ISSA Proceedings 2014 – Suppositions In Argumentative Discussions: A Pragma-Dialectical Solution For Two Puzzles Concerning Thought Experimentation

Abstract: The practice of constructing imaginary scenarios for the sake of argument is sometimes referred to as 'thought experimentation.' In this paper, I employ analytical tools from the pragma-dialectical theory of argumentation in order to clarify two theoretical puzzles that have been formulated with respect to thought experimentation. I do so by analysing the place and function of argumentative moves that contain suppositions in their propositional content. Three such moves are distinguished: proposing suppositions, accepting suppositions and using suppositions.

Keywords: thought experimentation, argumentation, suppositions, pragma-dialectics, speech acts

1. *Introduction*

Thought experimentation is a pattern of argumentative discourse in which the speaker constructs an imaginary scenario with the aim of showing that a previously expressed opinion is unacceptable. The pattern is usually encountered in scholarly communication and unfolds along the following lines. The author begins by calling into question a theory (principle, claim etc.) that some fellow scholar accepts. Next, the author proposes that some imaginary scenario is supposed for the sake of argument. This imaginary scenario will typically contain borderline impossible events and objects. Some well-known thought experiments speak of superhuman abilities, incredibly precise mechanisms, fantastic worlds, highly improbable coincidences etc. The borderline impossibility of the described events, however, does not seem to affect the author's argumentation. Because of what would happen in the imagined scenario, we are told, the academic theory

under discussion is deemed unacceptable.

The following thought experiment has been put forward by Jackson (1986) and it is known as “Mary’s Room” (sometimes also “The Knowledge Argument”). The targeted position in this case is *physicalism*, a philosophical conception according to which everything is (ultimately) physical. For a physicalist, all knowledge of the world is, generally speaking, knowledge of physical particles in motion. In response to this, Jackson invites us to consider the following scenario:

Mary is a brilliant scientist who is, for whatever reason, forced to investigate the world from a black and white room via a black and white television monitor. She specializes in the neurophysiology of vision and acquires, let us suppose, all the physical information there is to obtain about what goes on when we see ripe tomatoes, or the sky, and use terms like ‘red’, ‘blue’, and so on. She discovers, for example, just which wavelength combinations from the sky stimulate the retina, and exactly how this produces via the central nervous system the contraction of the vocal chords and expulsion of air from the lungs that results in the uttering of the sentence ‘The sky is blue’. What will happen when Mary is released from her black and white room or is given a colour television monitor? Will she learn anything or not? It seems just obvious that she will learn something about the world and our visual experience of it. But then is it inescapable that her previous knowledge was incomplete. But she had all the physical information. Ergo there is more to have than that, and Physicalism is false. (p. 130)

Until the early 1990s, thought experiments were discussed only in passing, and more as a curious case than as proper forms of academic discourse (see for example Fodor, 1964; Kuhn, 1977; Mach, 1976; Popper, 1992; Sheldon, 1973). Subsequently, several monographs, collections of essays and papers brought the topic back to life, prompting quite intense debates over how thought experimentation works and how it should work (Brown, 1991; Dennett, 2013; Frappier, Meynell, & Brown, 2013; Gendler, 2000; Häggqvist, 1996; Horowitz & Massey, 1991; Wilkes, 1988). The practice turned out to be the source of some enduring puzzles about science and argumentation. I want to focus on two such puzzles. I think these particular two are variations on what is essentially the same theme and I will later claim that both can be resolved (or dissolved) by employing tools developed in the pragma-dialectical theory of argumentation (van Eemeren & Grootendorst, 1984; 2004; van Eemeren, 2010).

2. *Two puzzles concerning thought*

The first puzzle has arisen when trying to answer a seemingly simple question: Are thought experiments arguments? To some scholars, the answer is clearly yes; to others, it is clearly no. The practice of thought experimentation seems to have an argumentative dimension, but seems, at the same time, to be intriguingly different from the typical, deductive or inductive schemes in which argumentation is usually cast. According to Norton (1991; 1996; 2004), thought experiments "are merely picturesque arguments" (2004, p. 1139) and "to conduct a thought experiment is to execute an argument" (1996, p. 356). According to the other camp, equating thought experiments with arguments – or reconstructing them as such – misses a more general (perhaps 'the') point about this practice. For example, Brown (1986; 1991) argues that at least in some cases, reconstructing thought experiments as arguments would obscure the way in which we "grasp" the scientific laws and concepts. In a similar vein, Gendler (2000; 2004) argues that reconstructing thought experiments as arguments is misleading because thought experiments do not reach their conclusion inferentially but "quasi-observationally" (2004, p. 1154). The variety of positions that have been taken with respect to this puzzle is not captured, of course, by this brisk overview (De Mey, 2003; Häggqvist, 1996; Moue, Masavetas, & Karayianni, 2006). However, the crux of the matter should be evident: thought experiments seem to have an obvious argumentative dimension, they work fully or partially in much the same way arguments do, but pinpointing this dimension brings one into conceptual problems. Are they 'just' arguments? Are they 'more than that'?

