UNIVERSITY OF SOUTHAMPTON

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Electronics and Computer Science

An Investigation into Eristic Argumentation on the Social Web

by

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ABSTRACT

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Argumentation, debate and discussion are key facets of human communication, shaping the way people form, share and promote ideas, hypotheses and solutions to problems. Argumentation can broadly be broken down into collaborative problem solving or truth-seeking (known as dialectic argumentation) and quarrelling without hope for a resolution, either aggressively or for the purpose of recreation, catharsis or entertainment (known as eristic argumentation). Techniques used within argumentation can likewise be classified as primarily fact-based (logical), or emotion/audience-based (rhetorical).

The social web, consisting of the people, tools and communities that form over the world wide web, is a growing way in which individuals, social groups and even corporations share content, ideas and information, as well as hold discussions and debates. As the social web becomes more widely used, the potential for using it as a means to study how people communicate and collaborate on an enormous scale dramatically increases. Current models of argumentation often focus on formal argumentation techniques, in which participants are expected to abide by a stringent set of rules or practices. However, on the social web there is no such code of conduct. Antisocial behaviour, which often stems from argumentation, can have a negative impact on online communities, driving away new users and stifling participation.

Case-studies were carried out on three different areas of the social web to determine the strengths and weaknesses of modelling social, eristic argument on the web when using current models and ontologies. This preliminary work indicates that existing techniques for modelling argumentation are insufficient to capture the structure and dynamic of argumentation taking place on the social web.

Following this, augmentations were made to current modelling ontologies for the purpose of capturing a sub-set of rhetorical tactics. These were then used as part of an investigation re-examining the previous case studies to determine the prevalence of rhetorical tactics in argumentation within areas of the social web as well as investigating correlations that may be drawn between the use of these tactics and the machine-readable characteristic of the post (e.g. length, word-complexity, etc.). It was found that even this small sub-set of rhetorical tactics was regularly employed throughout each case study. Correlations between tactics and post features were also found, although these were not conclusive due to the discrete and binary nature of the features examined.

Based on these observations, future work will focus on extending the argumentation model further to capture additional rhetorical information, due to the importance of these types of interactions. This will be used in an experiment to analyse how different rhetorical and eristic features impacts users of the social web participating in discussion, and how this affects their perceptions of the topic and engagement with the argument. The results of this can then be used to further supplement the model of eristic argumentation on the web.

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Declaration of Authorship

I, Tom Blount , declare that the thesis entitled *An Investigation into Eristic Argumentation on the Social Web* and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
- where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
- where I have consulted the published work of others, this is always clearly attributed;
- where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- parts of this work have been published as: (Blount et al., 2014), (Blount et al., 2015a), (Blount et al., 2015b) and (Blount et al., 2016)

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Acknowledgements

Thanks to...

Chapter 1

Introduction

"A man may be objectively in the right, and nevertheless in the eyes of by-standers, and sometimes in his own, he may come off worst" – Schopenhauer, The Art of Always Being Right

1.1 Problem Space and Motivation

Argumentation is fundamental to human communication – it is how people share new information and new ideas, and propose courses of action that see them carried out (Hahn et al., 2005; Moor and Aakhus, 2006). As a result, there is a large amount of research on argumentation from a wide variety of disciplines and topics, including: philosophy, and the nature of fallacies and how they may be critically appraised (Tindale, 2007); sociology, and the need to differentiate between classical logic and social argumentation due to the need for the capability to reason using only partial knowledge (Pólos and Hannan, 2002); law, and the need for measures of certainty and belief when modelling and reasoning over assertions (Bertea, 2004); and artificial intelligence, and the use of agent-based systems such as dialogue games, as methods for reasoning over argument to determine the victor or the correct course of action (Bench-Capon and Dunne, 2007; Karunatillake et al., 2008).

Argumentation can be (broadly) separated into two categories based on the goals and intended outcome. Firstly, dialectic argument, in which the participants are engaged in rational discourse with the aim of either discovering the particular truth behind a matter, or formulating a solution or resolution for a set of circumstances (Kerferd, 1981). Secondly, eristic argument, in which there is no clear goal and the participants are not trying to come to a resolution but are quarrelling with the aim of being seen to win, either in the eyes of their opponent or, more often, in the eyes of spectators (Kerferd, 1981; Jørgensen, 1998). Arguments can shift between these two forms, or contain "pockets" of one form within the other. Orthogonally to this, there are the notions of logic and rhetoric. While often used in modern parlance as a pejorative term, rhetoric is simply the art of discourse, and convincing an audience to one's point of view based on one's knowledge

of the topic at hand and, crucially, one's knowledge of the audience themselves (which clearly lends itself to the eristic form) whereas logic deals with reasoning between established facts (which lends itself to the dialectic form).

However, as Van Eemeren and Grootendorst (2004) note, *"perhaps out of fear of metaphysics or of 'psychologizing,' present-day logicians tend to concentrate exclusively on formalized arguments that lack any direct relation with how argumentation is conducted in practice."* Social argumentation, or the way people argue day-to-day, often has a very different structure to formalised models. In these instances, the aim of a proponent is not to prove themselves right through irrefutable logic, but simply to make others believe that they have proved themselves right.

This is particularly relevant when applied to the social web. As a network of social relationships that are created, formed and maintained through the world wide web, the social web (and the social media presented across it) are rife with discussion, debate, and argumentation (Rowe et al., 2011). As the web (and in particular the number of people, tools and communities that make up the social web) grows and becomes totally ubiquitous (Smith, 2009, p. 559), the potential for using it to investigate how truly massive communities interact, communicate and argue increases dramatically. However, the social web presents a number of challenges for extracting and analysing arguments, particularly due to the lack of clear indicators of argument structure. This problem is compounded by the type of language used; often highly informal, incorporating slang and irregular punctuation and grammar (Schneider et al., 2012), and by the number of distinct social platforms, each with their own constraints and cultures (Hanna et al., 2011).

There are a number of challenges when considering maintaining the social web as an inclusive platform for diverse and vibrant content, especially debate and discussion. There is a tendency for users to interact and associate with others who are similar in terms of traits, (such as race, age, or education) and beliefs (such as religion or politics), known as homophily (Sherchan et al., 2013) and is compounded by the introduction of "filter bubbles", the effect of content providers tailoring search results or default displays towards the preferences of individual users (Pariser, 2011). This can lead to sites becoming "echo chambers" in which well-known views and opinions are repeated, little original content is produced and there is virtually no dissent or debate (Gilbert et al., 2009). This can be further exacerbated by reputation systems, enforcing which views are acceptable in a given community by rewarding users who agree and punishing those who disagree, or those considered "outsiders" of the accepted group or culture. At the opposite end of the spectrum, where there is constant and stimulated debate, there is equal (if not greater) potential for conflict. While critical and reasonable debate, and even (respectful) recreational quarrels, are things to be encouraged, there is a visible tendency to "shout down" the opposition, including attempts to silence dissenting opinions through abuse and threats. As a result online communities can become incredibly hostile spaces, culminating in anti-social behaviour, including vulgar abuse and, at the most extreme, threats of sexual violence, and death threats (Willard, 2007; Jane, 2014).

However, in this document the case is made that disregarding these interactions from argumentation models is a mistake. Accurately modelling them is the first step towards understanding exactly how argumentation is applied across the social web, and the ways in which creators and consumers of social media engage with argumentation. This information can then be applied towards creating tools and environments that discourage these types of abuse to facilitate more social argumentation.

1.2 Hypothesis and Research Questions

One key feature of social argumentation is the notion of the (presence of) an audience (Van Eemeren and Grootendorst, 2004; Jiménez-Aleixandre and Erduran, 2007). The audience's perception of the argument is something that is often overlooked in formal models of argument, despite evidence that perception of argument can be altered through multiple means such as cultural associations (Suzuki, 2011), pre-existing biases (Arceneaux, 2012) or peripheral information(Lee and Shin, 2014). The ultimate aim of this research is to explore how perception of argumentation specifically on the social web can be altered based on the types of tactics used, and how this can be used to develop more thorough models of argumentation. To achieve this, it is first important to be able to correctly model and represent the arguments that occur socially. In this way, the key features of informal arguments can be identified and categorised. This can then be used to determine exactly which features of argumentation are considered most important by users, and those that they are most likely to engage, reply to, critique, and how these features shape users' overall interpretation of an argument. The work described in this thesis examines how formal models currently map arguments, and applies a combination of these models to an argument (or arguments) on the social web to determine which features are well captured, and those that are not. This has led to the formulation of a hypothesis that the presence of particular rhetorical tactics affects both a user's perception of an argument, and the way in which they engage with it.

This forms the basis of the hypothesis which is examined in the body of this thesis:

"A model of eristic argumentation on the social web should include both logical and rhetorical tactics, as the inclusion of rhetorical techniques affects the way in which users perceive and engage with the argument"

This can be resolved into three distinct research questions:

1. *Is modelling eristic argumentation a valuable direction of work?*
2. *Are current frameworks and tools sufficient to model eristic argumentation on the social web?*
3. *How should rhetorical techniques be included in a model of eristic argumentation on the social web?*

4. *Do rhetorical techniques affect the way in which users perceive and engage with the argument?*

Question one is perhaps the most important question, as it determines the overall value of this work. It is best answered in several different parts; firstly, by literature review, secondly, by an analysis of techniques commonly used in social argumentation, and thirdly by interviewing experts in fields that commonly use, model or support argumentation.

Question two focuses on determining whether it is currently possible to accurately describe argumentation occurring on the social web in terms of pre-existing models. Through a review of existing literature and a short exploratory work in the area, the current state-of-the-art will be examined and their suitability at modelling personal, social, and rhetorical argument will be evaluated.

Question three revolves around the most appropriate means of representing rhetorical tactics. Clearly, providing an exhaustive list of all possible examples of rhetorical tactics would not only be infeasible, but also unlikely to provide any value to modellers or analysts. Therefore, to determine the most effective means of representing these tactics, modellers and analysts should be consulted to determine the most effective method, with an emphasis on the purpose of use.

Question four focuses on the practical implications of this work; that is to say, whether the users of social media perceive arguments using different logical and rhetorical tactics in different ways, and whether this drives them to engage in different manners. This makes it important to define the terms perception and engagement. Perception can be thought of as the way in which users understand the tone, persuasiveness, entertainment value or information content of an argument (Sundar, 2000). Engagement, conversely, can be thought of as how likely they are to, and in which they respond to or participate in the argument itself. This not limited to replying to a post: users of social media can engage in multiple ways, including replying, sharing or voting (Markova and Petkovska-Mirčevska, 2013).

1.3 Report Structure

Background information on the topic area, both in argumentation and online behaviour, as well as the state of the research field at present, is discussed in Chapter 2. A preliminary investigation into the capabilities of current models of social argumentation, and an analysis of the results, is detailed in Chapter 3. In Chapter 4, these models are developed and adapted to encompass further social and rhetorical information, creating the Argumentation on the Social Web Ontology. This is used to examine the prevalence of a subset of rhetorical tactics in web-based argumentation and their correlation with machine readable features (such as post length, language, etc.). The model is developed further, with additional changes proposed, and review carried out in which experts in several relevant fields (argumentation modelling, linked-and-open data, the social web, and philosophy) were asked to complete a pair of modelling exercises both with and

without,the new additions, and then asked a set of semi-structured questions about their experience. Chapter 5 details further data collection and annotation from sources on the social web, this time in the context of discussions surrounding online news. Again, this data is analysed at a structural level, in terms of both the social structure and annotated techniques. A narrative analysis is then carried out, examining three individual threads as case studies. In Chapter 6, the data gathered in Chapter 5 is used to form the basis of an experiment into the perception of argumentation: how logical and rhetorical techniques affect the perception, and reaction to, arguments on social media. Finally, Chapter 7 summarises the overall findings of this body of work, discusses the implications, and makes some suggestions to how this work can be expanded in future.

1.4 Contributions

The work discussed in this thesis has formed the basis of a number of papers:

- Blount, T., Millard, D. E., and Weal, M. J. (2014). Towards Modelling Dialectic and Eristic Argumentation on the Social Web. In *14th workshop on Computational Models of Natural Argument*

  This paper discusses the preliminary work carried out in Chapter 3, in which an existing model of argumentation is applied to a set of discussions on the social web, an its overall effectiveness evaluated.

- Blount, T., Millard, D. E., and Weal, M. J. (2015a). An Investigation into the Use of Logical and Rhetorical Tactics within Eristic Argumentation on the Social Web. In *ACM Conference on Hypertext and Social Media*

  This work forms the first part of Chapter 4, in which the Argumentation on the Social Web Ontology is developed, and trialled on a sample of argument data taken from the social web.

- Blount, T., Millard, D. E., and Weal, M. J. (2015b). On the Role of Avatars in Argumentation. In *Proceedings of the 2015 Workshop on Narrative & Hypertext*, pages 17–19. ACM

  This paper presents a position on one of the issues considered out of scope of the main body of work presented here: namely, do avatars - the visual representation of a person in a virtual world (Bailenson and Blascovich, 2004) - affect they way in which people argue, or the way in which they perceive arguments from others.

- Blount, T., Millard, D., and Weal, M. (2016). An Ontology for Argumentation on the Social Web: Rhetorical Extensions to the AIF. In *International Conference on Computational Models of Argument*

This work concludes the work begun in (Blount et al., 2015a), developing the model further and presenting an expert review of the proposed changes. This forms the final part of Chapter 4.

Chapter 2

Background

2.1 Rhetoric and Argumentation

Rhetoric is often used in modern parlance as a pejorative to describe persuasive language that lacks substance, or containing empty or insincere promises; formally, however, it refers to the art of persuasion, whether spoken or written. In particular, it focuses on the act tailoring one's argument to the situation at hand based on knowledge of events and, crucially, knowledge of the audience (Corbett and Connors, 1999).

