

Presenting Arguments as Fictive Dialogue

Paul Piwek¹

Abstract. Presentation of an argument can take many different forms ranging from a monologue to advanced graphics and diagrams. This paper investigates the presentation of one or more arguments in the form of a fictive dialogue. This technique was already employed by Plato, who used fictive conversations between Socrates and his contemporaries to put his arguments forward. Ever since, there have been influential authors – including Desiderius Erasmus, Sir Thomas More and Mark Twain – that have used dialogue in this way. In this paper, we define the notion of a fictive dialogue, motivate it as a topic for investigation, and present a qualitative and quantitative study of five fictive dialogues by well-known authors. We conclude by indicating how our preliminary and ongoing investigations may inform the development of systems that automatically generate argumentative fictive dialogue.

1 INTRODUCTION

Whereas traditional deductive logic focuses on arguments as formal structures in which each step towards the conclusion builds on the preceding steps, naturally occurring argument often involves multiple perspectives, opinions and claims that are in competition with each other. For students of argumentation theory, the dialectical underpinning of argument has become a common place, partly as a result of the pioneering work by Hamblin [4]. Legal reasoning, with its arguments and counterarguments, provides a good example of a domain where traditional deductive methods are inadequate, because they do not capture the dialectical dimension (e.g., [10]). Also, researchers in *Natural Language Generation* (NLG) have proposed that rhetorical structures underlying argument in monologue form can be derived from the speaker's internal dialogue (e.g., [5]). Given the central role that dialogue plays in the understanding of argument, we believe that automated presentation of arguments as dialogue is a fruitful area of research.

Automated presentation of arguments as dialogue is an NLG task: given a representation of an argument (which could range from formulae in a logical calculus to natural language text), the aim is to automatically transform this representation to a dialogue presentation between two or more interlocutors. Apart from the dialectical underpinnings of argument, there are further reasons why dialogue is an attractive presentation medium. According to a number of empirical studies, for educational and persuasive purposes, presentation in dialogue form is more effective than monologue; for example:

- Craig et al. [2] found that dialogue stimulates students to write more in a free recall test and ask twice as many deep-level reasoning questions in a subsequent tutor-guided task on a different topic,

- Lee et al. [7] report that there is more discussion between students and less banter after watching a dialogue,
- Cox et al. [1] established that student learning is at least as good as with monologue, and
- Suzuki and Yamada [13], comparing dialogue between two lifelike characters – a persuader and a persuadee agent in an on-line shopping scenario – with monologue, found that dialogue is more effective as a means for persuasion; in particular, dialogue increased the purchase likelihood when compared to monologue.

Additionally, presenting information in the form of a dialogue is a popular means for engaging and entertaining an audience, as witnessed by the widespread use of dialogue in commercials, news bulletins (between presenters), educational entertainment, and games. From an application-driven point of view, dialogue is eminently suitable for multimodal presentations involving two or more lifelike computer-animated characters [11].

In the remainder of this paper, we first provide a more precise characterization of the notion of a fictive dialogue. We then look at five instances of professionally authored fictive dialogue. Finally, we try to extract some lessons from the information gleaned from these human-authored dialogues for the automatic generation of such dialogues.

2 FICTIVE DIALOGUE

The term *fictive dialogue* is ambiguous: it can refer to both an object or an event. We make the two senses explicit by distinguishing between fictive dialogue_o and fictive dialogue_e:

- A *fictive dialogue*_o is a script, i.e., the text of a dialogue that was written by one or more authors.
- A *fictive dialogue*_e is a performance by two or more actors who create the impression of being engaged a dialogue.

Often a fictive dialogue_e is performed by actors on the basis of script (a fictive dialogue_o), though actors may also improvise a fictive dialogue_e on the spot. A fictive dialogue_e does not involve real communication between the actors, rather the actors aim to create the impression in the audience that they are communicating and thus their verbal behaviour is intended primarily for the audience rather than each other. Similarly, fictive dialogue_o is not a record of real communication, but rather an artefact created by its authors.² Despite this absence of communication 'within' fictive dialogue, at another level it does, however, involve a communicative act. A fictive dialogue can be viewed as a communicative act that the originator (whether it be an author or actors in case of an improvised dialogue) directs at the

² Though intermediate cases exist: if an author edits the transcript of a real dialogue in order to incorporate it in, for example, a radio play, the resulting script occupies the space somewhere in between a fictive dialogue_o and a transcript.

