract schema, and in the final step one or both of the cases may be amended to provide a better match.

In (Bex et al. 2011), we presented a model of story similarity which is based on this earlier work combined with insights from the well-known work by Schank and Abelson (1977) as well as work on legal CBR (Aleven 1997). In our work, we distinguish *stories*, specific sequences of events, and *story schemes*, general scenarios consisting of general roles (Propp 1968) that elements of a story can fulfil. Stories can be matched to schemes by assigning the facts to their respective roles, and two cases are thus said to be similar if they can be matched to the same story scheme. Thus, analogising in (Bex et al. 2011) is similar to mapping two cases directly without an intermediate story scheme as in (Gentner & Forbus 2011), but a scheme allows us to match two similar cases C_1 and C_2 even if not every element of C_1 maps to an element of C_2 (as long as the elements of C_1 and C_2 match a story role in the scheme).
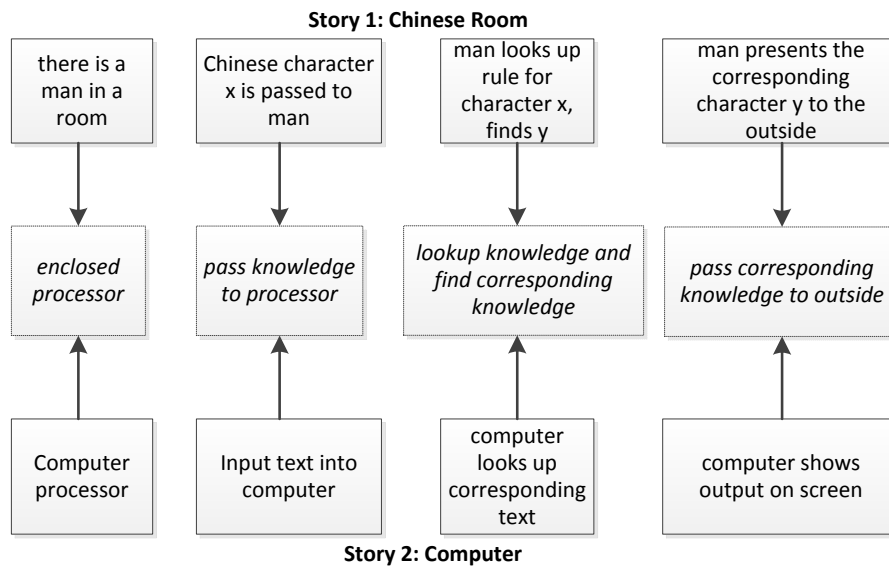
As an example of story similarity, consider the story in Searle's Chinese Room Argument (Searle 1980)[6]. The story supposes that a man, who knows no Chinese, is locked in a room, and that he has sets of rules for correlating sets of Chinese symbols with other sets of Chinese symbols in a meaningful way. People outside the room cannot see what is in the room but they can pass pieces of paper with questions in Chinese through a slit. The man will look up the characters on the piece of paper and write the appropriate answer (as given by his rules) on another piece of paper and pass this back to the person outside. Thus, from the point of view of somebody outside the room in which the man is locked, his answers to any questions are absolutely indistinguishable from those of native Chinese speakers.

Searle's point is that, even though the "room as a whole" might (and, it can be assumed, does) pass the Turing test, the man in the room clearly does not understand Chinese. Searle makes this point to then draw the analogy from the Chinese Room to a computer: if you give a Chinese character, or any knowledge unit for that matter, to a computer all it does is perform a lookup operation without understanding the knowledge.

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[6] Interestingly, in his 1980 article 0Searle uses the Chinese Room experiment to argue against Schank and Abelson's (1977) work on story understanding, which he regards as the paradigmatic example of strong AI.

The argument associated with the Chinese room thought-experiment is now as follows. First, the story about the man in the room is posed and compared to a similar story about a computer performing lookups. This comparison can be modelled by way of an intermediate story scheme as in (Bex et al. 2011), which is illustrated in Figure 2. Once the two stories are matched, we can take the conclusion of story 1 (i.e. "the man is not using any intelligence even though the room exhibits apparently intelligent behaviour") and draw a similar conclusion from story 2 (i.e. "the computer processor is not intelligent even though the computer exhibits apparently intelligent behaviour").