2.1.1 Modes of Persuasion

Aristotle, in his treatise on rhetoric, described three "persuasive modes" that can be employed in an attempt to sway an audience: through the words that are used (*logos*), through the character of the rhetor or their opponent (*ethos*), and through the emotions of the audience (*pathos*) (Kennedy, 1991). These modes may be applied individually, or in conjunction with one another. *Logos* describes an appeal to logic or reason. This is the method by which one might rationalise a position, often backing it up with evidence or statistics. It is important to note that, when enacting *logos*, it is not strictly necessary for the logic to be sound, or the evidence provided to be factual – it can be warped to fit a particular purpose, or even outright fabricated (however, this will usually also invoke another of the modes described below). The key element is that it appears to be reasonable and thus, appeals to an audience's sense of reason (Kennedy, 1991; Braet, 1992). *Ethos* is an appeal a person's character or sense of ethics and morals. This can be used in an attempt to strengthen the position of the rhetor's argument or to weaken their opponent's position. For example, if a rhetor can state that they are an expert in the field that they are debating then it is likely their audience will lend their argument more credence than if they were a novice. This specific case is known as an argument from authority, or *argumentum ab auctoritate* (Kennedy, 1991; Braet, 1992). Similarly, an argument can be made that attacks an opponents position indirectly, by attacking their credentials rather than refuting their claims

(*argumentum ad hominem*). Although such an argument is not logically sound (and constitutes a fallacy), it is still often used in practice and in certain circumstances is a viable (and often effective, if somewhat underhand) means of persuading an audience (Walton, 1987; Budzynska and Reed, 2012). Finally, *pathos* is an appeal to emotion, whereby an attempt is made to evoke a particular feeling in an audience in the hope that this will influence their opinion on a position. This can be done in both positive and negative terms. For example, flattering an audience, or promising them a boon, can shift them towards accepting a particular course of action. On the other hand, threatening them with the potentially undesirable consequences of their actions can cause them to reconsider even if these consequences are unlikely or, indeed, impossible. A classic example is the appeal to fear (*argumentum ad metum*) (Kennedy, 1991; Braet, 1992).

2.1.2 Dialectic and Eristic Argument

The terms dialectic and eristic were coined in Ancient Greece to describe modes of argumentation with different goals and were popularised in Plato's *Republic* (Plato, 80BC). A dialectic argument takes the form of two or more parties engaged in rational discourse with the aim of either discovering the particular truth behind a matter, or formulating a solution or resolution for a set of circumstances (Kerferd, 1981). For example, an academic presenting their findings and rationalising that they are indeed valid, given the rigorous methodology they have used and the weight of evidence this has provided is an example of a dialectic argument. Likewise, a peer reviewer that disagrees with the findings by pointing out a specific flaw in the experimental methodology and explaining how this should be resolved, is another example. The arguments tend to rely heavily on the mode of *logos*. In contrast, an eristic argument is an argument in which there is no clear resolution in the minds of the participants: they are not motivated by solving a problem, or convincing their opponent, but to be victorious (Kerferd, 1981). There may be different reasons for arguing in this vein, from quarrelling for its own sake as a form of catharsis (Schneider et al., 2014), to being seen to "win" the argument in the eyes of spectators (Jørgensen, 1998). As a result, these arguments chiefly favour the modes of *ethos* and *pathos*.

TODO: Polemics (Lemaitre and Noriega, 2015)

2.1.3 Modelling Argument

There are many different models and frameworks used to capture particular aspects of argumentation. These aspects include notions of trust (Wigmore, 1913, p. 752), focus on argument topic or chronology (Klein, 2010) and the ability to demonstrate support for or refutation of other points in the structure (Dung, 1995). Some examples are discussed below, with respect to their technical structure, their influence in the field and their practical applications.

2.1.3.1 Toulmin Model

Toulmin developed his model from the school of philosophy in the 1950s as a means of demonstrating an approach to practical (rather than theoretical) argumentation, by attempting to show the internal structure (and thus, consistency) of an argument (Toulmin, 1958). The general form of Toulmin's argument, shown in Figure 2.1, follows the structure of a *claim*, or conclusion, that is backed up with generally agreed upon facts (the *data*). The *claim* can be *qualified* ("definitely", "maybe", "probably", etc.) and any potential *rebuttals* accounted for. Then, key to the Toulmin model, the *claim* and *data* are connected using either an implicit or explicit *warrant*, or justification – this can then be supported by a particular *backing* (Verheij, 2005, p. 347-350). A specific example can be seen in Figure 2.2, which shows an argument reasoning that Alice is a British citizen. Toulmin's model has been a particularly influential piece of work and has had an impact of decades of argumentation research in fields as far ranging as law, rhetoric and education (Newman and Marshall, 1992, p. 8-10; Schneider et al., 2013, p. 5, 12). However, there has been discussion as to the effectiveness of different aspects of the framework. In its favour, the means of explicitly stating the connecting warrant (and associated backing) can improve cross domain discourse. On the other hand, because models themselves are focused towards internal structure, there is no criteria for modelling overall structure (such as a group of arguments that refutes or support one another's claims). There is also no concept of resolving an argument (for example, on the grounds of logic or value); although this may have been by design, it negates the possibility of evaluating the strength of a given argument (Newman and Marshall, 1992, p. 349-350; Verheij, 2005, p. 5, 12). Among other applications, the Toulmin model has been incorporated into the Argument Model Ontology[1], an OWL ontology to allow classification of academic arguments. This is used in conjunction with CiTO, an ontology for factually and rhetorically categorising citations (Peroni and Shotton, 2012, p. 8).

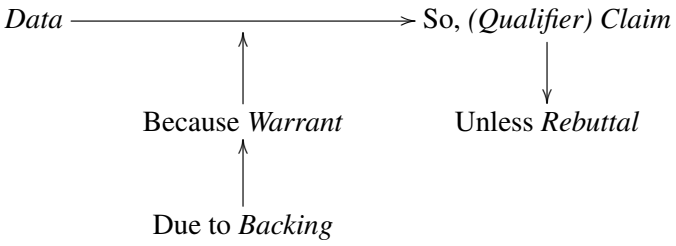


Figure 2.1: General form of Toulmin's diagram (Toulmin, 1958, p. 104)

[1] http://www.essepuntato.it/2011/02/argumentmodel

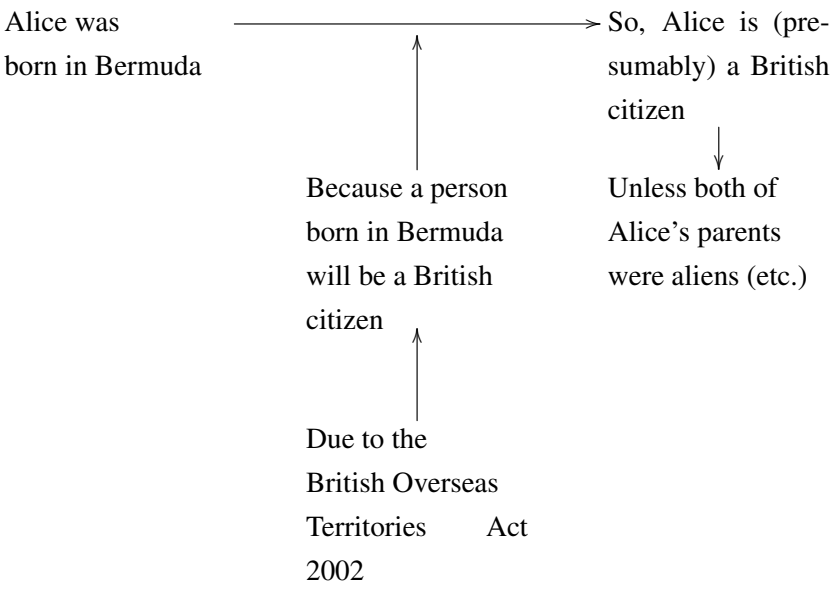


Figure 2.2: Example usage of Toulmin's diagram (Toulmin, 1958, p. 105), examining whether Alice is a British citizen

2.1.3.2 Information-Based Issue Systems

Information-Based Issue System (IBIS) models are a particular type of dialectic process originally designed to aid in solving so-called "wicked problems" (Kunz and Rittel, 1970) – problems of social policy to which there is no clear definition, methodology or even end-goal (Rittel and Webber, 1973). IBIS models are represented as trees, made up of four different types of node. Firstly, *Issues* represent the problems that need to be solved, or questions that must be answered. Generally, there is one "root" *Issue* to be deliberated, but other sub-*Issues* can be created as necessary during the reasoning process. *Ideas* are proposed solutions or answers to these *Issues*, and each *Idea* can then be weighted positively or negatively using *Arguments For* and *Arguments Against*. IBIS models have seen wide usage in the field of design rationale and cognitive ergonomics where the assimilation of collective knowledge is required to solve problems (Conklin and Begeman, 1987; Aurisicchio and Bracewell, 2013). An example usage of an IBIS model is shown in Figure 2.3. Because of its dialectic context, the application of IBIS models is ideal when two or more parties are trying to resolve a complex problem, especially if they have differing (or even opposing) stakes. As might be expected, there are many IBIS-like systems used in system-design and knowledge aggregation. Delibatorium[2] is a tool, developed by Klein (2010) of MIT, that uses an IBIS approach to solving challenging problems such as *"Is carbon offsetting a good idea?"*. The IBIS approach is invoked to aid the collaboration of large amounts of people separated across space and time by preserving a topic-centric (rather than time-centric) structure. IBIS structures have also been included in an extension to the SIOC

[2] http://deliberatorium.mit.edu

ontology devoted to representing argumentation[3]. This ontology uses the IBIS notation of *Issues* and *Ideas* to formalise the process of solving a problem over social media (Lange et al., 2008).

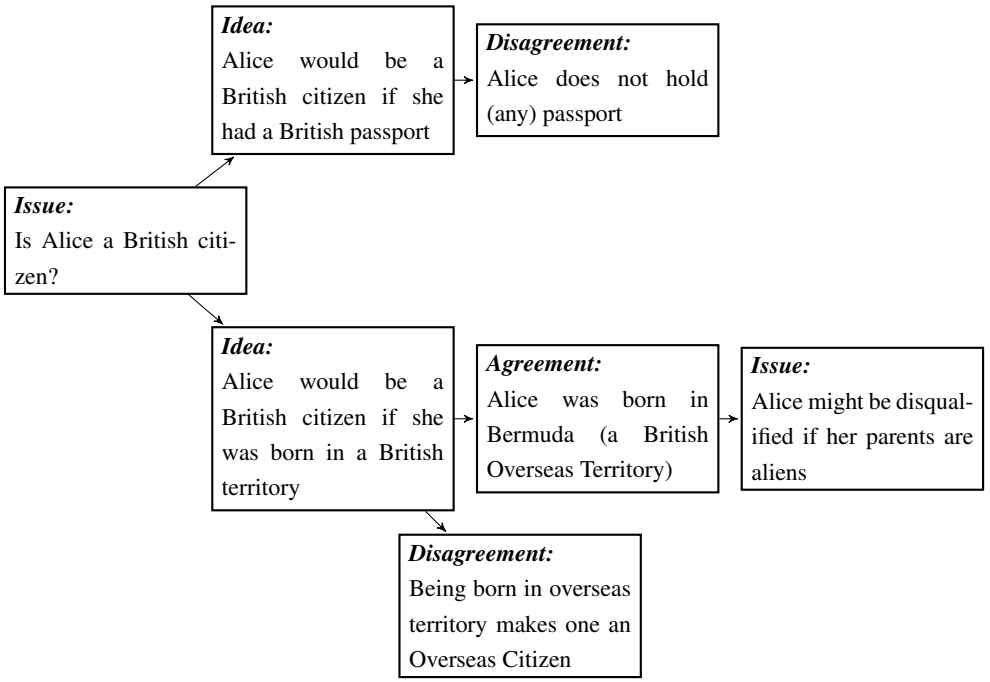


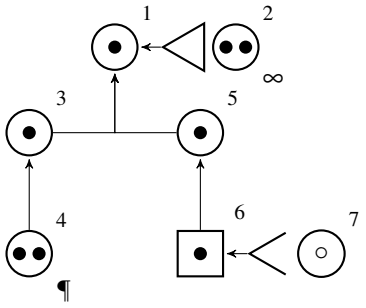
Figure 2.3: Example usage of an IBIS model, examining whether Alice is a British citizen

2.1.3.3 Wigmore's Chart

"Wigmore's chart", conceived in 1913, is a means of recording argumentation originally devised for use in legal trials. The chart models the chain of interactions between competing arguments from both participants and can be used to evaluate the overall conclusion that should be drawn (Wigmore, 1913, p. 751). It takes the form of a directed graph where each node represents a particular fact. The shape of each node relates to the nature of the assertion; squares represent testimony given under oath; a triangle represent an explanation of or support for the node it "points" to; an open angle refutes the argument it points to and all other assertions (such as claims, physical evidence or related legal statutes) are represented by circles. These can additionally be marked to denote arguments by the defence or prosecution, but are not discussed here for clarity (Chalamish et al., 2011, 2013). Symbols relate further information about the nature of these assertions: an infinity symbol (∞) states that a node denotes sensory evidence that may be (re)produced in court; a pilcrow (¶) denotes an assertion that can be taken as fact with no further evidence (such as a precedence case); a lack of a symbol shows that the claim is implied from further reasoning in the graph. In addition, Wigmorean analysis can incorporate the notions of *strong belief* (●●), *belief*(●) *doubt* (?) *disbelief* (○) and *strong disbelief* (○○) (Wigmore, 1913,

[3]http://rdfs.org/sioc/argument

p. 751-756; Goodwin and Fisher, 2000). Little is known about precisely how often this type of analysis is used manually, although it is thought that it is carried out in courthouses around the world (Chalamish et al., 2011). However, efforts are being made to automate the process by parsing the natural language propositions made in court and transforming these into a Wigmore diagram to aid judges, barristers and juries in their deliberations (Chalamish et al., 2013).