¹ Centre for Research in Computing, The Open University, United Kingdom, Email: p.piwek@open.ac.uk

readers or audience. At this level a genuine communicative act does take place. Figure 1, shows diagrammatically how a fictive dialogue created by an author involves both real and feigned communication.

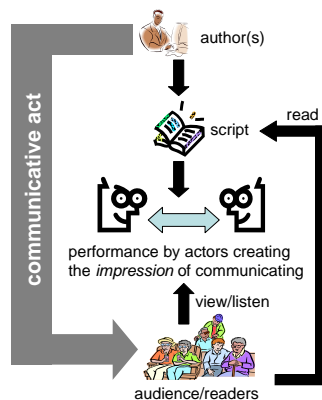


Figure 1. Real and feigned communication in fictive dialogue

As with monologue, the communicative acts that are performed through a fictive dialogue can be grouped into different types. A main distinction is that between *dramatic dialogue*, where the purpose is to tell a story, and *expository* or *information-delivering dialogue*, where the purpose is to convey information to the audience. Argumentative fictive dialogue has as its primary purpose the transfer of information, an argument. However, dramatic elements are often introduced to convey an argument more vividly. Consider, for example, the following argument:

(1) It is impossible to form any opinion spontaneously different from the one that one actually forms. It is formed automatically and instantly, without the person being able to control it. For suppose you try to change your opinion by reflecting upon it, you will find that it is not possible to change the opinion that way. The only way it can change is through outside influences.

The argument conveyed by this short text can be presented in the form of a fictive dialogue. This is exactly what Mark Twain does in his dialogue titled *What is Man?*, which we examine in Section 3. Below, Y.M. stands for Young Man and O.M. stands for Old man.

(2) Y.M. This is too much. You think I could have formed no opinion but that one?
 O.M. Spontaneously? No. And *you did not form that one*; your machinery did it for you—automatically and instantly, without reflection or the need of it.
 Y.M. Suppose I had reflected? How then?
 O.M. Suppose you try?
 Y.M. (*After a quarter of an hour.*) I have reflected.
 O.M. You mean you have tried to change your opinion—as an experiment?
 Y.M. Yes.
 O.M. With success?
 Y.M. No. It remains the same; it is impossible to change it.
 O.M. I am sorry, but you see, yourself, that your mind is merely a machine, nothing more. You have no command over it, it has no command over itself—it is worked *solely from the outside*. That is the law of its make; it is the law of all machines.

Note that Twain mixes some drama into the argument to liven it up: he carefully creates a climax by spreading the ‘experiment’, from its initiation to its conclusion, out over several turns – e.g., the outcome of the experiment takes four turns: ‘You mean you have tried [...]. Yes. With success? No.’. Bearing this in mind, the emphasis in this paper is on expository dialogue: argumentative fictive dialogue is primarily a means for information delivery; the purpose is to present the audience/readership with an argument. Whereas dramatic dialogue has been the subject of a number of academic studies (e.g., [6]) and popular guides on script writing (e.g., [3]), to our knowledge, no work has been undertaken on expository dialogue in general and argumentative fictive dialogue.³ In the next section, we make a beginning with addressing this gap by analysing five dialogues along a number of dimensions.

3 FIVE DIALOGUES

In order to make a beginning with examining the genre of argumentative fictive dialogue, we selected five dialogues that span the entire period from Plato’s original dialogues to the 20th century:

1. Plato (c. 387-380 B.C.) *Meno*.⁴
2. Desiderius Erasmus (1523; English translation of 1557). *A Merry Dialogue Declaring the Properties of Shrowde Shrews and Honest Wives*.⁵
3. Mark Twain (1906). *What is man?*⁶
4. David and Stephanie Lewis (1970). *Holes*.⁷
5. Raymond M. Smullyan (1977). *Is God a Taoist?*⁸

Our aim is to raise a number of qualitative questions that provide us with more insight into human-authored fictive dialogues:

- What is the nature of the argument: is it adversarial or cooperative?
- What are the roles played by the interlocutors?
- Do the dialogues have a dramatic as well as an expository element?