Story 1: Chinese Room

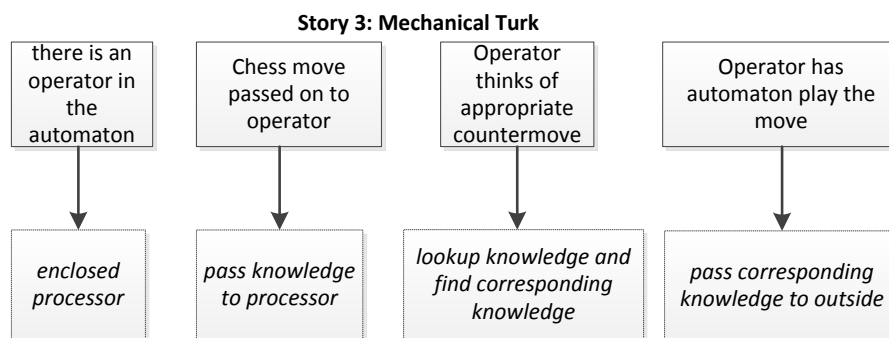| there is a man in a room	Chinese character x is passed to man	man looks up rule for character x, finds y	man presents the corresponding character y to the outside
enclosed processor	*pass knowledge to processor*	*lookup knowledge and find corresponding knowledge*	*pass corresponding knowledge to outside*
Computer processor	Input text into computer	computer looks up corresponding text	computer shows output on screen

Story 2: Computer

Figure 2: Chinese Room Argument: matching two stories to a scheme

Legal Case-based Reasoning such as (Aleven 1997) takes a similar approach to (Gentner & Forbus 2011), but makes the identification of relevant similarities and differences between legal cases the subject of argumentation. For example, one can argue that a story does not match the scheme established by the precedent (CQ1, known as *distinguishing* in the legal context), or one can present another story as a counterargument to the original argument (CQ3). CQ2 is not relevant to legal CBR since the conclusion is the decision given in the precedent, which is a matter of record beyond dispute.

Whilst in (Bex et al. 2011) the focus is on factual stories instead of legal cases, it is still possible to use the argumentative moves of (Aleven 1997) to ex-

plore similarities between stories. Take, as an example, a third story as a counterargument to the original argument. In case of the Chinese Room, one is reminded of the original Mechanical Turk, a chess playing automaton in the 18th century. Everyone thought the machine was intelligent until it was revealed to have human operator hidden within it. Figure 3 shows that this story can also be matched to the same story scheme as the Chinese Room and the computer story in Searle's thought experiment. With this story we can argue that intelligence *is* possible for a machine: no-one disputes the intelligence of the operator of the Turk. The argumentative process can continue further after this: it can be argued that the Mechanical Turk story is different because the operator thinking of the appropriate counter-move is not a lookup operation like a computer or the man in the Chinese Room performs (*distinguishing the precedent*). This distinction can perhaps be countered (*downplaying a distinction*) by arguing that chess players (like the operator) actually systematically consider multiple options they know from experience of previous games and thus perform what one might call a "lookup operation". Few people, however, believe that you can (currently at least) play chess (after the opening) by simply looking up responses: there are too many positions to be considered. In this case the plausibility of the look up table existing is less than the possibility of an intelligent machine.

Story 3: Mechanical Turk

there is an operator in the automaton	Chess move passed on to operator	Operator thinks of appropriate countermove	Operator has automaton play the move
enclosed processor	*pass knowledge to processor*	*lookup knowledge and find corresponding knowledge*	*pass corresponding knowledge to outside*

Figure 3: Matching the Mechanical Turk story to the same scheme as the Chinese Room

Note that the original story can be told in such a way that possible future counterarguments based on critical questions are pre-empted. This can be seen in a Parable like the Good Samaritan (Luke 10:29-37), which Jesus tells to provide an answer to the question *who is my neighbour?* Jesus tells of a man who is robbed and beaten and left at the side of the road. In the course of the

story, some expected answers to the question (my co-religionists, my countrymen) are mooted and dismissed as the priest and Levite pass by on the other side, before the correct answer *any human being who shows compassion –* even my religious and national enemy – is provided in the person of the Samaritan. In this way two of the possible responses which might have led to CQ3 are proposed and dismissed, so there is no opportunity to counter with, for example, the story of the Good Priest.