1 Alice is a British citizen

2 Alice has a British passport

3 A person born in a British territory will be a British citizen

4 British Overseas Territories Act 2002

5 Alice was born in Bermuda

6 Alice's parents testify that she was born in Bermuda

7 Alice's parents' testimony could be biased in her favour

Figure 2.4: Example Wigmore graph, examining whether Alice is a British citizen

2.1.3.4 Dung's Framework

Similar to Wigmore's method, Dung's framework (which uses the format of set theory) focuses on the aspect of arguments attacking, (implicitly) supporting and, ultimately, defeating one another (Dung, 1995). Dung defines an *Argument Framework* as a pair such that $AF = \langle AR, attacks \rangle$ where AR is a set of arguments $\{a_1, a_2, ..., a_n\}$ and $attacks$ is a binary relation such that $attacks \subseteq AR \times AR$. $attacks$ describes which arguments are "defeated" by one another: for example, if a_1 is the argument "Alice is not a British citizen" and a_2 is the argument "Alice has a British passport" then $(a_2, a_1) \in attacks$. The set of *conflict free* arguments is a maximal set of arguments that do not attack each other. An argument a_1 is *acceptable* with regard to a set of arguments S if there is no argument a_2 that attacks a_1 that is not itself attacked by an argument in S. A set of arguments is *admissible* if each argument is considered *acceptable* with respect to the set. The maximal *admissible* set is known as a *preferred extension* (Schneider et al., 2013).

TODO: Other extensions There have been a number of extensions to this framework. Bench-Capon and Dunne (2002) have extended this framework to incorporate the idea of "value" or principle to arguments. When circumstances arise such that two possible resolutions to a dispute are equally (logically) valid, different audiences will have differing preferences based on the principles they feel are most important. For example, say that two solutions for combating

crime are put forward: reading the general public's private correspondence or an expensive social program of education and rehabilitation. If each has been proven to be equally effective, audiences that value minimisation of cost may favour the former whereas audiences that value individual privacy might choose the latter. Dunne (2016) incorporated this to TODO: FINISH

2.1.3.5 ASPIC

TODO: EXPAND THESE

2.1.3.6 ASPIC+

2.1.3.7 IMPACT structured consultation tool

TODO: THIS (Wyner et al., 2011)

2.1.3.8 The Argument Interchange Format

The Argument Interchange Format (AIF) is a framework for representing argumentation as a directed graph (Chesñevar et al., 2006). Created as part of the Argument Web project (Rahwan et al., 2007), which aims to link the concepts of natural language argumentation with abstract mathematical modelling (including capturing *"linguistically sophisticated manoeuvres"* (Bex et al., 2013)), the AIF is primarily a description, with specifications in a number of languages including RDF and SQL.

At its highest level, the AIF can be conceptually divided into an "upper" ontology and a "forms" ontology. The upper ontology consists of the building blocks of the argument structure, while the forms ontology applies context, for example, by differentiating between logical attacks based on faulty evidence, witness bias, or appeals to authority. The data, claims and conclusions that make up the argument are modelled by Information nodes (I-nodes). There can be no direct relationship between I-nodes. Instead, there must be an intermediary Scheme node (S-nodes). These S-nodes are subdivided into three applications: Rule of Inference Applications (RA-nodes), Conflict Applications (CA-nodes) and Preference Applications (PA-nodes). RA-nodes and CA-nodes simply denote an inference or conflict (logical or otherwise) between one or more pieces of information. PA-nodes, however, denote a preference of one piece of information over another. For example when discussing economics, while it may be difficult to logically prove the superiority of a regulated market over a free market, or vice-versa, the personal beliefs and preferences of proponent and opponent will feature heavily in their reasoning on such issues (Bench-Capon and Dunne, 2002). This structure is displayed in Figure 2.5.

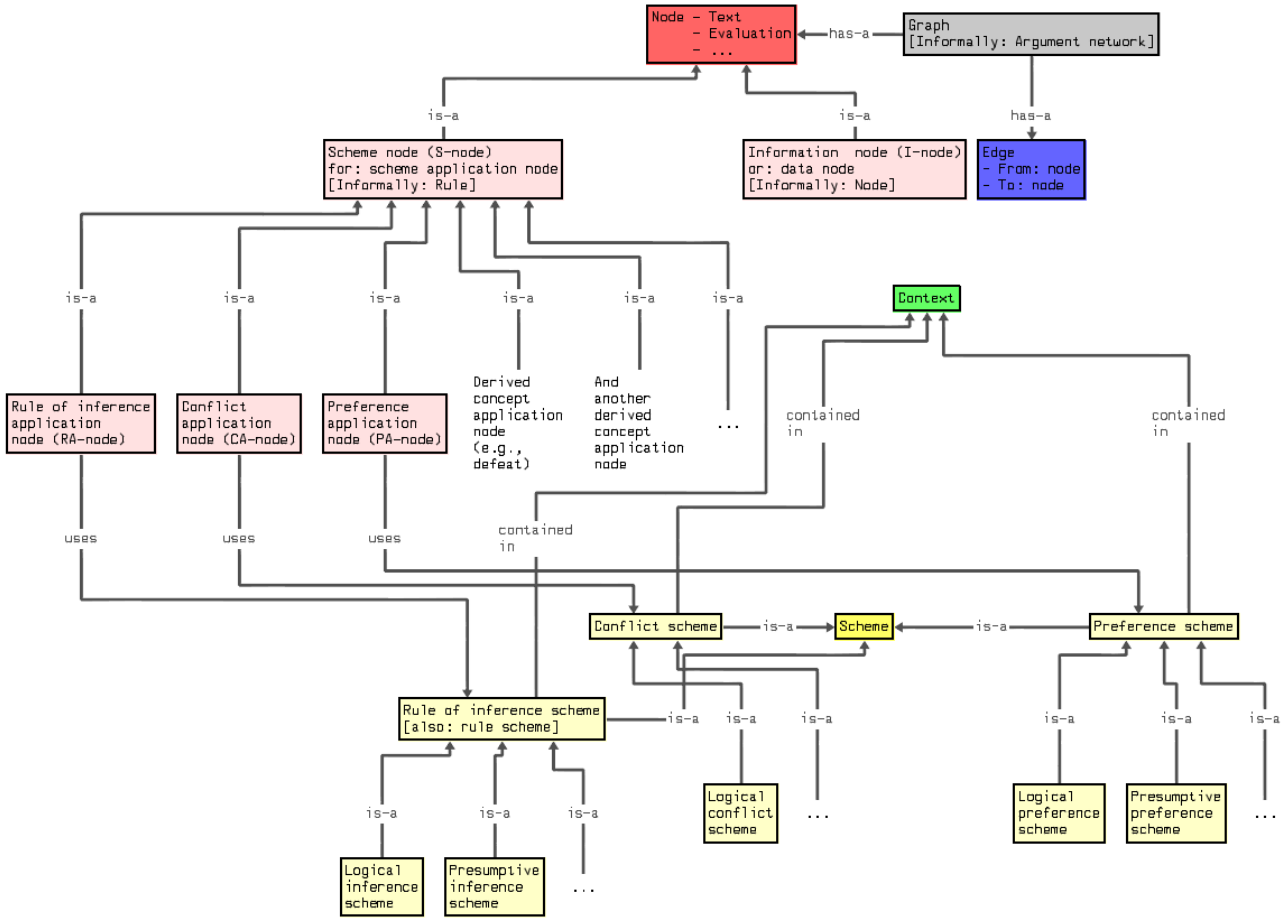


Figure 2.5: An overview of the AIF Ontology (Chesñevar et al., 2006)

2.1.3.9 AIF+ and Inference Anchoring Theory

TODO: Expand details from IAT paper

In their work on an extension to the AIF, dubbed the AIF+, Reed et al. build on the work of O'Keefe to differentiate between two separate notions of argumentation (O'Keefe, 1992; Reed et al., 2008): the first, which they term argument$_1$, is a logically constructed set of claims and evidence used to back these claims (or attack other claims), as in *"Alice put forward her argument"*. The second, termed argument$_2$, refers to a dialogue – the exchange of ideas and opinions between two or more people, as in *"Alice and Bob were having an argument*. A result of this work was to introduce a new set of nodes. The first, a subset of I-nodes dubbed Locutions (L-nodes), model locutionary acts (or utterances) in an argument$_2$. That is, they record precisely what was said. The second, a subset of S-nodes dubbed Transition Applications (TA-nodes), represent transitions between L-nodes (with associated forms such as a challenge or response). Thirdly Illocutionary Applications (YA-nodes), also a subset of S-nodes, represent the "illocutionary force" and serve to link each argument$_1$ to the overall argument$_2$. Figure 2.6

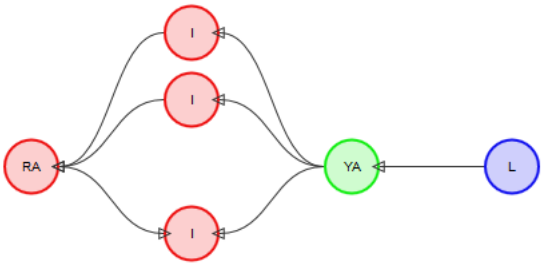


Figure 2.6: Visualisation of a simple AIF+ graph

shows how this structure can be visualised. Consider the locution *"All men are mortal, and Socrates is a man. Therefore, Socrates is mortal."* The statement itself is modelled using the L-node on the rightmost side of the diagram. On the leftmost side is the core AIF structure, which show the premises formed as two I-nodes (*"Socrates is a man"* and *"All men are mortal"*), linked to the conclusive I-node (*"Socrates is mortal"*) by way of an RA-node. The L-node is connected to this argument$_1$ by way of the YA-node, shown in the middle.

2.2 Online Communication and Interaction

2.2.1 Social Media and the Social Web

The social web consists of the people, tools and communities that form over the world wide web, and is a way for individuals to share content, ideas and information. The social web presents a number of challenges for extracting and analysing arguments, particularly due to the lack of clear "indicators" of argument or structure. This problem is compounded by the type of language used; often highly informal, incorporating slang and irregular punctuation and grammar (Schneider et al., 2012). As the social web becomes more and more ubiquitous, the potential for using it to investigate how truly massive communities interact, communicate and argue increases dramatically.

Many theoretical models of argumentation are based on the assumption of a dialectic argument, as their purpose is to aid the participants with the process of understanding the information discussed, or to reason over the model and draw conclusions regarding the outcome. However, in social media there is a clear proliferation of eristic argumentation (Sood et al., 2012). This makes the role of audience an important feature to consider: when an individual responds to a post on the social web their post is often seen not just by the author of the post they reply to, but by many other users as well. In fact, many posts may be directed at this wider audience to seek approval, voice dissent, or provoke other emotions (Berland and Forte, 2010). Consider the analogy of a political hustings: neither candidate believe they can change the mind of their opponent, but instead are debating with a view to sway their audience. Schneider et al. note though, that currently it is difficult to model the value of eristic arguments as participants are

free to *"sling propositions that they would not commit to under other circumstances"* as a means of catharsis, recreation or entertainment (Schneider et al., 2014).

Kaplan and Haenlein (2010) classify six distinct categories of social media: collaborative projects, blogs, content communities, social networking sites, virtual game worlds and virtual social worlds. Collaborative projects allow many different users to create, maintain and often discuss content. This category includes sites such as the online encyclopaedia *Wikipedia*[4], which allow users to write and edit articles and *Urban Dictionary*[5], a user generated dictionary of slang and internet culture. Kaplan and Haenlein compare blogs (web-logs) to personal websites, in that they allow users to post information about the subject of their choice – these posts are often timestamped and presented reverse-chronologically. *Wordpress*[6] and *Blogger*[7] are two social media sites specialised for this purpose. "Micro"-blogging sites that pose limits on the amount of content that can be shared in a single post, such as *Twitter*[8], also fall into this category. Content communities revolve around the concept of publishing (and ultimately sharing) different forms of media. These include sites for publishing video (such as *Vimeo*[9]), images (such as *Flickr*[10]), audio (such as *SoundCloud*[11]) and many other different types of media. Social networking sites allow users to create a profile detailing information about themselves (such as home town, or music preferences) and then connect their profiles with the profiles of others on the site. Examples include *Facebook*[12] and *Google+*[13]. Virtual game worlds (such as *World of Warcraft*[14]) encompass online games in which a user controls a digital avatar to accomplish certain tasks (such as slaying a virtual dragon, or defeating another player's avatar). Similarly, virtual social worlds (such as *Second Life*[15]) encompass virtual spaces in which users have an avatar, but there is no specified aim or end-goal – the medium exists solely to facilitate social interaction. In this work, less focus is afforded to these latter two areas of the social web due to the the issue that as participants are controlling a virtual avatar, and may be playing a particular "role" rather than their real self, this can affect their behaviour and engagement in a discussion Hooi and Cho (2013). There is also the tendency for discussions to centre on the mechanics of the game world itself (Alagoz, 2013).

2.2.2 Anti-Social Behaviour

Anti-social behaviour is a growing problem on the social web, and often arises from debates or discussions that get out of hand (Suler and Phillips, 1998; Davis, 2002; Sood et al., 2012).

[4] https://en.wikipedia.org/
[5] http://urbandictionary.com/
[6] http://wordpress.com/
[7] http://blogger.com
[8] http://twitter.com/
[9] http://vimeo.com/
[10] http://flickr.com/
[11] http://soundcloud.com/
[12] http://facebook.com
[13] http://plus.google.com/
[14] http://battle.net/wow/
[15] http://secondlife.com

This behaviour can arise from simple misunderstandings due to the difficulty in conveying tone through text, or as a deliberate act by individuals lashing out at other participants in a discussion. Incidents include flaming, in which a user simply hurls emotional abuse (Konijn et al., 2008, p. 13); spamming, in which a user floods the medium with content, often unrelated to the topic in hand, in the hope of drowning out other participants or as a means of advertising a commercial product (Krause et al., 2008); trolling, in which a user posts seemingly innocuous but deliberately fallacious argument to provoke other members of the group into becoming outraged (although there is debate as to whether this term refers to the bridge-dwelling monster of myths, or the fishing term for dangling a baited line behind a boat) (Herring et al., 2002); and much more serious incidents of directed threats and stalking (Spitzberg and Hoobler, 2002; Willard, 2007; Jane, 2014).

