## Informal Logic

# Introduction to the Special Issue. Douglas Walton and his Contribution to Argumentation Theory

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# Douglas Walton and his Contribution
# to Argumentation Theory

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## 1. Introduction

Douglas Walton's work is extremely vast, multifaceted, and inter-disciplinary. He developed theoretical proposals that have been used in disciplines that are not traditionally related to philosophy, such as law, education, discourse analysis, artificial intelligence, or medical communication. Through his papers and books, Walton redefined the boundaries not only of argumentation theory, but also logic and philosophy. He was a philosopher in the sense that his interest was developing theoretical models that can help explain reality, and more importantly interact with it. For this reason, he proposed methods that have been used for analyzing different types of dialogical interactions, and modeling procedures for regulating them.

Presenting Douglas Walton would be an endless task. Describing the paths that he opened and the research that he inspired would always result in an incomplete and inadequate account. However, illustrating how his research changed the way we look at arguments and affected different disciplines can perhaps provide an idea of his revolutionary work. This special issue intends to give some examples of how he inspired research in different disciplines, showing some of the many trails he blazed.

## 2. The pragmatics of argument

One of the tenets of Walton's theory of argument is its pragmatic dimension. Arguments are regarded as instruments for resolving a difference that exists between two or more parties (Walton 1990, p. 411), whose nature depends on the type of dialogue such parties are engaging in. This view of argument makes Walton's theory essentially pragmatic, as it addresses the how the use of language and its relationship with the context affects meaning (Huang 2014, p. 2; Jaszczolt 2018, p. 134; Kecskes 2013, p. 21). For Walton, an argument cannot be studied in isolation from its dialogical context, the goals that the interlocutors jointly pursue, and their common ground. Arguments can be reconstructed, analyzed, and evaluated only by considering the reason why they have been put forward, the type of dialogical activity in which they occur, their function in the communicative exchange, and their relationship with the parties' commitments (Walton 1989, p. 2). In this perspective, the semantics of arguments—relation on a set of propositions—as inextricably linked with its pragmatic dimension, i.e., its uses. Only after analyzing how an argument has been used, in what context, by whom, and based on what presumptions (in short, "what an argument may reasonably be taken to be"), it is possible to reconstruct its semantics.

For Walton, the analysis of the relation between an argument and its context occurs at three levels (Walton 1999). First, an argument is always used in a dialogical activity, which can be classified in macro-categories called the types of dialogue. Persuasion, inquiry, negotiation, deliberation, discovery, information seeking, and eristic dialogues (Walton 1989, 1995, ch. 4; 2010) represent different joint purposes that the interlocutors can pursue when they use arguments. An argument is primarily aimed at steering the interlocutor's commitment towards a conclusion; however, this goal can be intended for different dialogical purposes, such as persuading the interlocutor, proving a claim, securing a commitment, etc. (Walton 1996, ch. 1). The suitability of the use of an argument to pursue the interactional goal determines its relevance, and thus its reasonableness (Walton 2004, ch. 4).

The second contextual aspect of an argument lies in its relationship with the sequence of moves of which it is part. A move (an

argumentative move, in this case) is not isolated from its context, but it is constrained by the preceding exchanges and constrains the following, resulting in a "profile of dialogue" (Walton 1989). The preceding sequence limits the range of the possible moves—or the type of move—that can be performed: for example, a question is normally followed by a reply, or a refusal to reply, but not by a proposal or an unrelated statement. A typical profile of dialogue is the following (Walton 2015, p. 97):
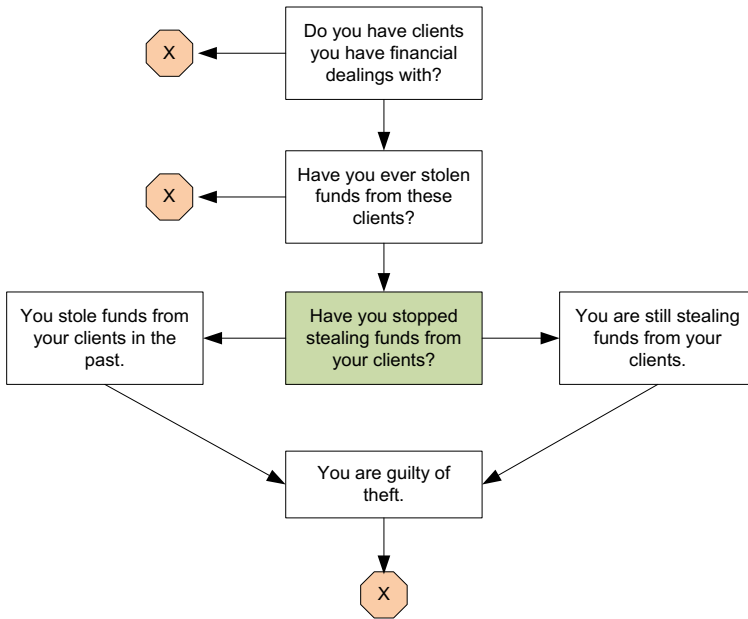