At the same time, we aim to collect quantitative information on the dialogues, and determine whether there are any meaningful relations between the qualitative and quantitative characterizations. Note that for the first two dialogues, the quantitative information only approximates that of the original dialogues, since we used translations. The quantitative measures that we looked into are:

- How many roles are there in each of the dialogues?
- How many turns does each interlocutor have?
- What is the distribution of the length of turns among the interlocutors?

Before we look at each of the dialogues separately, let us first present their profile regarding the total number of turns that each involves and the distribution of turns among interlocutors. As can be seen from Figure 2, the shortest dialogue in our set consists of just 87 turns, whereas the longest one takes no less than almost a tenfold of that: 817 turns.

³ Of course, for example, Plato’s dialogues have been studied by philosophers, but primarily to uncover Plato’s doctrines, rather than qualitative and quantitative linguistic properties of the dialogues he authored.

⁴ Source: <http://www.gutenberg.org/dirs/etext99/1meno10.txt>

⁵ Source: <http://www.gutenberg.org/files/14282/14282-h/14282-h.htm>

⁶ Source: <http://www.gutenberg.org/etext/70>

⁷ Source: *Australasian Journal of Philosophy* Vol. 48, No. 2; August, 1970

⁸ Source: *The Tao is Silent*, Harper & Row Publishers, Inc.

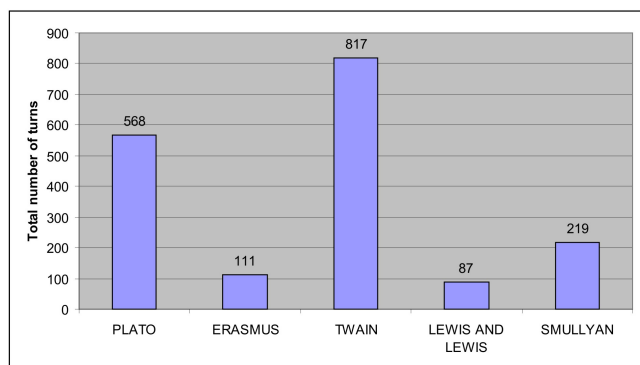


Figure 2. Number of turns in each of the five dialogues by Plato, Erasmus, Twain, Lewis and Lewis, and Smullyan

Generally, interlocutors split the number of turns equally among each other as a result of alternating turns: in Twain’s dialogue it is 407:411, Erasmus’s dialogue has 56:56, Lewis and Lewis’s dialogue has 43:45, and Smullyan’s dialogue has 108:112. The small differences arise because the dialogues are typically split into a number of parts. For each part, the interlocutors will either have exactly the same number of turns, *ABAB...AB*, or one interlocutors will have one more turn than the other, *ABAB...ABA*. The only apparent divergence from this pattern occurs in Plato’s dialogue, see Figure 3.

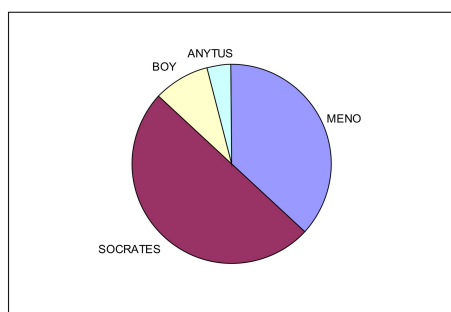


Figure 3. Distribution of turns in Plato’s *Meno* over the four interlocutors (Socrate, Meno, Boy and Anytus)

Plato’s *Meno* is different in that it has four interlocutors. The pattern is, however, still one of alternating turns. The person taking turns throughout the dialogue is Socrates. He has three interlocutors (Meno, Boy, and Anytus) – Plato has conversations with one at a time, hence in Figure 3 half of the turns are Plato’s.

3.1 Meno (Plato)

In this dialogue, the concept of virtue is examined. Its principal interlocutors are Socrates and Meno, a young man from one of Thessaly’s leading families. Meno is interested in the question whether virtue can be taught, is the result of practice, or neither. Socrates challenges Meno to first tell him what he thinks virtue is. Meno makes several attempts, but every time Socrates points out that his characterizations do not provide a proper definition of virtue. Socrates’s arguments draw on analogies – for example, he criticizes Meno for trying to define virtue by describing individual virtues. Socrates likens this to characterizing the nature of bees by listing several kinds of bee, and gets Meno to agree that it does not result in a satisfactory definition.