As a result, there is a concerted research effort into the best way to tackle these issues before they cause serious harm to individuals, or the field as a whole. Suler and Phillips (1998) discuss a wide variety of approaches (specifically in regard to the virtual social world *The Palace*[16], but these could be applied to other online spaces as well). The simplest solution is to moderate users' interactions and dispense warnings, "mutes" (where a user may observe, but not contribute) or, in extreme cases, bans as and when the situation warrants. While effective for dealing with small or close-knit communities, this approach does not scale when considering the social web.

TODO: Arguments against the troll (Torroni et al., 2010)

A different approach is to allow the community a degree of self-moderation. Reputation systems, for example, allow users within a community to assign "votes" to a particular account, or post, to show its trustworthiness. This allows new users to make judgements on whether to take a comment seriously, for example, or to purchase something from a particular seller in an online auction (Resnick et al., 2000; Anderson et al., 2012). However, this can also lead to a feedback loop in which communities become self-reinforcing; if users always vote for posts of similar sentiment (or against those that disagree), then gradually these sentiments will become dominant. Over time only users who hold these views will contribute to the site (further reinforcing the disparity) and the community as a whole will stagnate or worse, become distrustful or outright hostile to new members or "outsiders".

In another example of direct self-moderation, the popular online game *League of Legends*[17] implements a "tribunal" system in which players that are reported for poor behaviour in matches (such as verbally abusing team-mates) are judged by their peers. These peers can examine evidence such as chat logs and game scores, then decided whether to "pardon" or "punish" the offending player (Hodson, 2013; Kou and Nardi, 2013).

A more covert attempt to manipulate users' behaviour can be found in certain implementations of human-computer interaction design. HCI can be leveraged to "trick" users into performing (or not performing) an action desirable to the designer. These so-called "malicious interfaces"

[16] http://thepalace.com
[17] http://leagueoflegends.com

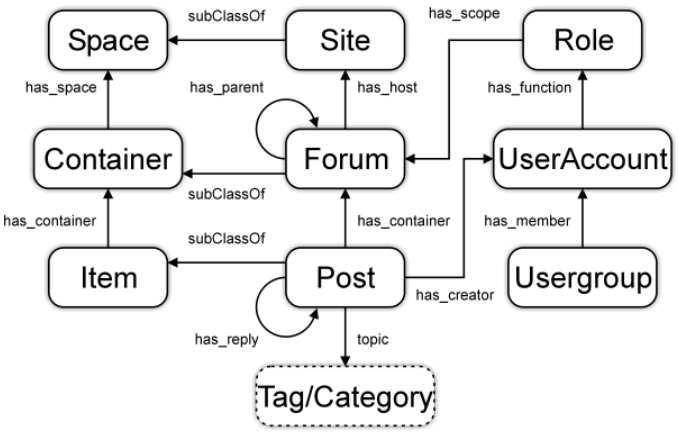


Figure 2.7: An overview of the core SIOC ontology[18]

(Conti and Sobiesk, 2010) are often used to trick users into spending time or money that they otherwise would not (for example, advertising banners that suddenly cover page content). In 2008, YouTube temporarily added an "Audio Preview" button to its comment system that would read aloud what the user intended to post. This was placed in the previous place of the "post" button (which had been moved further to the right), such that a user was likely to unintentionally preview their comment before posting it (Munroe, 2008).

2.2.3 Semantically-Interlinked Online Communities

The Semantically-Interlinked Online Communities project (SIOC) aims to enable the cross-platform, cross-service representation of data from the social web (Breslin et al., 2006). SIOC allows for semantic representations of Sites, which hold Forums, which contain Posts, authored by the owner of a UserAcount. This structure is shown in Figure 2.7. SIOC is often used in conjunction with the Friend of a Friend (FOAF) ontology, to show how individuals map to their online personas.

While an extension to SIOC, for the purposes of capturing and representing argumentation, does exist (Lange et al., 2008), it is based on the Issue Based Information System (IBIS) principals of modelling an argument as an issue that needs to be solved, with users suggesting ideas, then providing arguments for or arguments against these ideas. While this approach is highly useful when dealing with arguments centred around deliberation, and to a lesser extend criticism or inquiry, they are not as suitable when modelling negotiations or eristic arguments.

2.3 Social Aspects of Argumentation

TODO: ReasonWell, etc.

[18] http://sioc-project.org/ontology

TODO: Prescriptive vs. Descriptive etc.

2.4 Summary

TODO: Summarise

Chapter 3

Preliminary Investigation into Modelling with the AIF

To determine how capable current tools and frameworks are for capturing social argumentation, and the nuances between dialectic and eristic argumentation, a preliminary investigation was conducted. This aimed, firstly, to show how these tools and frameworks can be combined in a way that makes them fit for this particular purpose and, secondly, to determine the key strengths and weaknesses of this combination in relation to modelling social argumentation.

3.1 Approach

The AIF was determined to be the closest fit for purpose ontology for modelling argumentation on the social web, due to the goals of capturing practical, language-based argumentation, with the additional benefit of being readily extensible. Alongside the SIOC, the key elements of these ontologies have been combined to explicitly capture the social component of argumentation on the social web, while also modelling the formalised argument structure. This is achieved by linking the concept of a SIOC Post with that of an AIF Locution, treating a social web thread as a separate dialogue, or argument$_2$ and each post as an atomic unit within the dialogue (containing zero or more individual arguments$_1$). In the majority of cases, a single locution will translate to a single self-contained argument$_1$. However, a single post can contain a number of arguments$_1$ – each with a number of premises and a single conclusion. In this situation a single L-node will link to multiple YA-nodes, as shown in Figure 3.1. In rare cases (often caused by constraints imposed on the length of a post by the service, such as the 140 character limit on Twitter), a user will spread the premises of a single argument across multiple posts to construct their argument$_1$. Figure 3.2 shows how, in such a situation, multiple L-nodes will link to a single YA-node. If two users post identical statements, they still contribute two distinct locutions. However, they will both be linked to the same I-node(s), and therefore the same argument$_1$. In this situation, multiple YA-nodes may point to the same I-node, such as in Figure 3.3.

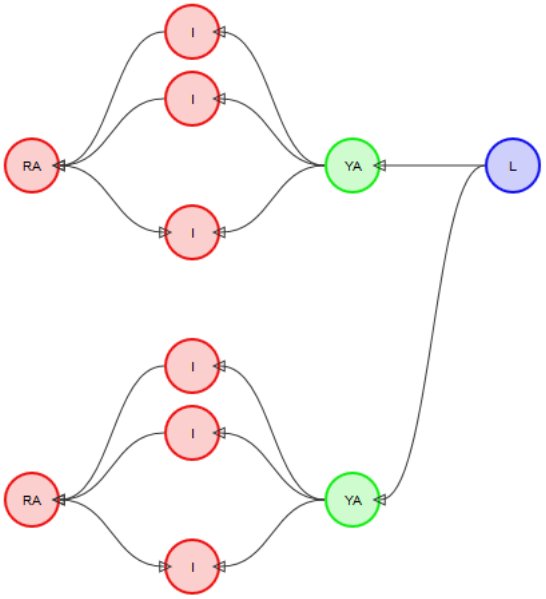


Figure 3.1: Visualisation of one post making two distinct arguments[1]

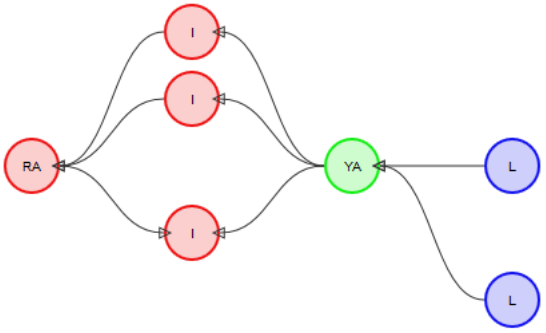


Figure 3.2: Visualisation of two posts, used to construct a single argument[1]

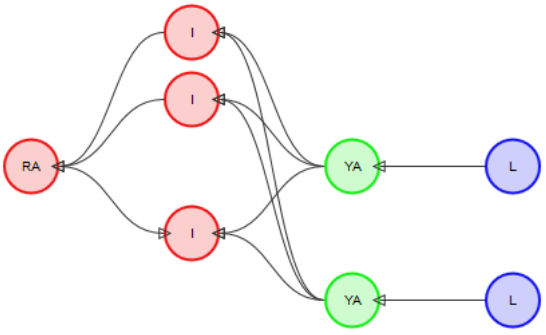


Figure 3.3: Visualisation of two posts, repeating the same argument[1]

3.2 Methodology

3.2.1 Data Collection

A single topic of argumentation was chosen to be examined for three case studies, each representing a different social media system. To ensure the stimulation of debate, the selected topic needed to be controversial, have a large number of respondents and have been active for a long enough period of time to generate a rich and complete content. The October 2013 United States government shutdown caused by Congress's failure to agree on a budget, and the following condemnation this received from the presidency, was a suitable match for these requirements.

This topic was then tracked across three of the social media categories identified by Kaplan and Haenlein (2010): Twitter, a microblogging service that allows users to publish messages of up to one-hundred and forty characters; Facebook, a social network, that allows users to create a network of "friends" and share text or images; and YouTube, a content creation site where users can create and upload videos, or playlists of videos.

The source of the posts themselves again needed to be both publicly available and have a large number of followers to ensure a maximally stimulated debate. As an authoritative public figure at the heart of the crisis, content from or relating to Barack Obama's social media profiles was chosen, and three posts that were broadly similar in content were selected for study. The first post, initially posted on 8th October 2013 from the White House's YouTube channel[1], is a 14m 40s video recording of Obama delivering a statement to press from the West Wing of the White House, condemning the shutdown. The post taken from Obama's official Twitter account[2] (which is managed by a third party, Organizing for Action), dated 15th October 2013, reads: *"This is unacceptable. Tell Tea Party Republicans to stop holding our economy hostage: http://OFA.BO/qNmA3Y"*. The included hyperlink leads to an Organising for Action page, which encourages users to to voice their displeasure at the shutdown by allowing them to automatically generate and send tweets. The post taken from Obama's official Facebook account[3] (also managed by Organizing for Action), also dated 15th October 2013, reads: *"Tea Party Republicans in the House of Representatives forced a government shutdown, and now they're threatening an economic shutdown. This has gone on for too long. Tell them to #EndThisNow: http://OFA.BO/ACC7qB"*.

The discussions surrounding these posts were acquired by collecting comments replying to each initial post, and those replying to subsequent posts in the discussion (taking into account only direct replies, rather than mentions within the text of the post), with the use of the public Twitter, Facebook and Youtube APIs respectively. This data was translated to an RDF triple-store using SIOC to record the data specific to the social media platform, such as which User created which

[1] https://www.youtube.com/watch?v=7LwoudGfug0
[2] https://twitter.com/BarackObama/status/390288744235823104
[3] https://www.facebook.com/photo.php?fbid=10151874920756749

Table 3.1: Metrics of total dataset collected from YouTube, Twitter and Facebook

Metric	YouTube	Twitter	Facebook
Total number of posts	2719	137	9494
Total number of users	1255	33	6224
Average posts per user	2.17	4.15	1.53
Average words per post	26.74	15.91	40.12
Average characters per post	150.13	97.63	241.14
Time between first and last posts	101d 16h 19m 12s	0d 13h 40m 48s	90d 19h 55m 12s
Average time between posts	53m 52s	3m 02s	13m 47s

Post and which Thread stores which Posts. This was used in conjunction with the DCTerms ontology, which held supplementary data such as timestamps.

3.2.2 Data Sampling and Annotation

Because of the volume of the data produced over the course of the tracked event and the time-intensive nature of manually annotating the data, it was necessary to sample the data to a more manageable size before annotation could take place. To prevent information being lost when the dataset was scaled down, it was important to ensure that the sampled graph maintained properties (such as diameter and average path length) similar to those of the raw data. To maintain these characteristics, "forest fire" sampling (Leskovec et al., 2005; Leskovec and Faloutsos, 2006) was used to create a sub-graph that preserved the overall structure of the parent. The algorithm for forest fire sampling is as follows:

1. Choose a "forward burning probability" p – in this instance a value of 0.7 was chosen based on the recommendation by Leskovec and Faloutsos (2006) for scaling down a larger graph
2. Choose a random starting node
3. Add this node to the sample graph. Select x nodes at random from all nodes linked to the chosen node, where x is a random number geometrically distributed with mean $\frac{p}{1-p}$. If the selected node has fewer than x linked nodes, select all available nodes, and return to step 2.
4. With each selected node, recursively repeat step 3 until the desired sample size has been reached.

Thirty posts from within the following discussion (i.e. not including the original posts) were selected using this method. This data was then manually annotated with the formal argument$_1$ information. Specifically, from each L-node, both explicit and implicit I-nodes were extracted and related together using the most appropriate S-nodes.