The second puzzle has its origin in the papers of Fisher (1989) and Bowels (1993) on the so-called "suppositional argument." The suppositional argument presents the logician with a problem because its premises are made up of suppositions, and suppositions are quite clearly not in the same class with assertions (Fisher, 1989, p. 402). Supposing for the sake of argument that there is a brilliant scientist locked up in a room is indeed an altogether different speech act than asserting the same content. If the notion of argumentation is defined as a sequence of *assertives* put forward in support of a conclusion, the 'suppositional argument' appears to be a contradiction in terms. Fisher's proposed solution is to redefine our conception of argument altogether so as to include this deviant case. Theories that model argumentation merely as a sequence of assertives should then recognize the suppositional argument as "a serious omission" (1989, p. 401).**[i]** While Fisher and Bowels do not use the term 'thought experiment,' it is evident

from the examples they discuss (Galileo's Falling Bodies thought experiment *inter alia*) that the raised issues pertain to the practice of thought experimentation. The question becomes: is thought experimentation an altogether different class of argumentative behaviour? If so, what kind of theory would cover both thought experiments and the more 'normal' arguments made up of assertives?

While these two puzzles and their corresponding debates belong to different disciplinary contexts, it should be clear that they are not worlds apart. The general claim of this paper is that the puzzlement in each case has its origin in a persistent ambiguity concerning the relationship between the imaginary scenario and the targeted academic claim. Resolving this ambiguity should resolve the puzzlement.

3. *Argumentative moves with suppositions*

The analytical distinctions that will be introduced in what follows are based on the pragma-dialectical model of a critical discussion (van Eemeren & Grootendorst, 1984; van Eemeren & Grootendorst, 2004; van Eemeren, 2010). In this model, a speech act counts as an argumentative move if it contributes to the process of resolving of a difference of opinion. Two speakers are said to have a difference of opinion when they externalize different standpoints with respect to the same propositional content. For example, one speaker might put forward a positive standpoint (e.g. 'I think jazz is more difficult to lear than blues'), while the other speaker puts forward either doubt (e.g. 'I'm not so sure about that') or the opposite standpoint (e.g. I think it's the other way around: Blues is way more difficult!'). In pragma-dialectics, a critical discussion is divided into four stages: the confrontation stage in which the difference of opinion is externalized, the opening stage in which the parties try to find a common ground, the argumentation stage in which the standpoint is tested against critical reactions and the concluding stage in which the speaker's commitments are reaffirmed or withdrawn. In each of these stages, the discussants will perform specific argumentative moves such as putting forward standpoints, asking critical questions, putting forward argumentation, and requesting definitions. As an ideal model, the critical discussion is meant to offer a systematic basis for the analysis and evaluation of real-life argumentative discourse. In this paper, I will employ the model exclusively for analytical purposes.

Examined through the model of a critical discussion, a thought experiment will appear as a sequence of argumentative moves performed by an antagonist in an

attempt to resolve a difference of opinion concerning the 'targeted' academic claim. For example, Jackson's thought experiment would be reconstructed as a contribution to a discussion on the physicalist claim that all knowledge of the world is, roughly, knowledge of physical particles in motion. The author takes a negative standpoint with respect to this claim, while physicalists presumably maintain their positive standpoint (confrontation stage). The imaginary scenario of Mary the brilliant scientist is then introduced as a common ground for discussing the acceptability of physicalism (opening stage). Jackson then argues, based on what is said to happen in the scenario, that physicalism is unacceptable (argumentation stage). Finally, in a section of the paper that has not been reproduced here, Jackson proposes that the doctrine of physicalism is too rudimentary to cover the many sources of human knowledge, so it should be either significantly modified or altogether retracted (concluding stage). What this short reconstruction shows is that this thought experiment can be reconstructed as a contribution to a process of resolving a difference of opinion. The next step in resolving the above-mentioned puzzles is reconstructing the role of suppositions in such a resolution process. This will amount to specifying
(1) the kind of argumentative moves that are performed based on suppositions,
(2) the stage(s) in which these argumentative moves are performed, and
(3) the contribution of these argumentative moves to the process of resolving the difference of opinion. I propose to distinguish three such argumentative moves.