The discussion then moves on to how an inquiry, such as the current one, can lead to knowledge: Socrates puts forward the claim that any learning that takes place occurs through recollection of knowledge that the interlocutors already possessed. He then supports this

claim by having a conversation with Meno’s slave boy in which he purports to demonstrate that without teaching the boy, he can make him recollect some facts of elementary geometry: ‘Do you observe, Meno, that I am not teaching the boy anything, but only asking him questions; and now he fancies that he knows how long a line is necessary in order to produce a figure of eight square feet; does he not? Yes.’

Finally, the discussion returns to the question whether virtue can be taught, and Socrates proposes to proceed by hypothesis, in particular, the hypothesis that virtue is a kind of knowledge. Eventually, he concludes against this and proposes virtue may rather be a gift from the gods, the gift of right opinion: ‘But if not by knowledge, the only alternative which remains is that statesmen must have guided states by right opinion, which is in politics what divination is in religion; for diviners and also prophets say many things truly, but they know not what they say.’

We established that in all five dialogues considered here, the interlocutors take alternating turns. This does, however, not give us the full picture of how dominant each of the interlocutors is. For this purpose, information on the length of turns for each interlocutor is useful, where length as the number of words that a turn consists of. In Figure 4, we provide information on this for each interlocutor in Plato’s *Meno*. We have grouped turns of certain length together: 0–5, 6–10, 11–20, 21–30, 31–40, 41–50, 51–100, 101–200, 201–300, 301–400, 401–500, 501–600, 601–700. In order to fit all information in one bar chart, the groupings get larger (at 11, 51 and 101), starting with 0–5 and ending with 601–700. For each interlocutor, the chart depicts what percentage of an interlocutor’s turns fall into a certain grouping.

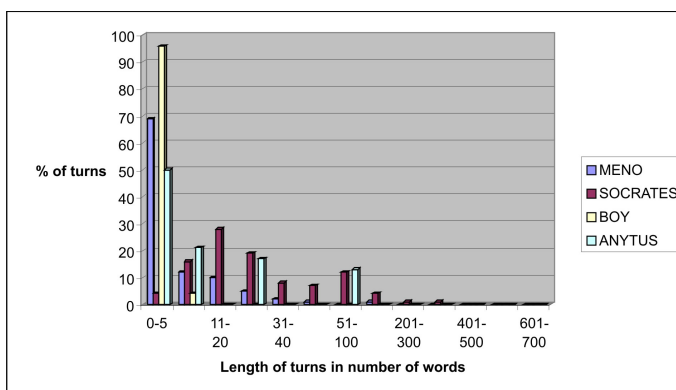


Figure 4. Percentage of turns grouped by length of turns for Plato’s *Meno* dialogue

From Figure 4 it is apparent that Socrates is the dominant speaker. The majority of turns for each of Anytus, Boy and Meno are in the 0–5 group. Socrates, in contrast, peaks at 11–20 and his turns spread out more equally among the groups, with a substantial proportion of his turns in the 51–100 group, and some even in the group of turns with between 301 and 400 words.

These data give a very different view of the dialogue than the one that Socrates wants us to accept. We already pointed out that Socrates tries to suggest that his role in the dialogue is one of helping the other interlocutor recollect knowledge. This is, however, not quite the story that our quantitative data tell us. If we zoom in on our data for the boy, this becomes even more apparent: 63% of the boy’s turns are of length 1, 21% of length 2, 6% of length 3, 6% of length 4, and, finally, 4% of length 6. Examining the boy’s turns even more closely, each falls into one of three categories: an affirmation of an assertion that

was formulated as a question (e.g., ‘And are there not these four divisions in the figure, each of which is equal to the figure of four feet? – True.’), an answer a WH-question (e.g., ‘But how much? – Four times as much.’), and the response ‘I do not understand’. Now, 73% of the boy’s turns are affirmations (‘I do’, ‘there are’, ‘It ought’, ‘that is evident’, ‘very good’, ‘certainly, Socrates’, etc.), 25% are answers to genuine WH-questions, and there is one instance of the response ‘I do not know’. These data call into question the rather strong claim that Socrates seeks confirmation for at the end of this interaction:

- (3) Socr: And that is the line which the learned call the diagonal. And if this is the proper name, then you, Meno’s slave, are prepared to affirm that the double space is the square of the diagonal?
 Boy: Certainly, Socrates.
 Socr: What do you say of him, Meno? Were not all these answers given out of his own head?
 Meno: Yes, they were all his own.