Table 3.2: Metrics of discussions sampled from YouTube, Twitter and Facebook

Metric	**YouTube**	**Twitter**	**Facebook**	**All**
Total number of posts	30	30	30	90
Total number of users	23	12	30	65
Average posts per user	1.30	2.50	1.00	1.38
Average words per post	26.77	16.33	42.10	33.18
Average characters per post	147.90	101.20	259.67	201.70
Time between first and last posts	4d 0h 54m 56s	0d 5h 13m 33s	3d 12h 13m 18s	n/a
Average time between posts	3h 20m 31s	0h 10m 49s	2h 54m 15s	0h 17m 10s

Table 3.3: Aspects of raw data from social media APIs capable of being modelled using the AIF or SIOC ontologies

Features present in social media APIs	**Represented in:**	
	AIF	**SIOC**
Locution (explicit content)	✓	✓
Illocution (premises/conclusions)	✓	
Argumentation structure (attacks/support)	✓	
Author	✓	✓
Avatar		✓
Replies	✓	✓
Creation Date	✓	✓
Reputation (e.g. "Likes")		
Location		
User "Type" (i.e. individual/business/etc.)		
Sentiment (implicit content)		

3.3 Results and Analysis

An overview of the raw data collected from each platform is shown in Table 3.1 and the sampled data in Table 3.2. In total, the discussion generated by the Twitter post has slightly over one-hundred and thirty replies – in contrast, the YouTube comments total nearly three thousand posts, and the Facebook discussion has well over nine-thousand. Each platform sees the vast majority of posts contributed soon after the initial post. However, each has a "long tail" of responses that gradually decrease in frequency as time goes on. The discussion on Twitter seems particularly ephemeral, with participants only contributing for a short time before moving onto other topics; while the Facebook and YouTube posts appear more "permanent", with users finding and contributing to them months later.

In addition, when collecting this data it became apparent there was information that had no appropriate representation in either ontology, such as reputation systems (for example, the "Likes" used by Facebook), the sentiment of the post (for example, sarcasm, humour, abuse) or information about the type of user making the remark (whether they are an individual, a celebrity, a corporation, etc.); these omissions are shown in Table 3.3. These features could have substantial bearing on the perception of the argument$_2$. Consider the example of reputation systems: a retort stating *"You're an idiot"* may be perceived very differently by the audience if it has no

Table 3.4: Summary of AIF nodes found in annotated discussions collected from YouTube, Twitter and Facebook

Metric	YouTube	Twitter	Facebook	Total
L-nodes	30	30	30	90
TA-nodes	0	20	0	20
YA-nodes	31	30	41	102
I-nodes	88	116	110	314
S-nodes	13	30	26	69
L- to I-node ratio	15:44	8:29	3:11	45:157

up-votes, one up-vote or one hundred thousand up-votes. Alternatively, consider a user making the argument$_1$ that *"I really love using this product"*: whether the statement is made by an individual, or the company selling the product would likely influence the validity and value of the statement.

Table 3.4 shows the statistics collected after annotating the data with premises and conclusions, represented as AIF nodes. Given this data it can be seen that Twitter is the only sample that contains Transition-nodes; that is, replies to other posts within the thread. While this may appear to suggest that the platform is used more fore debate than the others, it is possible this is down to deficiencies in the APIs of the other platforms, which often do not accurately highlight replies. It can also be observed that the debates on Twitter and Facebook have a much higher information content than that of YouTube. The resulting structures are visualised in Figure 3.4, which shows a side-by-side comparison of the three different samples.

On the surface, the sample of posts taken from Twitter and Facebook appear to have similar information content. However, upon manual inspection, it can be seen that this average is actually heavily skewed by one particular Facebook post that is thirteen paragraphs long and contains a total of twenty six information nodes. The argument in question is reproduced on a number of different websites, and is likely reused in full as a boilerplate "cut and paste" rebuttal by many users when engaging in an argument on that topic.

To highlight the overall information disparity take, for example, the tweet *"@BarackObama Stop expanding government, spying on Americans and driving up the deficit."*. This is an enthymeme – the literally derived I-node acts as a conclusion, while the premises (that Obama is expanding government, spying on Americans and driving up the deficit and that to do so is a bad thing) are left implicit. In turn, contrast with the posts *"first"*, *"wow obama"* and *"lolollll i love this"* which contain very little information, either explicit or implicit. In addition, not all posts with a large amount of literal content have a comparatively large amount of information. For example, posts such as *"Give DIRETIDE Give DIRETIDE Give DIRETIDE..."* (repeated upwards of fifty times in a single post) show a desire to derail the discussion by flooding it with completely irrelevant information ("Diretide" refers to a cancelled seasonal event in the popular online game *Defence of the Ancients 2*; the cancellation sparking uproar from the fanbase which led to a number of social media platforms being flooded with this message).

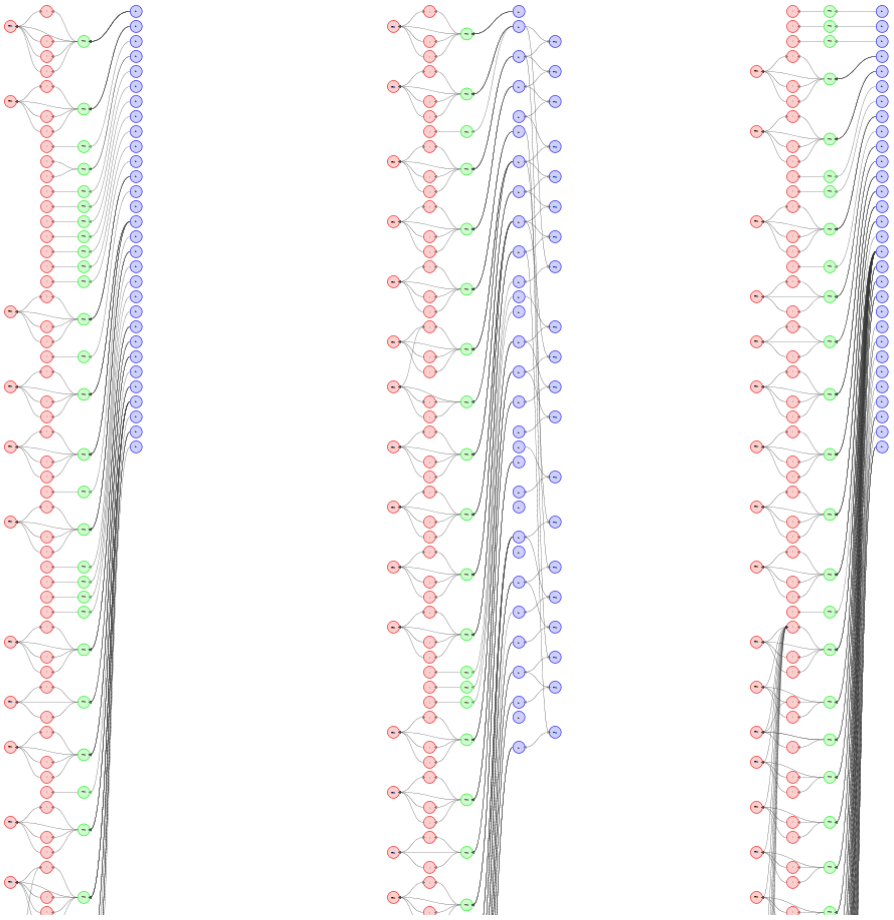


Figure 3.4: A side-by-side comparison of the emergent structures of discussions taken from YouTube (left), Twitter (centre) and Facebook (right)

In addition, there are other posts that have deeper contextual meaning that would first appear. Consider, for example, "RedScareBot"[4]: this is an automated Twitter account that, using the avatar of Joseph McCarthy (an American politician famous for making claims at the height of the Cold War that their were numerous Soviet agents in the US government), replies to any tweet that includes phrases such as "communism" or "commie" with quips such as *"Commie Chameleon"*, *"Oh noes, Socialism"* or *"Rise of the USSA"*. While this may seem nonsensical or a non-sequitur without context, *with* context it can be viewed by the audience as a derisive or satirical retort to a knee-jerk insult, despite being posted by a machine.

There are of course limitations on the conclusions that can be drawn from a relatively small dataset when working with proverbial "big data". As such, these findings cannot be used to justify broad claims that state that *all* arguments on a particular example of social media are structured in this way. These examples instead serve to demonstrate the important fact that different types of structures *can* evolve, and provide some examples of the argumentative and rhetorical tactics people use when arguing over social media and how the conjunction of the

[4]https://twitter.com/RedScareBot

AIF and SIOC projects (as well as any extensions made to these) can be used in attempts to map them.

3.4 Summary

TODO: Summary TODO: This shows that, currently, it is insufficient to use the AIF (and its extension) to fully model eristic argumentation, even when certain social aspects are modelled through other ontologies such as SIOC.

Chapter 4

The Argumentation on the Social Web Ontology

In the preliminary investigation, the capability of existing frameworks and their use in capturing and modelling argumentation and social communities was examined and evaluated (Blount et al., 2014). It became apparent that the AIF, while a powerful tool for modelling (dialectic) argument, lacked the ability to capture the eristic aspects of social argumentation. While some logical fallacies, such as the *ad hominem* attack can be suitably modelled within the AIF, the rhetorical force of "simple" abuse is difficult to capture.

However, there is reason to suggest that while such abuse (for example) may not be valuable to the argument$_2$ itself, that does not mean it is not valuable to model such outbursts. A heckler in a debate, for example, may not have any well-reasoned argument$_1$ to hand and resort to throwing vulgarities, but by simply disrupting the proceedings they are voicing their dissent at the positions offered. This is reason enough not to discard the contribution; however, it can also act to catalyse further argumentation on the subject between the main participants. Likewise, a participant in a debate may, instead of putting forth their own argument or attacking their opponent's, make some sort of joke to endear themselves to the audience. While the AIF can model the locution, the rhetorical force behind it goes uncaptured.

In addition, there are other socio-rhetorical tactics that are often employed on social media. These include spamming (posting large volumes of a repetitive nature) to drown out other posters, deliberate deviation from the topic at hand, bringing up non-sequiturs in an attempt to derail the argument and "meta-argumentation" – criticising the way in which an opponent argues, but not the argument itself (e.g. if a user claims another is breaking the rules of the forum, or of not arguing in good faith). There are also the non-textual features of social media to consider; that is, the feature of posts other than their content. For example, the number of "Likes" or "Favourites" a post has, demonstrates popular (or audience) support for this opinion or position.

4.1 Initial Proposals

TODO: Discuss different proposals, pros and cons, why settled on final choice

The principal focus here is the inclusion of rhetorical support and attack. While these features are only one aspect of rhetorical argument, they feature heavily in eristic dialogue (particularly rhetorical attacks), showcase both the positive and negative aspects of rhetorical argument and are important due to the impact they can have within discussions on the social web and the culture surrounding it (Blount et al., 2015a).

Rhetorical support is often relatively benign. It can be used to show solidarity with other members of the dialogue, to incorporate oneself into a social group, or to encourage . Consider the extracts *"bro fist bump"*, a short declaration of support for another user, and *"I commend you for admitting that debt & deficits are important...If only more [people] felt the way you do"*, which disagrees with the overall stance presented by their opponent, but commends them for conceding some common ground, in attempt to further dialectic argument.

Conversely, rhetorical attacks are often extremely hostile. They differ from logical attacks by attacking the person behind the argument rather than the argument itself (this is not to be confused with an *ad hominem* argument which attacks a person's argument by calling their character or credentials into question – these are logical, even though they are fallacious). Rhetorical attacks often contain extremely vulgar language. The purpose of these statements can be interpreted in a number of ways, from showing the audience how impassioned and emotive the rhetor is on the subject, to cathartically blowing off steam, to intentionally silencing dissenting voices with threats.

Figure 4.1 shows the simplest approach, similar to the current way the AIF models the use of *ad hominem* attacks, by linking the attack to the opponent's argument$_1$ with a CA-node. However, this is insufficient for the majority of abusive attacks; while *ad hominem* tactics attack an opponent's argument$_1$ by claiming they are not qualified, or otherwise unfit, to make such an argument$_1$, abuse often does not attack their position at all, but seeks to undermine them emotionally in front of their peers.

This mapping can be modelled by linking the content of the locution to the targeted user's account as shown in Figure 4.2. However, a UserAccount can be involved in any number of topics, and be attacked for any number of reasons. Furthermore, a person can choose to present themselves as a dramatically different person (having different credentials, skills, opinions or even race, religion or gender) when they are on the web as opposed to off. They may even choose to represent themselves differently between individual threads and discussions. To this end, another type of node is needed to represent the abstract notion of the "persona" a user presents.

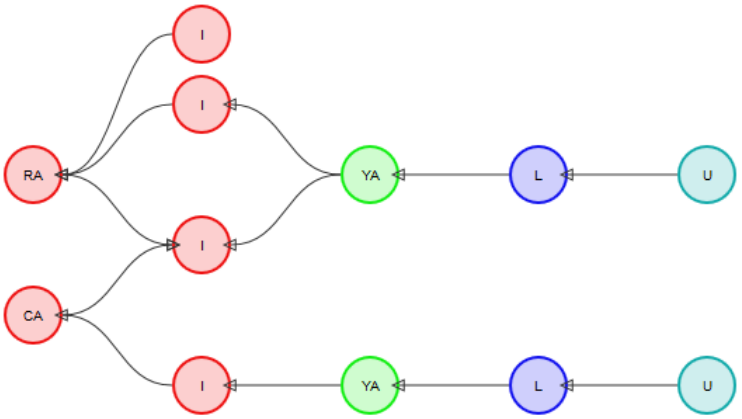


Figure 4.1: Proposal for representing abusive attacks as solely within the argument$_1$ structure

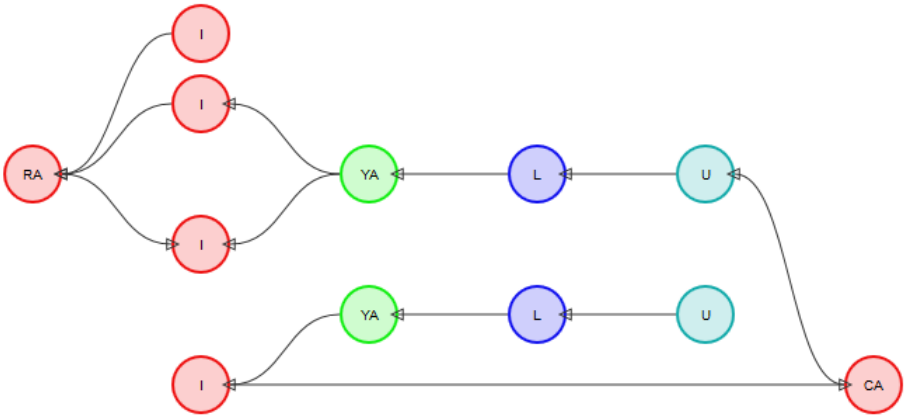


Figure 4.2: Proposal for representing abusive attacks as connected with the social aspect of the argument$_2$, attacking the author directly

This is illustrated by Figure 4.3. Introducing the idea of personas allows each UserAccount to present a different view of themselves (that can be supported or attacked accordingly) when engaging in multiple discussions or topics.