*Figure 1: Profile of dialogue*

These representations of the co-text of a move can predict—and assess—the possible continuations of the dialogue, and more importantly, disambiguate the structure of an argument by deter-mining its function and the presumptions used for reaching the conclusion (Walton 1999). For example, an argument from igno-rance has different probative weights in different "profiles of dialogue:" the failure to deny a claim that X is a stronger or weak-er reason to draw the conclusion that the speaker is committed to X depending on whether s/he was asked directly, interrogated, or s/he simply replied to an insinuation or contributed to a discussion.

The relevance of an argument (or a move) to its context, both considered at a macro level (the dialogical activity) and the local one (the sequence of turns), is the requirement for reconstructing its structure and the fundamental criterion for determining its reasonableness (Walton 1982, 2004). However, to be reasonably used, an argument needs to comply with a contextual dimension that is often hidden, i.e., the common ground, or rather the interlocutors' commitments. The use of an argument depends on the premises that the interlocutor accepts: a semantically valid argument can be used unreasonably or unpersuasively in a context in which the hearer does not accept or share a premise (Walton 1998, p. 9). The coherence of an argument with the interlocutor's explicit and unexpressed (dark-side) commitments (Walton 1987, p. 144; 1995) encompasses the other two contextual levels of relevance. Commitments result from the agreement on the type of dialogical activity pursued and from the previous moves, which also establish procedural commitments such as the burden of proof. However, a party's set of commitments includes also the dialogical obligations resulting from previous dialogues, and the inferences that can be drawn from the existing or past commitments.

Walton's pragmatic approach to arguments is not only revolutionary for logic and argumentation, but also for the field of pragmatics. He does not only show the contextual side of arguments, but also unveil the argumentative nature of context. For Walton, the problem of reconstructing the "common ground" and thus the implicit commitments drawn from the context of an argument is solved at a purely dialectical level. Instead of resorting to an explanation at a cognitive level–describing the common ground as what is mutually or commonly belied or known (Clark and Brennan 1991, 222; Kecskes and Zhang 2009; see the distinc approach in Stalnaker 1984)—dark-side commitments are analyzed in terms of presumptions and evidence. An implicit commitment becomes relevant when it becomes a "point of order" (Hamblin 1970, p. 284), namely when it clashes with another commitment and it is necessary to solve the procedural problem. The reconstruction of a dark-side commitment is regarded as an argumentative process in which evidence and presumptions are provided and compared until a conclusion can be reached.

Walton's pragmatic view of arguments has changed the way we look at fallacies. Instead of considering them as incorrect or invalid arguments, thus problems of the form or structure of an argument, they became acknowledged as a matter of context. The fallaciousness of an argument depends on how it is used within a specific context (Walton 1995). However, this treatment of sophisms is only one of the possible implications of Walton's theory, which is otherwise very little explored in argumentation theory and practically neglected in the field of pragmatics. In contrast, this pragmatic perspective had noticeable impact on other disciplines, in particular education and artificial intelligence.

## 3. The dialectical semantics of arguments

Walton underscored how arguments have not only a semantic, but also a pragmatic dimension. Above we outlined how he introduced this distinction and advanced a theory for studying how arguments are used. The analysis of the semantic aspect is mostly represented by the argumentation schemes theory, which proposed a new way of looking at argument structure by redefining the boundaries of logic and bringing it back to its origins.