3.2 A Merry Dialogue (Erasmus)

This dialogue features Eulalia and Xantippa, the latter named after the wife of Socrates and prototype of shrews in literature. Eulalia provides Xantippa with advice on how deal with her unfavourably portrayed husband. As can be seen in Figure 5, Erasmus’s dialogue is different from Plato’s in that in Erasmus’s dialogue the interlocutors are more each others’ equals: the distribution of their turns over the various length matches up quite neatly, though Eulalia has a slight advantage when it comes to the extremely long turns (>100). Most of the points in this dialogue are made by the interlocutors sharing stories of wives. The dialogue contains very little direct argument (as introduced by WHY-questions such as ‘Why say ye so. I pray you, are you at odds now.’). Erasmus does, however, seem to use the dialogue as a whole to present and argue by example for his views on how a wife should behave.

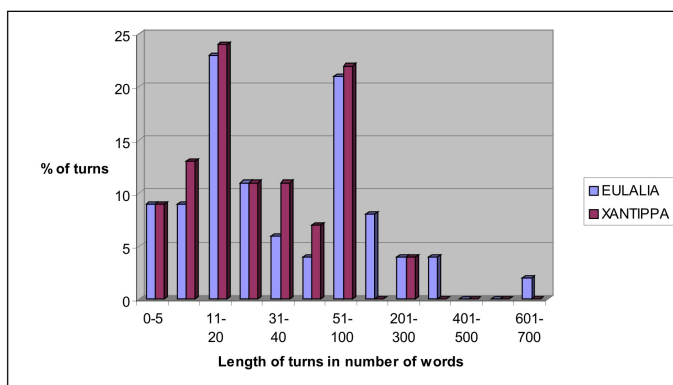


Figure 5. Percentage of turns grouped by length of turns for Erasmus’s dialogue

3.3 What is Man? (Twain)

Twain’s dialogue between an Old Man and a Young Man concerns the proposition proposed by the Old Man that man is merely a machine and nothing more. The Old Man plays a similar role to that of Socrates in Plato’s dialogues. He leads the dialogue, introducing thought experiments, arguments and rebuttals of the Young Man’s objections. The fact that the Old Man leads the dialogue is

reflected in the quantitative information regarding turn length in Figure 6: whereas about 40% of the Young Man’s turns are short ones (0–5), only about 20 % of the Old Man’s turns belong to this group. Whereas they are roughly equal for groups 6–10, 11–20 and 21–30, for all subsequent groups (from 41–50 to 601–700), the Old Man’s proportion of turns is larger than the Young Man’s.

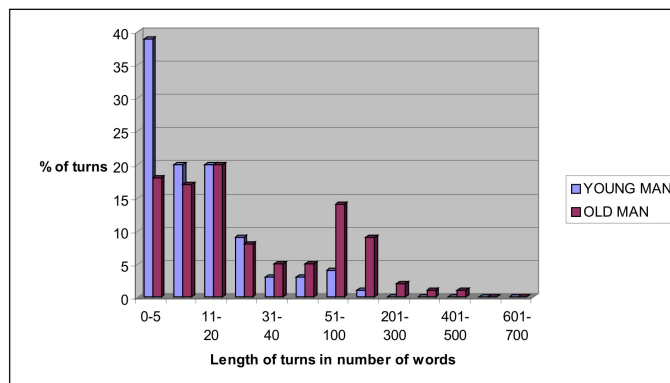


Figure 6. Percentage of turns grouped by length of turns for Twain’s *What is man?* dialogue

3.4 Holes (Lewis and Lewis)

This dialogue pits a materialist nominalist (Argle) against a realist (Bargle) regarding the existence of holes:

- (4) Argle: I believe in nothing but concrete material objects.
 Bargle: [...] Every time you get started on any such topic, I know we are in for a long argument. [...]
 [...]
 Bargle: A long evening’s work. Before we start, let me find you a snack. Will you have some crackers and cheese?
 Argle: Thank you. What splendid Gruyere.
 Bargle: You know, there are remarkably many holes in this piece.
 Argle: There are.
 Bargle: Got you!
 [...]