Figure 4.4 TODO: Shows persona nodes

Here, the key additions is the Persona node – this represents "character" that they assume during the discussion. A person may argue in a different fashion in a debate about music than they would about technical expertise, for example. This allows one UserAccount to have many Personas where necessary. The inverse, linking one Persona to multiple UserAccounts, is also possible, and could represent a participant attempting to artificially solidify their position by creating multiple accounts.

TODO: while out of scope for this body of work, the topic of modelling social systems was also considered (Blount et al., 2014). These proposals included suggestions for modelling social web specific features, such as the use of reputation systems (e.g. Likes or up/down-votes). Reputation

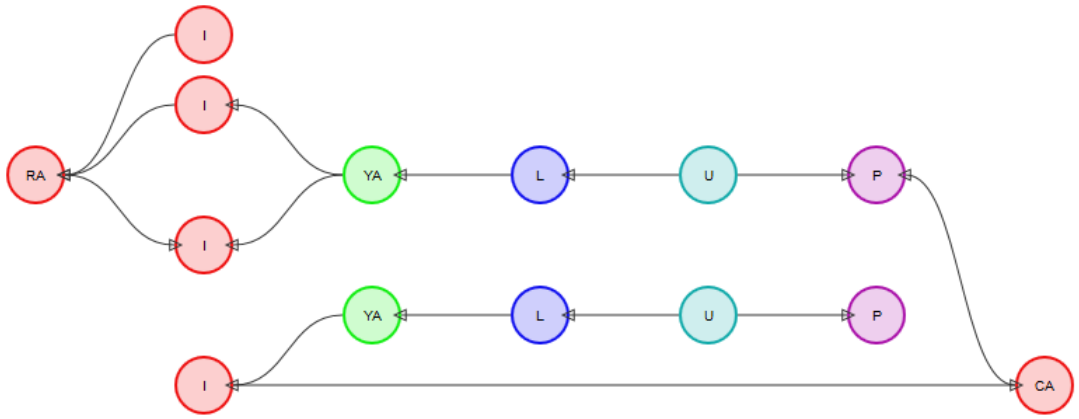


Figure 4.3: Proposal for representing abusive attacks, extending that shown in Figure 4.2 with the addition of Persona nodes

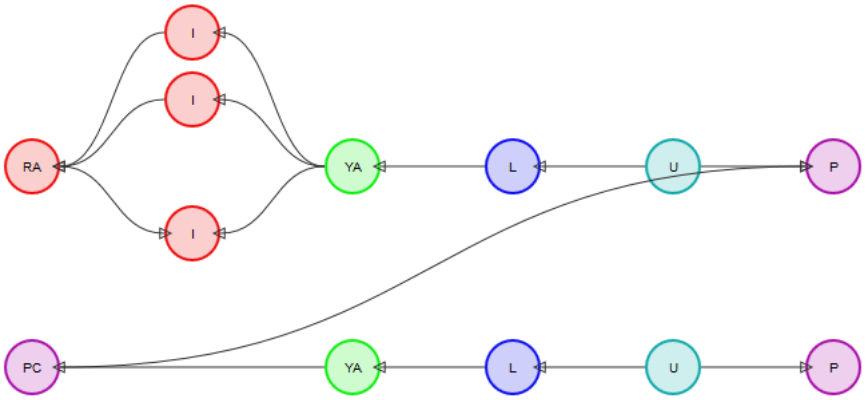


Figure 4.4: Proposal for representing abusive attacks, extending that shown in Figure 4.3 with the addition of Personal Conflict node

systems make up a key aspect of non-verbal argumentation on the social web, allowing users to show agreement or disagreement to a position, sometimes anonymously, without the need to articulate their own position.

Figure 4.5 shows one such approach; namely, modelling each vote as a separate Locution, linking to an I-node that either (logically) supports or attacks the voted-on post.

Alternatively, Figure 4.6 shows an approach which aggregates this information into a single Reputation node. This has the advantage of keeping to social information distinct from the logical graph structure, but the disadvantage of omitting how much each UserAccount contributed to the reputation.

The ASWO does model these reputation systems; however, for simplicity, they are not modelled as nodes in the graph structure, but are included as literal values attached to the relevant Locution.

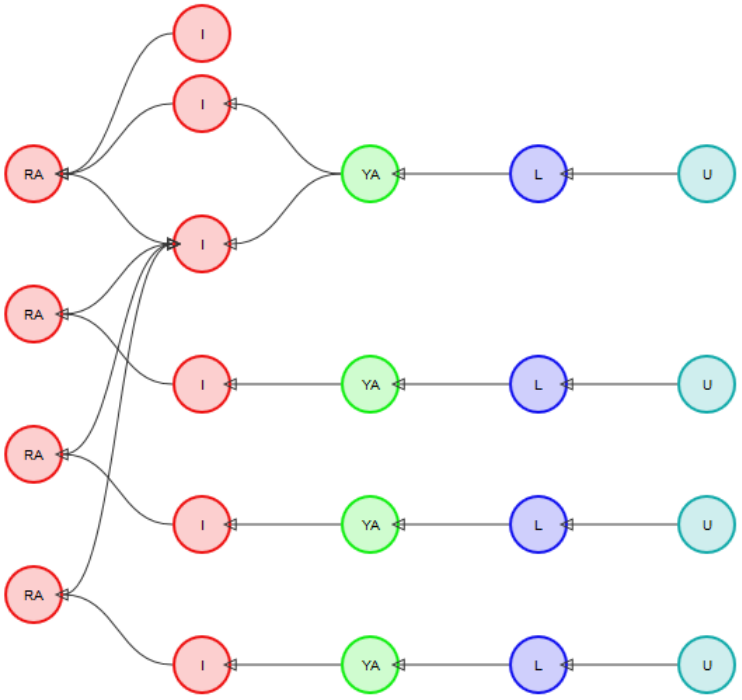


Figure 4.5: Proposal for representing reputation systems by modelling up- and down-votes as individual Locutions

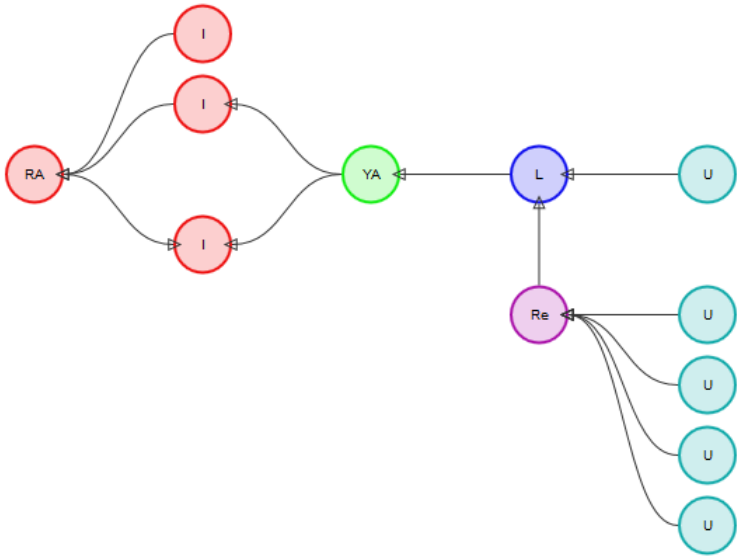


Figure 4.6: Proposal for representing reputation systems with the introduction of a Reputation node

In addition, because the SIOC ontology also accounts for replies to and from a post, the use of AIF TA-nodes has also been refined in relation to the social web. They now no longer need to be used whenever an L-node directly responds to another; instead they can be used solely to refer to "transitions" in the argument. These transitions are used when a Locution contributes to the argument$_2$ without providing any information, but instead helps move the discussion to the "next stage", usually by asking questions or prompting further debate. Note that these transitions don't necessarily move the discussion forwards, but can also be used to take the argument$_2$ around in circles by asking questions in bad faith (or *sealioning*).

TODO: TIE THESE BITS TOGETHER

4.2 Investigation

The ASWO, and the augmentations made to the AIF and SIOC ontologies, were trialled in an investigation to study the application of logical versus rhetorical techniques in eristic dialogue on the social web. As before, this investigation focused on three different areas of the social web, but used a much larger sample size than previously: in total, two hundred and seventy posts were collected and annotated. These were used to analyse the proportion of rhetorical contributions throughout the argument$_2$, analyse the relation between logical and rhetorical arguments$_1$ used, and compare the features of the annotation structure with the content of each post.

4.2.1 Methodology

4.2.1.1 Data Collection

During the course of this work, the Google YouTube API v2.0 was deprecated before the API v3.0 fully supported the retrieval of explicit replies to comments. Due to the importance of the ability to capture replies, the decision was made to use an alternative medium in this case study. To this end, YouTube was replaced with the social news and networking site Reddit. Reddit has a variety of topic-specific boards or "subreddits" that allow users to post to a collaborative pool of information; posts can then be up-voted or down-voted to show interest and/or accuracy.

Obama's official account on Reddit was inactive over the period of the shutdown; however, another user (unaffiliated in any official capacity with Obama) posted a link to Obama's official website (managed by Organizing for Action) to Reddit's politics subreddit[1] on 15th October 2013 (the same date as the official posts to Twitter and Facebook). The post reads *"Tea Party Republicans in the House of Representatives have already shut down the government because they couldn't derail Obamacare. Now they're threatening to cause an economic shutdown"*. This thread was used alongside the previously acquired threads from Twitter and Facebook

[1] http://reddit.com/r/politics/1oij25

Table 4.1: Metrics of discussions sampled from Twitter, Facebook and Reddit

Metric	**Twitter**	**Facebook**	**Reddit**	**Total**
Posts	90	90	90	270
Direct replies	77	0	67	144
Number of users	26	85	43	154
Average posts per user	3.5	1.1	2.1	1.8
Average words per post	15.83	41.36	42.34	33.18
Average characters per post	96.51	265.27	243.31	201.70
Time between first and last posts	0d 6h 53m 40s	3d 4h 51m 27s	3d 0h 50m 12s	n/a
Average time between posts	04m 39s	51m 49s	49m 06s	35m 11s

described in Section 3.2.1. Each UserAccount involved in the three threads was automatically designated a single Persona, as only one topic was monitored. This could be expanded if the same UserAccount took part in multiple threads on multiple topics, for example.

As with the preliminary work, forest fire sampling of the graphs was undertaken to provide a representative sample of the arguments that was feasible to annotate manually. For this investigation a larger sample size of ninety posts was used from within each discussion. Table 4.1 shows an overview of the sample structures and some key characteristics of each thread.

4.2.1.2 Annotation

With the changes to the ontologies in use (such as the decision regarding TA-nodes discussed in Section 4.1), and a larger amount of data needing to be annotated, the annotation method itself needed to be properly formalised to solidify reproducibility and minimise subjectiveness. Posts are annotated according to the scheme below.

Each post is considered to contain zero or more separate arguments$_1$. A YA-node is created for each argument$_1$ made in a single post, and links the L-node to each I-node in the argument$_1$. Repeated information does not create a new I-node; instead the YA-node links to the I-node already present. All participants are assumed to have some implicit knowledge about the world in general and the topic at hand. This is to avoid the inclusions of trivial I-nodes that state information such as *"Barack Obama is president of the United States"*, or even *"Barack Obama is a human being"*. Any information explicitly contained in a post that is deemed to be not in this set and relevant to the discussion at hand was included as an I-node. Information that meets one (or more) of the following criteria is not considered relevant:

- Off topic: posts that do not relate to the topic being discussed are not considered relevant. Example: *"Ataturk did revolution ! building moderate muslim network is oxymoron which has been destroy secular , democratic, rule of law in Turkey."*
- Conversational: similar to off-topic posts, those that are conversational in nature are not annotated as information-containing. Example: *"I thank you, have a good night!"*

Table 4.2: Summary of AIF and ASWO nodes found in annotated discussions collected from Twitter, Facebook and Reddit

Metric	Twitter	Facebook	Reddit	Total
L-nodes	90	90	90	270
TA-nodes	52	9	15	76
YA-nodes	58	74	70	202
I-nodes	56	98	86	240
RA-nodes	13	20	24	57
CA-nodes	18	1	34	53
PA-nodes	4	4	2	10
PS-nodes	2	2	3	7
PC-nodes	26	6	12	44
L- to I-node Ratio	45:28	45:49	45:43	9:8

- Meta-argumentation: while argumentation about how to argue "properly" is an interesting construct in itself, and an important aspect of rhetorical and eristic argumentation, but was out of scope for this particular study. Example: *"Down voting = disagree Upvoting = agree" "The rules say explicitly not to do that....."*

A TA-node is created to link two Locutions whenever a transition is present in the argument$_2$ – a step that contributes to the overall structure without providing any information (new or repeated). This is most often in the form of an interrogative (for example, asking for further information or evidence for claims). Support and attack between different I-nodes is denoted as described above: logical support through the use of RA-nodes, attack through the use of CA-nodes and preference with PA-nodes, while rhetorical support and attack utilises the new PS- and PC-nodes.

Some nodes in the graph may not be complete as a result of the nature of sampling the graph. For example, it may be possible to detect that a user attacks another user's persona, but not exactly which user they are attacking. Table 4.2 shows an overview of the number of AIF and ASWO nodes added during the annotation process.