The semantics of arguments is the core of logic. More precisely, it is the core of dialectics, a discipline that constituted the background of the ancient and medieval academic training, and which was reduced in the last few centuries to formal operations within a limited semantic system. The study of the types of argument was the focus of Aristotle's works on *Topics*, *Rhetoric*, and *Sophistical Refutations*, in which he described the different "topics," or inference links, that guarantee the plausibility of the passage from one or more premises to a controversial claim (Kienpointner 1987). The topics had a twofold nature (De Pater 1965): they were instrument for reconstructing the natural arguments, allowing a conclusion to follow from a premise through a conditional; but they were also instruments for inventing new arguments. The topics were tools for retrieving the premise needed for supporting an intended conclusion from the *endoxa*, i.e., the propositions that are generally known, shared, or accepted (Abaelardus *Dialectica*, p. 262). The topics were abstract condi-

tionals (such as, "if the *definiendum* is predicated of *x*, then also the definition is predicated of *x*). However, these generally accepted premises needed to be specified considering what the audience is disposed to accept (in this case, the specific definitions, such as of "life," "crime," etc.). The Aristotelian account connected the structure of arguments with the contexts in which they are used: topics were rules of inference (Hitchcock 2017, p. 71) instantiated considering what is presumed to be accepted by the audience (Walton 1996, p. 4)

The object of Walton's semantics of argument is the "pragmatic" inference (Geis and Zwicky 1971; Harris and Monaco 1978; Johnson et al. 1973), namely the logical passage from premises to conclusion "drawn out by a hearer on the basis of what a speaker's remarks suggest, as opposed to logical inferences that necessarily follow from what a speaker asserts" (Walton 1996). Everyday presumptive reasoning was classified in different "argumentation schemes," which represented how distinct types of conclusions can be supported by premises based on a limited set of rules of inference (Macagno and Walton 2015; Walton and Macagno 2009). Argumentation schemes are patterns of natural arguments, whose reasonableness and acceptability are constrained by specific defeasibility conditions, listed as a set of critical questions. An example is the argument for best explanation (Walton et al. 2008, pp. 329–30):

| PREMISE 1 | $D$ is a set of data or supposed facts in a case. |
|---|---|
| PREMISE 2 | Each one of a set of accounts $A_1, A_2,..., A_n$ is successful in explaining $D$. |
| PREMISE 3 | $A_i$ is the account that explains $D$ most successfully |
| CONCLUSION | Therefore, $A_i$ is the most plausible hypothesis in the case. |

A list of critical questions is associated to this scheme, pointing out the contextual conditions that need to be considered in developing or evaluating an argument based thereon:

CQ₁: How satisfactory is itself as an explanation of D, apart from the alternative explanations available so far in the dialogue?

CQ₂: How much better an explanation is than the alternative explanation so far in the dialogue?

CQ₃: How far has the dialogue progressed? If the dialogue is an inquiry, how thorough has the search been in the investigation of the case?

CQ₄: Would it be better to continue the dialogue further, instead of drawing a conclusion at this point?

The schemes are *dialectically* normative. They set out the conditions for a conclusion to be presumably acceptable, as arguments cannot establish "truth" but rather a defeasible presumption in favor of a conclusion, which shifts the burden of disproving it onto the interlocutor (Walton 1996). Argumentation schemes indicate the types of presumptions used to justify a conclusion, and the defeasibility conditions (the critical questions) that shift the burden back onto the speaker.

In this sense, the semantics of arguments is inherently dialectical. Schemes are defined by rules of inference that are commonly accepted, and thus presumptively accepted by everyone. However, their use is defeasible, and under certain conditions cannot be presumed to be acceptable without providing reasons. Argumentation schemes regulate the shift of presumptions, considering the type of dialogue and the context in which an argument is used.

## 4. Extending the boundaries of argumentation theory

Walton's pragmatic theory of argument influenced several fields of research and inspired both theoretical and empirical paths of investigation. Artificial Intelligence, education, legal theory and methodology, and medical communication are some of the most important areas that developed some fundamental principles of Walton's theory, including specific tools such as the types of dialogue, the pragmatic approach to fallacies, and the argumentation scheme.

*Artificial intelligence* is certainly the field that was most receptive of Walton's insights, which were used in several research trends such as multiagent systems, argument diagramming and representation, argument mining, argument assistance and decision support systems (Macagno 2021; Reed 2021). Walton has inspired ways for autonomous systems to take a step closer to represent or interpret natural dialogue. His pragmatic classification of dialogue elements such as argument schemes (Walton et al. 2008) and dialogue types (Walton and Krabbe 1995) makes it particularly suitable to formalization and automation.