Argle seems somewhat at a disadvantage in Figure 7, with a higher proportion of short turns (0–5 and 11–20). However, Argle has an edge over Bargle when we compare very long turns (101–200 and 201–300). In this dialogue, it is Argle who puts forward certain claims – at first that ‘holes are fictions’ and later when made to retreat on that point that ‘the hole-lining is the hole’ – and Bargle questions these claims by presenting examples that appear to contradict Argle’s claims. In this respect, the dialogue resembles Plato’s *Meno*. The difference, however, is that Argle, as opposed to the character Meno, does get much more of a chance to put forward his position. Moreover, in this dialogue neither Argle nor Bargle gains a clear upperhand at the end. The purpose of the dialogue is made explicit when they conclude that ‘Argle: We agree in principle; we’re only haggling. Bargle: We do. And the same is true of our other debates over ontic parsimony. Indeed, this argument has served us as an illustration—novel, simple, and self-contained—of the nature of our customary disputes. Argle: And yet the illustration has interest in its own right. Your holes, had I been less successful, would have punctured my nominalistic materialism with the greatest of ease.’

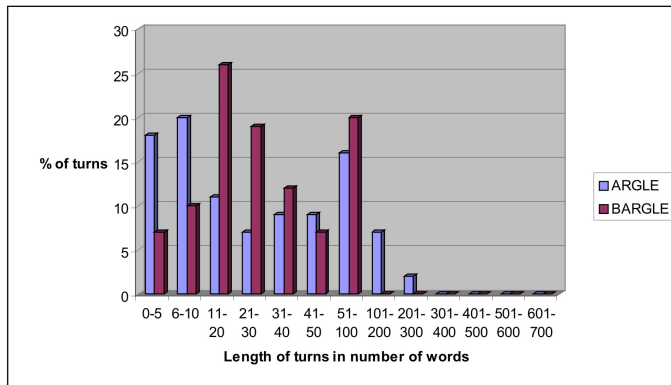


Figure 7. Percentage of turns grouped by length of turns for Lewis and Lewis's *Holes* dialogue

3.5 Is God a Taoist? (Smullyan)

God and a mortal discuss the problem of free will. The mortal asks God to be absolved of free will in order to avoid sinful behaviour, and God challenges the logic behind this request. The profile of this dialogue (Figure 8) resembles Plato's *Meno*, with God playing the Socratic role, having a lower proportion of short and higher proportion of long turns in comparison with the mortal.

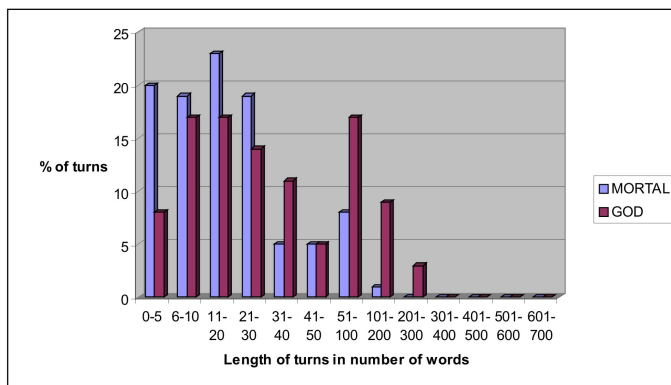


Figure 8. Percentage of turns grouped by length of turns for Smullyan's *Is God a Taoist?* dialogue