4.2.2 Results and Analysis

4.2.2.1 Argumentation Tactics Over Time

Firstly, the way in which the argumentation structure changes and grows over time is presented, in both a logical and rhetorical capacity, by graphing how the number of logical support and attack nodes (i.e. RA- and CA-nodes) and rhetorical support and attack nodes (i.e. PS- and PC-nodes) changes with each post contributed to the argument$_2$. Logical contributions are displayed above the x-axis, and rhetorical contributions below. It must be emphasised that values below the x-axis of each graph should *not* be considered as inherently negative, hostile or anti-social; they simply differentiate between the two types of content.

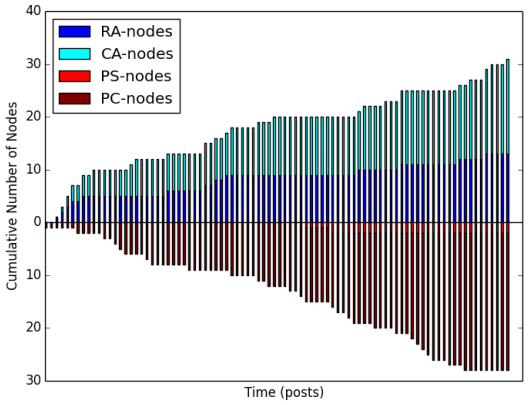


Figure 4.7: Cumulative use of logical and rhetoric tactics over time on Twitter

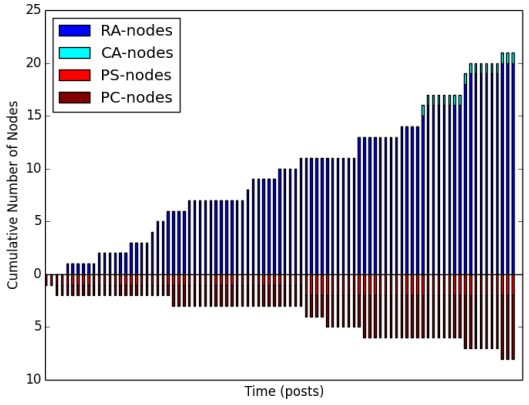


Figure 4.8: Cumulative use of logical and rhetoric tactics over time on Facebook

Figures 4.8 and 4.9 show that use of rhetorical tactics in the Facebook and Reddit case studies rise slowly compared to the use of logical tactics. However, Figure 4.7 shows that in the Twitter case study, the rhetorical contributions rise in parallel to the logical contributions.

In both samples from Twitter and Reddit, the distribution of logical supports and attacks also remain approximately equal. Due to the tendency of RA-nodes to be used for logical support within an argument$_1$, and the tendency of CA-nodes to be used between arguments$_1$, this highlights a greater engagement between participants within these debates than the Facebook sample, which has only one CA-node and comparatively much fewer instances of logical or rhetorical contribution overall. In all three examples however, rhetorical conflict far outweighs rhetorical support.

Overall, it appears that there is no sudden shift in tactics from arguing logically to adopting a rhetorical approach – rhetorical argument forms an underlying and consistent strategy throughout the argument$_2$.

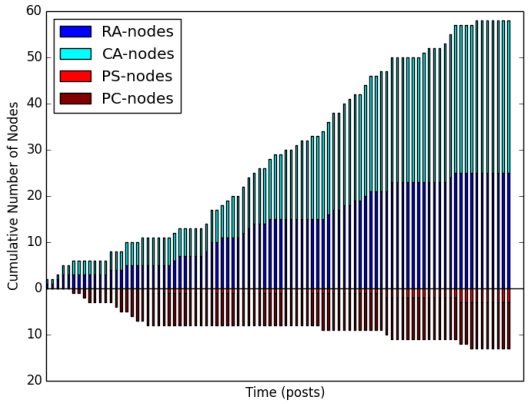


Figure 4.9: Cumulative use of logical and rhetoric tactics over time on Reddit

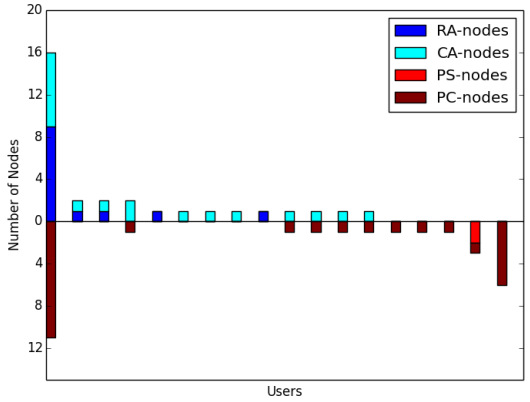


Figure 4.10: Logical and rhetorical contributions per sampled user on Twitter

4.2.2.2 Argumentation Tactics per User

In addition, proportion of logical versus rhetorical contributions made by each user is examined. These graphs show the contributions made by each user (ordered by total contributions overall). Once more, it must bed stressed that values below the x-axis should not considered anti-social solely due to their rhetorical nature.

Figures 4.10 and 4.12 show that users in the Twitter and Reddit samples made more individual contributions to the argumentation structure than those in the Facebook sample, shown in Figure 4.11. This, along with the data in Table 4.1, also supports the suggestion that there is more engagement in these communities than in the Facebook sample.

All samples also display a tendency for rhetorical contributions to be distributed across the scale, with (weak) grouping towards either end. This implies that the users most likely to employ rhetorical techniques are those that contribute the most posts to the discussion overall, and those that make no logical contributions at all.

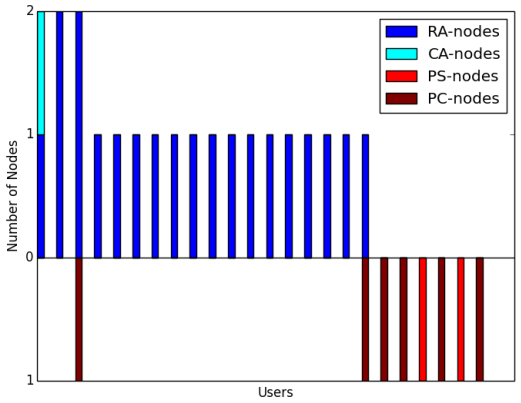


Figure 4.11: Logical and rhetorical contributions per sampled user on Facebook

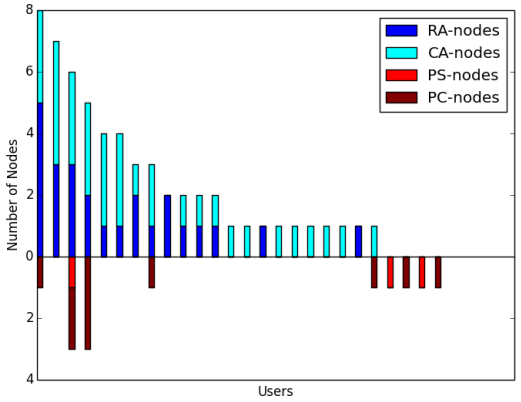


Figure 4.12: Logical and rhetorical contributions per sampled user on Reddit

4.2.2.3 Correlation Between Argumentation Structure and Post Features

Correlations were drawn between the structure of the annotated argument graph, including elements such as the number of logical or rhetorical supports or conflicts and replies to and from each post, and features of the post content and structure, such as post length, number of expletives, percentage of spelling errors and again, replies to and from the post. Replies in particular were viewed from both sides: that is, to analyse whether certain types of posts were more likely to be made in reply, or whether posts that were made in reply tended to contribute similar argumentation structures.

Due to the largely discrete (and often binary) nature of the features and values studied (the majority of posts, for example, are likely to contain either zero or one logical or rhetorical conflict) the correlations are relatively weak, as show in Figure 4.13. However, some notable correlations are presented in Table 4.3. These show potential early indicators of the structure and value of an argument. For example, as might be expected, longer posts are more likely to have greater contributions to the discussion. Posts that use a large number of expletives are likewise

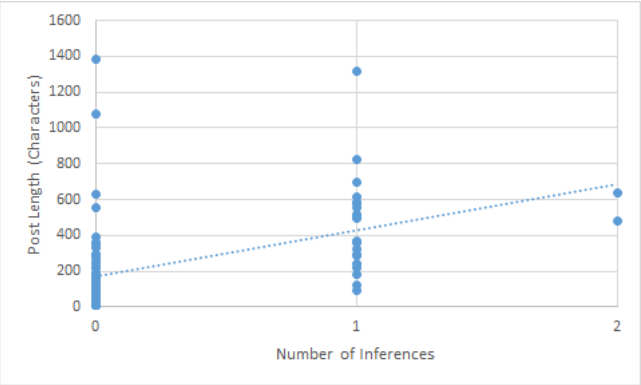


Figure 4.13: Post length correlated against number of logical inferences, on Reddit

more likely to contain a rhetorical attack. When examining all three case studies together, posts made in reply correlated with posts that were replied to, implying that when one or more users engage in a discussion, they are more likely to be engaged with in return.

4.3 Further Proposals

TODO: Following on from the investigations in Section 4.2, further

Table 4.4 shows the total set of additional nodes proposed, to further aid modelling rhetorical argument with the ASWO.

Faction and Audience nodes represent groups of Personas; a Faction is any grouping of Personas and can potentially include those outside the Thread. The Audience represents all Personas currently participating in, or observing, the discussion.

Personal Support and Personal Conflict nodes allow a means of representing support and attack that does not rely on logic and instead uses rhetorical force, social pressure or some other form of "extra-logical" tactic.

Implication nodes allow analysts to represent a participant implying a relationship between two (or more) nodes, such as Personas. These can be combined with the Personal Support/Conflict nodes to indicate whether the implication is positive or negative.

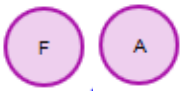
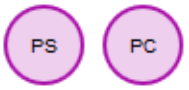
4.3.1 Examples of Use

These additions aim to provide atomic "building-blocks" that can be reused to model a wide range of social, rhetorical and "extra-logical" aspects of argumentation. Here, we show how these nodes can be used by modelling some examples of common logical fallacies.

Table 4.3: Notable correlations between structural argumentation annotations and post features

Case Study	**Argumentation Structure**	**Post Feature**	**Pearson's Correlation (3 d.p.)**	**p-value (3 d.p.)**
Twitter	Personal attacks	Number of replies to this post	0.325	0.002
Twitter	Personal attacks	Percentage of spelling errors	0.301	0.004
Twitter	Personal attacks	Expletives	0.462	0.000
Facebook	Original premises	Reputation ("Likes")	0.332	0.001
Facebook	Original conclusions	Reputation ("Likes")	0.329	0.002
Facebook	Logical inferences	Reputation ("Likes")	0.343	0.001
Facebook	Logical conflicts	Emoticons	0.500	0.000
Facebook	Logical conflicts	Expletives	0.397	0.000
Reddit	Original premises	Post length	0.335	0.001
Reddit	Original conclusions	Post length	0.333	0.001
Reddit	Logical inferences	Post length	0.476	0.000
Reddit	Logical conflicts	Number of posts replied to	0.435	0.000
Overall	Number of replies to this post	Number of posts replied to	0.417	0.000

Table 4.4: Description of nodes added to the model

Name	Description	Node
P-node	**Persona** nodes denote a person's social "character" that they assume during a discussion	
F- and A-nodes	**Faction** and **Audience** nodes represent groups of personas	
PS-, PC-nodes	**Personal Support** and **Personal Conflict** nodes support/attack (individual or groups of) **Personas** and **Information** in a non-logical way	
Im-node	**Implication** nodes indicate a relationship that the participants can not be sure exists	

4.3.1.1 Syllogism

A syllogism is an example of reasoning in which two premises are used to draw a conclusion. Figure 4.14 shows a syllogism of the form *"All men are mortal. Socrates is a man. Therefore Socrates is mortal"*.

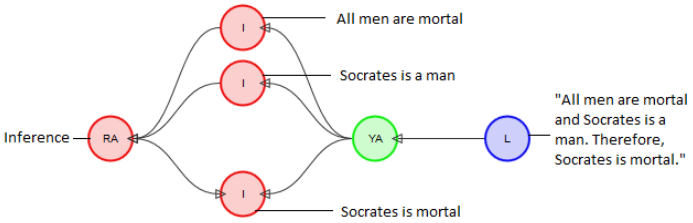


Figure 4.14: Example of a syllogism: *"All men are mortal. Socrates is a man. Therefore Socrates is mortal"*

4.3.1.2 *Ad hominem*

Ad hominem ("to the man") arguments attack a person's character, without attacking their argument. However, they can be a viable tactic in rhetorical debate and can introduce both new I-, CA- and PC-nodes to the structure when modelled. Figure 4.15 shows a reasonable *ad hominem* argument Walton (1987), such as *"You don't have any qualifications in that area, don't make*

such broad statements." Figure 4.16 shows a more aggressive tactic that disparages someone's argument and them as a person, such as *"They're an idiot, don't listen to them."* Figure 4.17 shows an abusive argument that contains no information, instead attacking the person directly and trying to shut them out of the debate, for example *"**** off and die!"* These examples in particular show that a fallacy can take multiple forms and have multiple logical and/or rhetorical contributions to the overall discussion.