Argumentation schemes inspired methods to construct arguments and knowledge for reasoning with conflicting and incomplete information in AI systems. Schemes have been formally modelled in computational argumentation frameworks (Atkinson and Bench-Capon 2007; Dung et al. 2009; Gordon et al. 2007; Modgil and Prakken 2014) where critical questions become a guide to represent attacks between arguments, resulting in formal methods used in critical domains such as law and medicine (Atkinson and Bench-Capon 2021; Sassoon et al. 2021).

The most ambitious use of the schemes in AI is argument mining, namely the automatic detection of arguments in texts. Argumentation schemes provide criteria for recognizing a limited number of patterns representing most of natural arguments (Cabrio et al. 2013), even though incomplete and based on an extremely complex ontology (Liga and Palmirani 2020). Schemes, however, allow the identification of keywords that can guide the mining process (Green 2018; Lawrence and Reed 2020), which is particularly effective when combined with other textual features such as scheme structure of topical similarity (Lawrence and Reed 2016). The classification of the schemes has been also used for creating pipelines, narrowing the automatic classificatory decision process in binary oppositions (Liga and Palmirani 2019 a, b).

The model of types of dialogue, governed by specific rules and procedures, has become a reference point in formal systems (Walton 2006, 2010 b; Walton and Toniolo 2016; Walton et al. 2016). Following Walton's initial dialogue types (Walton 1989), Walton and Krabbe's typology (Walton and Krabbe 1995) has influenced the development of argumentation based dialogue

systems for facilitating communication and reasoning between agents (McBurney and Parsons 2002; Reed 1998). Each dialogue type differs in goals and aims of participants and therefore shapes the design of the protocol that governs the exchange of claims, and arguments. An argumentation-based dialogue has typically an opening stage, an argumentation stage, and a closing stage. Agents engaging in a dialogue require rules to define existing moves (locution rules), allowed moves (structural rules), players' commitments (commitment rules) and how a dialogue terminates (termination rules) forming the communication protocol (Walton and Krabbe 1995). A variety of formal dialogue models have followed the typology adapting and extending protocols to represent complex sequences of agent interactions for specific dialogue types (Prakken 2018, sec. 3).

Further research has focused on deeper understanding of the differences between dialogue types and their effects in protocol design. For example, persuasion and deliberation may both be about alternative courses of action but the goal is different where the former starts from a disagreement on a course of action, and the latter from seeking a solution that is best for the group (Atkinson et al. 2013). Among the significant contributions in designing computational dialogue systems, Walton's research provided fundamental insight in how deliberation unfolds, leading to differences in how protocol rules are set out (Atkinson et al. 2013; Walton 2006, 2010 b; Walton and Toniolo 2016; Walton et al. 2016). His views deliberation as a dynamic process of identification of alternatives, consideration of new information that changes the current circumstances leading to a revision of the issue set out at the initial stage (Walton et al. 2019). This affects structural rules of the dialogue, termination conditions as well as the allocation of global and local burden of proof (Atkinson et al. 2013; Walton et al. 2015, 2019). Walton's deliberation models provide opportunities to develop agent dialogues with richer elements which are closer to natural deliberation and can provide support to human deliberation in a more effective way (Walton et al. 2016).

Another fundamental area that embraced Walton's ideas is *education*. The role of argumentation in education is crucial (Rapanta

et al. 2013). Critical thinking is frequently referred to as a central goal of education, and the capacity to develop, interpret, and assess arguments is one of the criteria underlying the capacity to communicate, reason mathematically, and learning to learn according to the Recommendation 2006/962/EC (European Union 2006). However, the interactions between the more empirical field of education and the philosophical approach to arguments have been limited.

Walton's theory contributed immensely to establishing a dialogue between these two areas, providing methodological instruments addressing the three pragmatic dimensions of arguments. First, the crucial role of the others' commitments in the development and use of arguments became one of the pillars of Kuhn's work, devoted to designing and testing empirically educational strategies for developing argument skills (Felton and Kuhn 2001, p. 150; Kuhn and Udell 2003). Second, the dialectical semantics of argumentation schemes has been used for training students to assess their own and the others' arguments (Nussbaum 2011; Nussbaum and Edwards 2011; Nussbaum et al. 2019) or develop more complex argumentation skills such as addressing implicit premises, often sources of deeper disagreements (Mayweg-Paus et al. 2016). Finally, Walton's types of dialogue have been used for analyzing the pedagogical dialogue, and identifying the best dialogical strategies for managing different classroom activities (Bereiter and Scardamalia 2016; Gregory 2007; Rapanta 2019; Rapanta and Christodoulou 2019).