4 CONCLUDING REMARKS

The main purpose of this paper has been to draw attention to fictive dialogue as a natural means for presenting arguments. Automatic generation of such dialogue is a Natural Language Generation task, not unlike other presentation tasks in the area of computational models of natural argument [12]. We propose that a good starting point for this line of work is the close study of human-authored fictive dialogue. Our preliminary efforts were directed at both qualitative and quantitative properties of such dialogues. Most interesting from a qualitative perspective were, in our view, the fact that authors exploit dramatic elements in argumentative dialogue (Twain), and use dialogue not just as a vehicle for expressing arguments, but also as way to vividly present thought experiments/claims (Plato, Twain, Lewis and Lewis). We believe that further study of human-authored fictive dialogue can lead to a *typology of dialogue structures* that express arguments vividly, linking known argument structures in monologue to patterns in fictive dialogue. Such a typology could then be used to

inform automated mappings from argument in monologue to argument in dialogue form. Current work on mapping text in monologue form to dialogue (e.g., Piwek et al. [8]) is based on hand-crafted, rather than empirically motivated, mapping rules. In particular, the output dialogue structures are not based directly on patterns found in human-authored dialogues. Further exploration and analysis of the current corpus of dialogues could address this issue.

We saw that from a quantitative point of view, Plato's *Meno* is quite extreme: with one clear lead participant being privileged with the longer turns in the dialogue. There is much further work to be done, notably, we need to go beyond counting turns and length of turns and analyse the dialogues in more detail in terms of their dialogue acts, and repeat the current studies for further dialogues by the same authors. The latter could help us make more general claims about the *dialogue style* of these authors. This in turn could feed into work on automated dialogue generation. For example, the number of turns and length of turns for each interlocutor could be viewed as global constraints expressing the style of a particular author, and be used for automated generation of fictive dialogue – possibly in Piwek and Van Deemter's [9] constraint and revision-based dialogue generation architecture.

In conclusion, there are many open issues and questions to be answered, and yet we hope to have convinced the reader that presentation of arguments as fictive dialogues is a fruitful area for further research and that corpus-based approaches such as the current one provide a helpful starting point for such work.

REFERENCES

- [1] R. Cox, J. McKendree, R. Tobin, J. Lee, and T. Mayes, 'Vicarious learning from dialogue and discourse: A controlled comparison', *Instructional Science*, **27**, 431–458, (1999).
- [2] S. Craig, B. Gholson, M. Ventura, A. Graesser, and the Tutoring Research Group, 'Overhearing dialogues and monologues in virtual tutoring sessions: Effects on questioning and vicarious learning', *International Journal of Artificial Intelligence in Education*, **11**, 242–253, (2000).
- [3] R. Davis, *Writing Dialogue for Scripts*, A&C Black, London, 1998.
- [4] C.L. Hamblin, *Fallacies*, Methuen & Co Ltd., 1970. [reprinted by Vale Press, Newport News, Virginia, 1993].
- [5] R. Kibble, 'Generating coherence relations via internal argumentation', *Journal of Logic, Language and Information*, **16**(4), 387–402, (2007).
- [6] S. Kozloff, *Overhearing Film Dialogue*, University of California Press, Berkeley, 2000.
- [7] J. Lee, F. Dinneen, and J. McKendree, 'Supporting student discussions: it isn't just talk', *Education and Information Technologies*, **3**, 217–229, (1998).
- [8] P. Piwek, H. Hernault, H. Prendinger, and M. Ishizuka, 'T2D: Generating Dialogues between Virtual Agents Automatically from Text', in *Intelligent Virtual Agents*, LNAI 4722, pp. 161–174. Springer, (2007).
- [9] P. Piwek and K. van Deemter, 'Generating under Global Constraints: the Case of Scripted Dialogue', *Journal of Research on Language and Computation*, **5**(2), 237–263, (2007).
- [10] H. Prakken and G. Sartor, 'Modelling reasoning with precedents in a formal dialogue game', *Artificial Intelligence and Law*, **6**(2–4), 231–287, (1998).
- [11] H. Prendinger and M. Ishizuka, *Life-Like Characters: Tools, Affective Functions, and Applications*, Cognitive Technologies Series, Springer, Berlin, 2004.
- [12] C. Reed and F. Grasso, 'Computational Models of Natural Argument', in *ICCS 2002*, volume 2073 of *LNCS*, pp. 999–1008, Berlin, (2001). Springer.
- [13] S. V. Suzuki and S. Yamada, 'Persuasion through overheard communication by life-like agents', in *Procs of the 2004 IEEE/WIC/ACM International Conference on Intelligent Agent Technology*, pp. 225–231, Beijing, China, (September 2004).