Contrast this with Aesop's fable the *Ant and the Grasshopper*. In that fable the grasshopper sings through the summer while the ant toils to build up a surplus. When winter comes, the grasshopper is starving and begs the ant for some food. The ant refuses. In La Fontaine's version he tells the grasshopper that having sung throughout the summer, he can now dance. The lesson is obvious: work hard and look to the future (Bex et al. 2014).

However, the simple narrative does offer scope for continuations to provide CQ3 objections. Suppose the ant laughs so hard at La Fontaine's little joke that he chokes to death[7]. Now the moral is different: perhaps *gather ye rosebuds while ye may*. To subvert the original message even further suppose the grasshopper is next of kin to the ant and inherits his stock of food. Now perhaps *he who laughs last laughs longest* is the moral to be drawn.

Or we could change the story itself so that the ant behaves like the father in the parable of the prodigal son[8] rather than the elder brother, and opens his stores to the grasshopper. There is no obvious moral, but the encouragement to be generous rather than judgemental is clear in this variation.

2.2   Drawing Conclusions from Stories

An important question is: how can we draw a conclusion from a particular story? In legal CBR, there are legal rules and principles that allow us to infer the conclusion from the factors in a case (Prakken & Sartor 1998). For stories, we need to look at their *point* (Bex 2013). Stories are often told to make a point, and it is this point that can be regarded as the conclusion of a story told

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[7] Cf. the parable of the Rich Fool in Luke 12:13-21.

[8] Luke 15:11-32.

as an argument[9]. But what kinds of points are often made using stories? And, perhaps more importantly, how do we establish the point of a particular story?

Often the point has to do with a "twist in the tale", which adds persuasiveness to the story[10]. Wilensky (1982) calls these *internal points*, parts of the story text that generate interest. This dramatic content or twist in a story can be found by looking at deviations from "normal behaviour" by characters in the story. For example, the original audience may have expected the Samaritan to leave the man or even steal his remaining clothes (because of the enmity between Samaritans and Judeans), but instead the Samaritan shows compassion and goes beyond what is normally expected in such situations.

Story schemes play an important part in establishing the dramatic content: it is a deviation of the standard script that counts as a twist in the tale. In the case of Searle's Chinese room story, for example, the Chinese Room satisfies the Turing test. Our standard script is that if something satisfies the Turing test, it can be said to be intelligent. Searle's dramatic twist is then that there is actually no intelligence being engaged even with a human inside.

So the dramatic story content plays an important part in establishing the point of a story; "neutral" stories, in which there is no dramatic resolution to some central event, are often regarded as pointless[11]. With respect to such content it is also important to take the intention of the narrator and the knowledge and beliefs of the audience into account. Story schemes are part of our knowledge and influence when we think something is "normal" and when we think a story "has a twist". Thus, deeply entrenched beliefs influence the point that people read in a story. Furthermore, an audience will identify more with a character who is in a similar situation or who has a similar worldview. If we

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[9] In fables the point is usually made explicit in the form of the moral. In parables the point is often not made explicit, but can be inferred from the context: for example the parable of the Good Samaritan is told in repose to the question "Who is my neighbour?"

[10] Such twists are much more common in stories intended to persuade – to lead to a *change* of attitude, such as parables, than stories intended to reinforce existing attitudes, such as fables.

[11] Fables seem to rely on their charm, and the fact that the leading roles are typically taken by anthropomorphic animals. This, their suitability for illustration, and their unchallenging messages all mean they are nowadays usually presented to children rather than adults..

tell the parable of the Good Samaritan to someone with no knowledge of the context (of the enmity between Judeans and Samaritans), it will have less impact because the point of the story will be less clear.