*Legal reasoning* has been one of the domains of practice to which Walton applied and tested his theory. Argumentation is an essential dimension of legal theory and practice. Arguments are not only the core of legal discussions, judgments, and briefs, but also the instruments of legal interpretation (Araszkiewicz 2021). Walton's model for representing the argumentative structure of legal reasoning and assessing dialectically evidence, presumptions, and the strength of arguments (in particular from expertise and witness) (Walton 2002, 2007) has inspired different trends of research.

In the specific field of AI and law (Atkinson and Bench-Capon 2021), argumentation schemes have been integrated in formal

systems (Verheij 2003) and software for diagramming and weighting the strength of arguments (Bex and Reed 2011; Gordon et al. 2007; Gordon 2010; Sartor et al. 2014; Walton and Gordon 2012; Walton et al. 2016; Zagorulko et al. 2019, 2020), allowing the user to visualize and identify all the aspects and potential problems of complex argumentative networks.

Statutory interpretation has been commonly analyzed and assessed considering the so called interpretative arguments (MacCormick and Summers 1991; Tarello 1980), maxims or canons (Greenawalt 2015; Scalia and Garner 2012). Walton's argumentation schemes were used to translate them into patterns of argument, which organize the dozens (or hundreds) of canons in a definite number of invariant patterns, applicable in different legal systems (Macagno et al. 2018; Walton et al. 2021). The dialectical nature of argumentation schemes has also led to research on the role of legal presumptions and the burden of proof allocation, allowing predicting the effects of specific arguments or evidence on a legal dispute (Bex and Walton 2012; Godden and Walton 2006; Gordon et al. 2007; Hahn and Oaksford 2007).

Walton devoted some early works to the use of arguments in *medicine and medical decision-making* (Walton 1979, 1984, 1985; Walton and Hobbs 1985), opening a new line of research. Walton's ethical argumentation, rooted in specific argumentation schemes and the assessment of ethical propositions in the context of other commitments, justifications, and circumstances  (Walton 1985), and his dialogical models of deliberation led to innovative trends of research, including expert decision-making, doctor-patient deliberation, and public communication. The dialectical nature of argumentation schemes has been applied to clinical decision support systems, which through the collection, comparison, and interpretation of the data from different sources can suggest justifications and reasons for treatment options. Schemes allow translating the network of evidence into arguments usable by physicians, assessable through the critical questions (Sassoon et al. 2021; Walton et al. 2021), or eliciting the necessary evidence from the sources, allowing the development of a grounded argument (Tolchinsky et al. 2006).

Argumentation schemes have been also used for assessing the communication of medical information to the public, and in particular the role of experts (Cummings 2014, 2020, 2021). Finally, doctor-patient decision making has been represented and analyzed through the development of dialogue types in discourse moves, identifying the patterns that elicit and address the deeper conflicts of values, resulting in more customized decisions (Bigi and Labrie 2016; Lamiani et al.; Macagno and Bigi 2020; Rossi et al.).

At a theoretical level, the challenges that Walton's works offered have been only partially explored. In *philosophy of language*, his ideas inspired new approaches to pragmatic phenomena, such as relevance, speech acts, presupposition, and implicatures (Macagno 2015, 2018; Macagno and Walton 2013; Quandt and Licato 2021). However, many paths of philosophical inquiry that he traced with his papers are still to be rediscovered. An example is philosophy of religion, and biblical interpretation, which he addressed considering the problems of evil and the characteristics of God (Walton 1975 a,  b, 1977). Or the possibilities that a dialectical theory of arguments offers to field of cognitive psychology (Walton 2010) or even counseling psychology.

## 5. This special issue

This special issue brings together three main areas of contributions demonstrating examples of the importance that Douglas Walton's has had and continue to have in several research areas. The first three papers of this issue address the pragmatic role of argumentation, and its impact on discourse analysis and philosophy of language. The fourth and fifth articles are devoted to the influence of Walton's dialogue and argument theory in education. The last two papers highlight the philosophical challenges resulting from of argumentation schemes and Walton's approach to burden of proof and presumption.