The first argumentative move that can take one or more suppositions as part of its propositional content is the *proposal of suppositions*. This move is typically performed explicitly and is signalled textually by let's-constructions such as 'let's suppose,' 'let's say,' and 'let's imagine'. Being directive (more precisely: an invitation), the proposal of suppositions will belongs to the opening stage of a resolution process. Its illocutionary point is to have the hearer join the speaker in temporarily discussing as if some propositions, the ones making up the imaginary scenario, are true. For ease of reference, I will represent the set of all introduced suppositions with the variable 'SCENARIO', and the protagonist and antagonist as LU1 and LU2, respectively. The proposal of a supposition can thus be given as the following argumentative move performed by the antagonist (LU2) in the opening stage:

LU2: !/(LU1 & LU2 discuss as if SCENARIO)

The details of how the parties will 'discuss-as-if' will vary from context to context

and need not concern us for the present purposes. Generally, the antagonist (LU2¬) will invite the protagonist (LU1) to temporarily refrain from questioning the truth of the propositions under the set SCENARIO. LU2 is thus trying to establish a discussion rule, a 'formal starting point' that will regulate the discussants' future contributions.**[ii]**

In order for such a formal starting point to be applicable, however, the protagonist (LU1) must also *accept* the antagonist's proposal. The *acceptance of suppositions* is the second argumentative move that must be distinguished. By accepting the proposal, the protagonist is effectively consenting to the discussion rule of discussing as if SCENARIO is true. This can be reconstructed as the performance of a commissive in the opening stage of the resolution process. Following the same formula, the commissive can be represented as follows:

LU1: +/(LU1 & LU2 discuss as if SCENARIO)

It is important to note that neither of the two moves discussed so far needs to be performed explicitly in order for other argumentative moves to follow. Generally, since thought experiments are put forward in monological texts, the antagonist will propose the suppositions and then simply continue his contribution. This is exemplified in Jackson's thought experiment, where the readers' (inevitable) silence is provisionally taken to count as acceptance. A proposal-acceptance sequence performed with respect to a set of suppositions forming a SCENARIO can be referred to as the *introducing* of those suppositions in the discussion.

Introducing suppositions in a discussion can be pragmatically justified only if the proposer means to subsequently use these suppositions in the discussion. Abandoning the 'discussing-as-if' venture after the proposal was accepted would be equivalent to inviting someone to dinner and not showing up – at best, this would suggests a speaker's misuse of the let's-construction (Clark, 1993). It is important then to distinguish a third argumentative move, a move that will be called *using suppositions.* This move is an assertive speech act that contributes to the resolution process because it provides support for the antagonist's standpoint. The move will thus be reconstructed as part of the argumentative stage of the resolution process. In this terminology, to use a scenario in an argumentative discussion means to put forward an argument that contains those suppositions as antecedents.

It follows from the previous analysis that suppositions must appear both in the simple premises of an argument *and* in the bridging premise.**[iii]** This should square well with the intuitive idea that scenario 'works against' the academic claim both because of what the other party says it would happen *and* because of what would 'really' happen. Let us denote the protagonist's standpoint as 'T' and the consequences derived from the scenario as 'c'. The simple and the bridging premises in which suppositions are used can be represented respectively as follows:

LU2: +/(If SCENARIO, then ¬c)
LU2: +/(If T, then if SCENARIO, then c)

Putting forward these two speech acts is not like, say, asking a question and then later asking another question. Rather, the two *taken together* form a complex speech act of argumentation – they are premises of the same argument. In pragma-dialectics, the relation between premises is represented in argumentation structures, which in this case would take the following form:

1. ¬ *T*
1.1 If SCENARIO, then ¬*c*
1.1' If T, then if SCENARIO, then *c*

The double conditional in the bridging premise (1.1') is usually avoided in natural language, partly because of the strange if-then-if-then construction, and partly because it is often obvious that the arguer is labouring under the introduced suppositions. Jackson's thought experiment is a good example. While no if-then-if-then construction appears explicitly, the bridging premise can be reconstructed from the following sequence of assertives: "It seems just obvious that she will learn something about the world and our visual experience of it. But then is it inescapable that her previous knowledge was incomplete. But she had *all* the physical information. *Ergo* there is more to have than that, and Physicalism is false." Taken together, these assertives can be reconstructed in the following structure:

1. ¬ (PHYSICALISM is true)
1.1 If MARY-IN-THE-ROOM SCENARIO, then Mary does learn something new
1.1.1 Mary learns about coloured objects
1.1' If PHYSICALISM, then if MARY-IN-THE-ROOM SCENARIO, then she doesn't

learn anything new

During real-life instances thought experimentation, the simple premise (1.1) is typically questioned implicitly or explicitly by the protagonist, which prompts further argumentation from the antagonist. A more detailed analysis is required for establishing how these more complex structures can best be represented. For the present purposes, it need only be stressed that suppositions can be part of the argumentation stage of an argumentative discussion without necessarily being in the same class of speech acts as assertives. The suppositions (represented by the variable SCENARIO) are part of the antagonist's argumentation, yet only as antecedents, not as premises.