It is also important to take the intention of the narrator into account when determining what the point of a story is. As was briefly indicated above, the intention of the narrator (as represented by the illocutionary force of the speech act(s) of telling the story) influences how a story should be interpreted: a story may be told with the intention of explaining, arguing and so forth. This intention may depend on the dialogical context in which a story is told (Reed 2011, Bex & Bench-Capon 2014)). For example, Jesus tells the story of the Good Samaritan to answer the question "Who is my neighbour?" Now, if like Schank et al. (1982) and Bex & Walton (2016) we interpret the point of the story to be the intention of the narrator, the point of Jesus telling the story is to answer the question, and to provide a reason for the answer.

In sum, the point of a story is the interaction between the structure and contents of the story and the knowledge and beliefs of the reader. The story teller intends the story to have such an interaction and thus change the beliefs of the reader in a particular way.

2.3 Story points and legal *ratio decidendi*

The point of a story can be compared with the *ratio decidendi* of a legal case. The *ratio decidendi*, literally the reason for the decision, is the basis on which the case was decided, and hence the rule which will be binding on other decisions in future. This contrasts with the *obiter dicta* (other statements) which are observations which may have persuasive but not binding force on subsequent cases. Rarely, however, is the *ratio* made explicit in the decision itself, giving rise to two positions. One is that the case does have a *ratio* associated with it, which can be discovered by a correct interpretation of the decision. This view is encouraged by the use of headnotes, which offer such an interpretation, and which usually include a *ratio*.

The other view is that the *ratio* is not fixed, but is capable of reinterpretation in the light of subsequent cases: the task of the legal interpreter being to make sense of a whole body of case law, considered hermeneutically. On this view

the *ratio* of a case may turn out to be other that was originally thought, if this is necessary to make it cohere with later decisions.

We find interesting parallels with the kinds of stories we have been considering. Fables tend to look like the first kind of view: their point is usually clear and often explicitly stated as the moral of the fable. Other stories, such a parables, may be less clear, and require interpretation. And these interpretations may change, either in response to different social contexts, or in order to achieve coherence with other parables. Also it is often said that a parable should have a single point. This does not prevent preachers from drawing additional lessons from the *obiter dicta* of the parable[12].

3 Formal Tools for Modelling Stories

In Bex et al. (2014), we have presented a formal, computational framework for modelling stories. We argue that because a story can be seen as a sequence of events, in particular where that sequence is a selection from a number of possible events, a natural computational structure for exploring stories is a state transition diagram. State transition diagrams come in a variety of forms, but at their simplest comprise a series of states linked by actions possible in the state, indicating the state that will be reached if the action is performed. Consider the *Ant and the Grasshopper* fable. The scenario can be represented as the State Transition Diagram shown in Figure 4.

Now the *Ant and the Grasshopper* fable becomes two different paths through this diagram: the ant takes A1 followed by A3, while the grasshopper takes A2, A4. Someone might object that the ant would be generous and so the sequence would be A2, A5, A3, but this would receive the reply "ants don't behave that way", or "it would not be wise to trust to the generosity of others." At the very least the grasshopper risks ending in Q3. Note that the diagram serves to circumscribe what is possible: if we want to allow for the ant dropping dead we would need a transition A6*: has apoplexy* leading to a new state Q4 (dead, food plentiful, food stock). The point of the story is that Q3 is a clearly undesirable state which one should avoid, and so one should choose

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[12] For example the parable of the Prodigal Son is often used to make points based on the response of the elder brother.