In the first part of this special issue, three papers expand on the pragmatics of argument, where arguments as instruments for resolving a misalignment of opinions between different parties.  In "Is every definition persuasive? Douglas Walton on Persuasiveness of definition," Jakub Pruś and Andrew Aberdein start from Walton's analysis that persuasive definitions are a particular kind

of argument consisting of redefining a term in support of a conclusion. As the title suggest, a question is raised as to whether all the definitions are persuasive. Different criteria to evaluate the persuasiveness of a definition are discussed, showing how the pragmatic dimension of the use of a definition in a specific context is the fundamental aspect which determines when a definition can be considered persuasive or not.

The persuasiveness of communicative elements is echoed in the paper "A pragmatic account of rephrase in argumentation: Linguistic and cognitive evidence." Marcin Koszowy and colleagues show how rephrasing has a pragmatic and rhetorical role of persuading an audience in natural contexts. Their proposal is the result of a comprehensive analysis of a variety of rephrasing uses through different linguistic and cognitive lenses. The paper presents a corpus of rephrasing statements followed by a crowdsourced experiment demonstrating that rephrasing schemes are purposely used for their persuasive effect.

In "Argumentation profiles and the pragmatics of argument," Fabrizio Macagno organizes Walton's developed tools for analysis of argumentative texts into a practical method to identify an argument profile. Profiling is an assessment of the argument alongside three dimensions: dialectical, which determines the identification of an argument type; evaluative, consisting in the analysis of the quality of the argument by detecting fallacies or lack of evidence; and rhetorical, where the analysis of emotive words help identify manipulative tactics. By profiling the argumentation of three politicians, Macagno shows how this toolkit provides a systematic and rigorous approach to compare how arguments are instrumentally used by their speakers.

Walton's influence on different fields of research is exemplified in the next two papers of this special issue, devoted to argumentation and education. In "Douglas Walton's contributions in education: a synthesis of theoretical and empirical research," Chrysi Rapanta provides a review of the uses and applications of Walton's theories in educational research. The paper demonstrates how argumentation schemes, critical questions, and dialogue types have been used to develop methods to foster student reasoning skills and organize dialogue in learning environments. The paper

highlights the potential and opportunities of adopting Walton's argumentation and dialogue theory to advance education research.

The perspective adopted in the following paper illustrates how Walton's approach can become the backbone of empirical studies. In "Argumentation as a collaborative enterprise: A study of dialogic purpose and dialectical relevance in novice and experienced arguers," Mark Felton and Amanda Crowell discuss how argumentative dialogue can support learning among students by promoting explanation, critique, and reconstruction of knowledge. Through an empirical study, they address the question of how discourse unfolds when the goal of the dialogue and the expertise of the arguers differ. Building on the basic notions of Walton's pragmatics of argument, they show how the differences between experienced and novice arguers correspond to distinct dialogical abilities, including relevance, collaborative thinking, and the capacity to pursue distinct dialogical goals. Finally, they provide insights in how different types of dialogue may promote active engagement in student learning.

The theoretical aspects of Walton's theory that have most influenced the field of Artificial Intelligence—argumentation schemes and the dialogue theory—are discussed in the last part of the special issue. In "An epistemological appraisal of Walton's argument schemes," Christoph Lumer provides an extensive critical analysis and evaluation of argumentation schemes, their abstract structure, and their intended uses in dialogue and computer systems. The paper explores the dialectical and enthymematical nature of schemes and addresses the question on whether these provide sufficient grounds to justifying beliefs and knowledge. The analysis reviews argumentation schemes under their effectiveness, completeness, efficiency, and justifications providing insight into their adequacy to draw valid conclusions.

In the last paper, "Burdens of proposing: On the burden of proof in deliberation dialogues," David Godden and Simon Wells present a careful analysis of Walton's work on the lack of global burden of proof in deliberation dialogue. The authors revisit the question of whether there is such a burden in deliberation, suggesting that there are burdens in proposing a course of action that have been overlooked. Through the analysis of a dialogue, the paper

shows that there are expectations in different phases of deliberation, and the proposer must meet standards of proof when advancing a proposal. This paper highlights how an apparently simple example of everyday deliberation reveals complex procedures that need further research. The new proposal sets out future opportunities to further research in computational as well as logical models of deliberation.

## Acknowledgments

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