Distinguishing between the proposal, acceptance and use of suppositions as three separate argumentative moves that can be performed in an argumentative discussion is crucial for understanding the argumentative dimension of thought experimentation. Though the distinctions above have been introduced at a rather swift pace, they should be sufficient to throw some light on the two puzzles discussed above.

4. *The two puzzles revisited*

The distinctions introduced in the previous section are not meant to exhaust the topic of suppositions and their functions in argumentative discourse. They do provide a basis for approaching the two puzzles described in section 2. As explained, both puzzles concerned the relationship between thought experimentation and argumentative moves. Before going back to each of the two puzzles and see what insights can be drawn, it might be useful to first delineate the principal points of the solution here proposed.

What the analysis above has indicated is that putting forward a thought experiment commits two speakers to a variety of argumentative moves. The expression 'to put forward a thought experiment' covers in its present usage a more complex form of linguistic behavior than, say, 'to put forward a question' or even 'to put forward an argument'. To engage in thought experimentation means to take part in a structured dialogical process whose aim is (*inter alia*) the resolution of a difference of opinion. Due to various institutional conventions that constrain this process, we can only 'see' the antagonist's moves, the protagonist's moves being quoted, reported or left implicit. The monological performance, however, does not change the argumentative dimension of the antagonist's

behavior. The antagonist is in the position of someone displaying his tangoing skills with an invisible partner: his moves are still *meant* as tango moves even though, as we know, the real process takes two. If the pragma-dialectical model is used to analyze this process, it will be trivial to observe that a thought experiment is not an argument and that supposing is not asserting. With the introduced distinctions, one can also pinpoint more precisely why this should be so.

The first puzzle was brought forth by scholars who disagreed upon the general relationship between thought experimentation and argumentation. In this debate, thought experiments are either arguments, in which case they can be reconstructed as such, or not, in which case the reconstruction must fail on some account. Whatever epistemological assumptions might fuel this dilemma, it does not seem to have a pragmatic basis.**[iv]** The analysis developed here has shown that the texts quoted as instances of thought experimentation are evidently *more than arguments* since two of the argumentative moves identified (the proposal and the acceptance of suppositions) are not assertives. At the same time, the speech acts put forward by the antagonist in the argumentation stage of the discussion are evidently *nothing but arguments* since the illocutionary point of using suppositions is to support the standpoint. Thought experimentation is thus a complex argumentative phenomenon consisting of many argumentative moves performed at different stages of a discussion, all of which realize the point of convincing the other party of the unacceptability of T.

The second puzzle was brought forth by scholars who disagreed upon the relationship between suppositions and argumentation. In the analysis above, suppositions where shown to have a function in various stages of an argumentative discussion. This versatility can be explained technically by pointing out that suppositions are not illocutionary acts. Rather, suppositions are contained in the predication act of various types of illocutionary acts such as directives (when they are proposed), commissives (when they are accepted) and assertives (when they are used). The supposition ‘Mary is a brilliant scientist who investigates the world from a black-and-white room’ is only part of the propositional content of an illocutionary act such as ‘(Let’s) Suppose Mary is a brilliant scientist who investigates the world from a black-and-white room’. Because of this, the label ‘suppositional argument’ designates, not an altogether different form of argumentative behavior, but a rather common argumentation structure in which both the simple and the bridging premises are conditional

statements taking suppositions as antecedents.

5. *Conclusion*

Thought experimentation has been analyzed here as a contribution to a process of resolving a difference of opinion. While the reader who is accustomed to the rigid language of scientific communication will perhaps see them as rarities, there is pragmatically speaking nothing strange about engaging in thought experimentation. The antagonist proposes some formal starting points (discussion rules), the protagonist accepts, after which the two make use of the introduced starting points in order to test the acceptability of the standpoint under discussion. While a thought experiment might appear as a monologue, through pragma-dialectical analysis these dialogical processes can be reconstructed. The result of such a reconstruction is that the relationship between the imaginary scenario and the targeted claim becomes clear and the various functions of speech acts containing suppositions can be characterized as argumentative moves in a resolution process.