A1 rather than A2 in Q0, and so avoid even the possibility of reaching of reaching Q3.
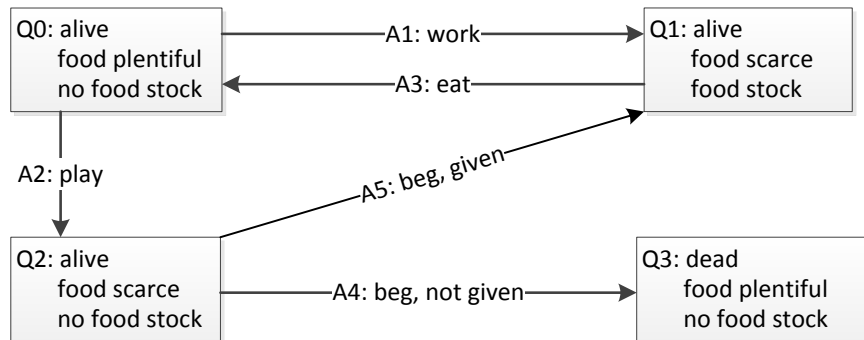
Figure 4: State transition diagram for The Ant and The Grasshopper

This simple state transition diagram serves for a simple story such as the *Ant and the Grasshoppe*r. For more complicated stories, such as the Good Samaritan, we would need a richer diagram. For example the Action Based Alternating System with Values proposed in (Atkinson & Bench-Capon 2007) enables us to explore the effect of interactions between several agents, and explains the desirability or otherwise of various states by labelling the transitions with the social values promoted and demoted. This can be used to reason about the motives of the agents concerned in terms of the ordering agents put on these values (Bex et al. 2014, Bex & Bench-Capon 2014). For the Good Samaritan the value labelling would suffice to enable us to represent the different preferences of the people involved, and so recognise that our current preferences (assuming we share the preferences of the brother) are less than ideal. For the remainder of this paper, however, we will focus on the simpler case of the different paths through the simple transition diagram shown in Figure 4.

To return to the *Ant and the Grasshopper* we need five components:

- A set of propositions: in this case the three propositions: agent is alive, food is plentiful, agent has food.
- A set of states, one for each possible assignment of truth values to these propositions (Q0-Q3 in Figure 1). By convention Q0 is the current or initial state.
- A set of actions: A1 to A5 in Figure 1.

- A set of preconditions defining which actions are available in each state
- A transition function stating which state is reached when an action is executed in a given state.

The preconditions and transitions can conveniently be represented as a transition matrix or read from the diagram.

The AATS with values additionally requires a set of agents, a set of joint actions constructed from the actions of the individual agents, a set of values, and a function to related promotion and demotion of values to transitions.

A story scheme is now a particular path through a transition diagram. In order to be able to argue from analogy we need to augment the story schemes with an ontology. Clearly any animal at all can play the role of agent in the transition diagram of Figure 4. Therefore we could have told the fable about any pair of animals. The ontology required to support fables will focus on animals, and will associate them with stereotypical properties (owls are wise, foxes are cunning, ants are industrious and grasshoppers are frivolous etc). Another suitable pair could have been selected from the ontology: for example if we prefer to use mammals rather than insects, we may say squirrels are industrious and hares are frivolous, so that we could tell the fable of the *Squirrel and the Hare*. As far as the story scheme is concerned, this will mean that in addition to the transition diagram and the path through it, we will add the associated qualities of the agents following a given path.

To deploy the fable in argument we need to find a context in which we are trying to persuade someone who is frivolous to be industrious. Thus the match which triggers the use of the diagram will be on the contrasting qualities of the animals in the story. The point will then be grasped by the audience if they:

1. identify themselves with the grasshopper, either on the basis of the attribute, or simply because they prefer to play rather than work:
2. recognise that the situation reached by the grasshopper is undesirable and needs to be avoided
3. realise that it can be avoided by adopting the qualities (or at least the behaviour) of the ant.

4 Related research

The connection between stories and arguments has been explored in more informal models of argumentation and reasoning. Walton (2012), for example, has explored the required similarities between stories and arguments from analogy. Govier and Ayers (2012) argue that stories can be presented as arguments in themselves. They use the Good Samaritan as an example, setting out the argument that they reconstruct from the story Their reconstruction requires them to include some additional, "implicit" premises. These are shown in italics.

1. *If supposedly holy people (the priest and the Levite) were to ignore an unknown and needy person on a road, they would not treat that person as a neighbour.*
2. If a person who was of no special status and did not know an unknown and needy person on a road were to treat him with mercy and kindness, that person would treat the needy person as a neighbour. So
3. What matters about being a neighbour is not one's status or one's prior knowledge of a person.
4. What matters about being a neighbour is treating another with mercy and kindness when that person is needy and one encounters him.
5. *It is good to treat a needy stranger as a neighbour if one encounters him.* Therefore,
6. *One should treat other people, when they are in need and one encounters them, as one's neighbours with mercy and kindness.*

In this reconstruction of the Good Samaritan, two crucial premises and the conclusions are said to be implicit: that is they are not present in the parable, but supplied by Govier and Ayers. The addition of premise 1 is perhaps not important: it simply explains the role of the priest and the Levite, which are not really central to the argument anyway. The addition of premise 5 is more contentious because it transforms the nature of the argument. Without premise 5 it is a classification argument with a factual conclusion - the Samaritan is neighbour to the traveller - which was the conclusion drawn by the lawyer to whom Jesus told the parable in Luke 10:36. Premise 5 turns it into an argument with a normative conclusion, advocating particular behaviour. This is perhaps justified by the comment 'Go and do thou likewise' made by Jesus in

Luke 10:37, since this shows that the intention in telling the parable is to affect future actions.

Whilst Govier and Ayers' reconstruction is interesting, we contend that the point of the parable is not to impose a norm, but rather an invitation to adopt different attitudes, to recognise that duties between people arise from their common humanity rather than any social or religious ties. This will lead people to act in accordance with the norm, but motivated by a 'change of heart' which makes them want to act properly, rather than recognition of, and compliance with, a norm (as was already argued in section 2). Certainly the Samaritan is acting because he is the sort of person he is, not because he wishes to comply with a norm not acknowledged by the priest and the Levite.

The correct argument, in our view, is as follows:

1. Conventional attitudes would lead to the traveller being left for dead.
2. The traveller shouldn't be left for dead.
3. Someone with the Samaritan's attitudes would help the traveller
4. Therefore you should adopt the Samaritan's values

In contrast with Govier and Ayers' reconstruction, this argument has a clear analogical component (Samaritan has attitude a leading to positive results, so you should also adopt attitude a). However, in order to make this argument more concrete we need a detailed account of the internal reasoning, the deliberations of the Samaritan, the Levite and the Priest. We believe that the computational model sketched in section 3 is the first step towards such an account: once we have the AATS with values of a story, we can generate arguments for the various choices of the characters according to their values and their preferences between these values..

5   Conclusion

In this paper we have tried to demonstrate some next steps towards a fully integrated account of argument and narrative. We have shown how stories can be used to present arguments from analogy, and how such arguments (and their critical questions) can be formally modelled using familiar techniques from CBR, especially legal CBR. Additionally we have explained how the

common computational structures of state transition diagrams and ontologies can be used to underpin our account.

Argument from analogy preys on the temptation to generalise from limited experience which seems ever present in people, often leading people to state fallacious generalisations. ("Whenever I take an umbrella it does not rain."). In its standard form the argument from analogy is very plain. But stories can give the analogy more substance and hence more persuasiveness. Also note that often it is not the truth of a story that is at issue, the power of an argument based on a story comes from the aptness and plausibility of the story not from whether it is taken to be finctional or not. For example Wittgenstein (1980) argued that "Christianity is not based on truth; rather, it offers us a narrative and says: now, believe!" A compelling argument does not necessarily have to be true, especially when it appeals to values (as parables often do)[13].

There remain a large number of open questions regarding the interactions between narrative and argument. For example, how exactly can we derive the point of a story from the story and the context in which it is told? How do different types of stories change or reinforce attitudes? Are stories just a rhetorical "trick" or can they be used to express information that otherwise remains implicit? Providing formal answers to these and other questions is pertinent if we want to fully integrate stories and arguments.

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[13] For Apollonius of Tyana, a 1st-century CE philosopher, the lack of any pretence to truth was a major strength of Aesop's fables: "Then, too, he was really more attached to truth than the poets are; for the latter do violence to their own stories in order to make them probable; but he by announcing a story which everyone knows not to be true, told the truth by the very fact that he did not claim to be relating real events."

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