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i. For an overview of theories that take argumentation to be exclusively a matter of putting forward assertions see Bowels (1993, p. 237).

ii. For the notion of 'formal starting point' see van Eemeren & Grootendorst (1984, p. 84).

iii. The distinction between simple and bridging premises is discussed, in a slightly different terminology, by van Eemeren and Grootendorst (1984, chapter 6).

iv. One of the first formulations of this dilemma appears in Norton (1991): "Thus there is only one non-controversial source from which this information can come: it is elicited from information we already have by an identifiable argument, although that argument might not be laid out in detail in the statement of the thought experiment. The alternative to this view is to suppose that thought experiments provide some new and even mysterious route to knowledge of the physical world" (p. 129, my italics).

References

Bowels, G. (1993). Professor Fisher on suppositions. *Argumentation*, 7, 237-246.

Brown, J. R. (1986). Thought experiments since the scientific revolution. *International Studies in the Philosophy of Science,* 1(1), 1-15.

Brown, J. R. (1991). *The laboratory of the mind: Thought experiments in the*

natural sciences. London/New York: Routledge.
Clark, B. (1993). Let and let's: Procedural encoding and explicature. *Lingua*, 90(1), 173-200.
De Mey, T. (2003). The dual nature view of thought experiments. *Philosophica*, 72(2), 61-78.
Dennett, D. (2013). *Thought experiments and other tools for thinking*. London: W. W. Norton & Company.
Eemeren, F. H. van (2010). *Strategic maneuvering in argumentative discourse: Extending the pragma-dialectical theory of argumentation.* Amsterdam/Philadelphia: John Benjamins.
Eemeren, F. H. van, & Grootendorst, R. (1984). *Speech acts in argumentative discussions: A theoretical model for the analysis of discussions directed towards solving conflicts of opinion.* Dordrecht: Foris Publications.
Eemeren, F. H. van, & Grootendorst, R. (2004). *A systematic theory of argumentation: The pragma-dialectical approach.* Cambridge: Cambridge University Press.
Fisher, A. (1989). Suppositions in argumentation. *Argumentation*, 3(4), 401-413. doi: 10.1007/BF00182607
Fodor, J. A. (1964). On knowing what we would say. *The Philosophical Review*, 73(2), 198-212.
Frappier, M., Meynell, L., & Brown, J. R. (Eds.). (2013). *Thought experiments in philosophy, science and the arts.* New York/London: Routledge.
Gendler, T. S. (2000). *Thought experiment: On the powers and limits of imaginary cases.* New York: Garland Publications.
Gendler, T. S. (2004). Thought experiments rethought – and reperceived. *Philosophy of Science,* 71(5), 1152-1163.
Häggqvist, S. (1996). *Thought experiments in philosophy.* Stockholm: Almqvist & Wiksell.
Horowitz, T., & Massey, G. (Eds.). (1991). *Thought experiments in science and philosophy.* Lanham, MD: Rowman & Littlefield.
Jackson, F. (1986). What Mary didn't know. *The Journal of Philosophy,* 83(5), 291-295.
Kuhn, T. S. (1977). *A function for thought experiments. The essential tension: Selected studies in scientific tradition* (pp. 240-265). Chicago: University of Chicago Press.
Mach, E. (1976). On thought experiments. In B. McGuinness (Ed.), *Knowledge and error: Sketches on the psychology of enquiry* (T. J. McCormack, P Foulkes

Trans.). (pp. 134-147). Reidel: Dordrecht.
Moue, A. S., Masavetas, K. A., & Karayianni, H. (2006). Tracing the development of thought experiments in the philosophy of natural sciences. *Journal for General Philosophy of Science*, 37(1), 61-75.
Norton, J. D. (1991). Thought experiments in Einstein's work. In T. Horowitz, & G. Massey (Eds.), *Thought experiments in science and philosophy* (pp. 129-144). Lanham: Rowman & Littlefield.
Norton, J. D. (1996). Are thought experiments just what you thought? *Canadian Journal of Philosophy*, 26(3), 333-366.
Norton, J. D. (2004). On thought experiments: Is there more to the argument? *Philosophy of Science*, 71(5), 1139-1151.
Popper, K. R. (1992). On the use and misuse of thought experiments, especially in Quantum Theory. *The logic of scientific discovery* (pp. 464-480). London: Routledge.
Sheldon, K. (1973). The use and misuse of critical gedankenexperimenten. *Journal for General Philosophy of Science,* 4(2), 323-334.
Wilkes, K. V. (1988). *Real people: Personal identity without thought experiments*. Oxford/New York: Clarendon Press.