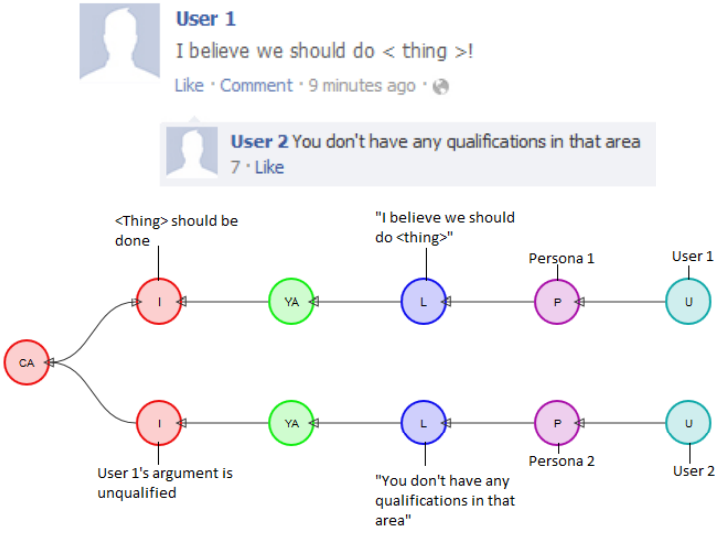


Figure 4.15: Example of a reasonable *ad hominem* attack

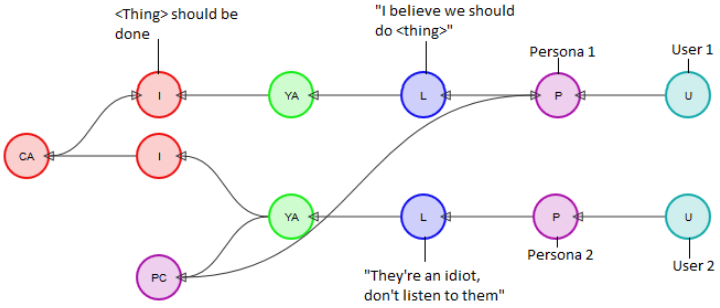


Figure 4.16: Example of an *ad hominem* attacking both persona and argument TODO: consider adding 'dummy' FB images

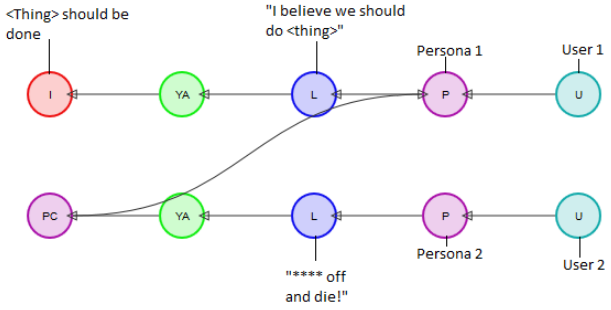


Figure 4.17: Example of an abusive *ad hominem* TODO: consider adding 'dummy' FB images

4.3.1.3 Appeal to Consensus

The appeal to consensus is the fallacy that because a claim is popular or widely-held, it is true. An example of this can be shown in Figure 4.18.

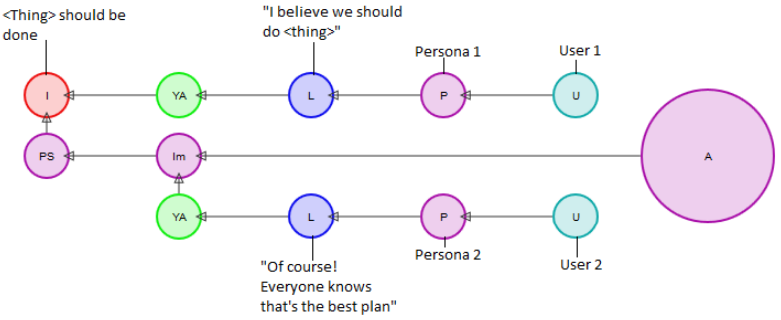


Figure 4.18: Example of an appeal to consensus TODO: consider adding 'dummy' FB images

4.3.1.4 Association Fallacy

The association fallacy is the notion that because a person is associated with, or shares the views of, an undesirable group, their claims are wrong. An example of this can be shown in Figure 4.19.

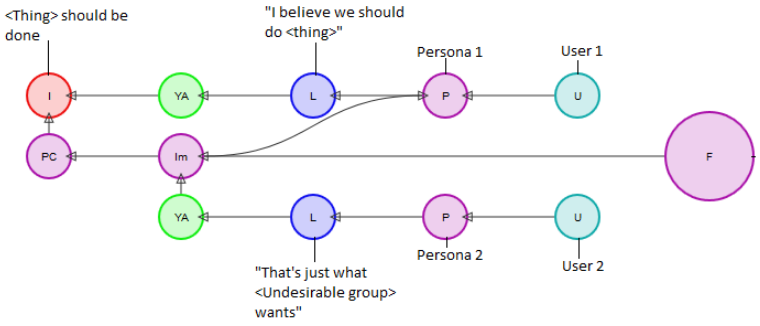


Figure 4.19: Example of the association fallacy

4.3.1.5 Appeal to Humour

An appeal to humour is a technique by which a participant in the debate attempts to ingratiate themselves with their audience by making a joke about the situation as shown in Figure 4.20. This can be coupled with an *ad hominem* attack, when the joke is made at someone else's expense, as shown in Figure 4.21.

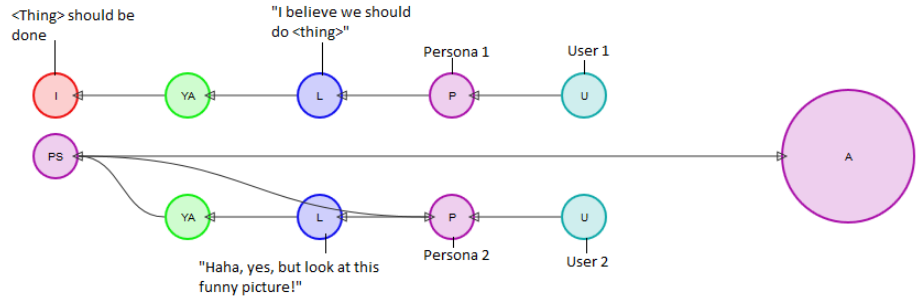


Figure 4.20: Example of an appeal to humour

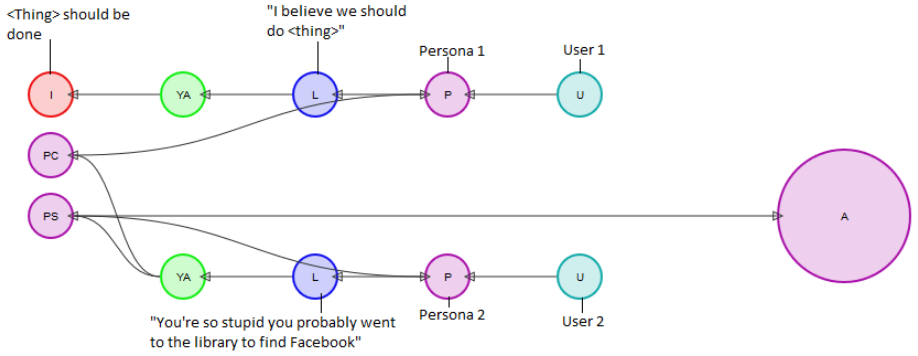


Figure 4.21: Example of an *ad hominem* appeal to humour

4.4 Expert Review

Six experts, from the fields of argumentation systems, web science, philosophy, and linked data, were chosen to review these proposed additions to the model.

Experts A and B have a background in argumentations systems and modelling argumentation, and are familiar with the AIF. Expert A is a computer science lecturer whose research is concerned with argumentation-based models of communication and formal reasoning, with interests in AI and behaviour change. Expert B is a post-doctoral researcher with degrees in library and information science, mathematics, and liberal arts whose thesis focused on the problem of analysing, integrating, and reconciling information in online discussions.

Expert C is a web-science graduate student, researching the relation between social structures in virtual worlds and the real world, with a focus on practices of gender and power.

Expert D is a philosophy graduate student, specialising in ethics, moral obligations and with a background in argumentation and formal logic.

Experts E and F are specialists in the area of open and linked data working in web and data innovation and development. Expert E is an institutional open data specialist and Expert F is a senior technical specialist.

1. **User 1:** *The tech industry is often biased against women*
   User 2: *@User1 You would say that, you're a woman*
   User 3: *@User1 **** off and die you ****ing nazi before I come and **** you up*

2. **User 1:** *Guns killed 33,000 people last year, they need to be banned*
   User 2: *@User1 And a lot of those were minors*
   User 3: *@User2 According to who?*

3. **User 1:** *What does Barack Obama call illegal aliens? Undocumented democrats!*
   User 2: *@User1 You're so stupid you probably went to the library to find Facebook*

Figure 4.22: The three argumentation samples the experts were asked to model

Each expert was provided with a document describing the background of this area and an overview of the existing models (reproduced in Appendix A). They were then asked to model three argumentation samples shown in Figure 4.22, illustrating a variety of different rhetorical structures, by speaking aloud and/or sketching with pen and paper. They were then shown the additions to the model, and asked to model the three argumentation samples again. They were then asked a series of semi-structured question aimed to evaluate their thoughts on how best (and whether) to model social (and anti-social) argumentation, the completeness of the ontology, the clarity of the ontology and the consistency of the ontology.

4.4.1 Results and Analysis

Table 4.5 shows an overview of the key points discussed by the experts along the themes of modelling social argumentation, completeness, clarity and consistency (and relevant sub-themes).

Table 4.5: Summary of experts' opinions on key aspects of ASWO

Theme	Sub-theme	Comments
Social Argumentation	*Value*	*"...if we're going to have a realistic model of how people argue, we've got to look at how people really argue rather than how our "ideal reasoner" would argue"* – Expert A *"I think modelling social argumentation is very important...I want to say it's useful in trying to help people argue 'better'."* – Expert D
	Challenges	*"Even in quite a simple back-and-forth argument, there's quite a lot going on...scale is a challenge"* – Expert C

		"...enthymemes, humour, there's lots of missing information, there's lots of playing to particular audiences...there are lots of things that are current events or would only make sense to a particular group" – Expert B
	Abuse/Threats	*"I, personally, tend to ignore all of those because I'm...focusing on the informal proof structures"* – Expert A *"...it's hard to exclude them...if you think about what you're going to do with the model...do you want to retrieve threatening and abusive comments? Well you might want to exclude them from being retrieved, which also makes it relevant to model that"* – Expert B
Completeness	*Implicit/Explicit Premises*	*"I think when people model arguments it's pretty common to infer the reading, and what's interesting is that there can be multiple readings. So it wouldn't be wrong to...put in some interpretation, as long as it's clear it's an interpretation and there can be others. "* – Expert B
	Social Meta-Data	*"One other thing... is other people's opinions of statements. A lot of systems have thumbs up and thumbs down...what you need is, I think, an audience response"* – Expert F
Clarity	*Generalisation*	*"If anything I think maybe your default conflict is a superclass - everything is a conflict, and one of the subclasses is a...rational argument. But then you've also got personal attack, ad hominem...these are all alternatives to rational argument, but at the default it might be worth allowing modelling of a conflict. Not a conflict as it is in the original model, but as a superclass of interaction."* – Expert F

	Ambiguity	TODO: EXPAND OUT THESE TOO *"If a..."* – Expert D TODO: Assumptions RE gender of participants etc – Expert E
Consistency	*Internal consistency*	*"whenever you try to model anything in a formalised system...if you give two people the same thing...unless it's something really simple, they will always find two different ways of modelling it"* – Expert E *"...rather than having the minimal number of nodes and encouraging people to just misuse them, I would rather say 'Here's a definite type of argumentation we want to capture and share..."'* – Expert A
	External consistency	*"Consistent with [the AIF], maybe not, but building on? Definitely"* – Expert C

4.4.1.1 Social Argumentation

Each of the experts agreed that there was value in modelling social argumentation, Expert F going so far as to say they believed there was no argument that didn't have social components. Expert D discussed how understanding the nuances of how people argue socially could lead to ways of helping or encouraging them to argue "better", in a more cooperative or polite manner.

The challenges of modelling social argumentation the experts foresaw were mostly a question of scale. In part, the sheer volume of data in a social media discussion can be overwhelming, particularly when considering the speed with which in can grow, but also in terms of the variety of information, which is often contextual, such as references to current events, or cultural "in-jokes".

Experts A and D explained that they would not consider abusive argumentation as a valid when modelling an argumentation structure (as they focused broadly on dialectic arguments and that was the current standard for their domain), although they agreed it was a potentially valuable area to explore. Expert B explain that it depended very much on the purpose of the model — in some cases it may be important to model threatening and abusive attacks specifically so they can be excluded when presenting the model to users. Expert E also noted that excluding this type of argument can lead to confusion if a particular abusive comment changes the course of the argument, or causes the quality of the rest of the discussion to degenerate.

4.4.1.2 Completeness

Experts A and B both made explicit mention of the ability to mark certain posts as being in direct response to other participants in the discussion as a useful addition to argumentation frameworks.

Expert B noted that as many annotations have the potential to be subjective, it would be possible to extend this to include further subjective annotations such as an analyst's confidence in a particular reading of an inference. Expert C had similar views and discussed including mappings of a participant's agreement or disagreement with key positions in the dialogue as well.

Expert F discussed the potential for an "activity" score for each locution, derived from the social meta-data of each post (e.g. number of replies, number of up- or down-votes or number of retweets); this metric could be derived on a per-purpose basis to allow analysts to correctly categorise different platforms for their own needs, and to highlight key areas of the discussion that had solicited or stimulated large amounts of discussion.

Broadly, all experts agreed that to adequately model social argument that it was necessary to include further context about the participants, such as demographic information where available, such as by linking the SIOC UserAccount to a FOAF Agent, or additional information about key events related to the discussion to maintain relevance of the model for future analysis, and to limit the number of assumptions needed to be made by analysts.

4.4.1.3 Clarity

Expert D was concerned that, when faced as an analyst with a statement that appeared ambiguous (for example, a statement of support that could be interpreted as genuine or sarcastic) they may struggle to accurately and objectively model it, and proposed a means of allowing analysts to mark such relations as existing without committing to associating them with either a support or an attack.

Expert F proposed a similar solution, by means of generalising the model to include super-classes of Support and Conflict. "Personal" conflict, for example, is perhaps too specific a name for all non-logical conflicts: there are rhetorical attacks that can target institutions or accounts run by software, but also, importantly, positions and information. These Support and Conflict super-classes would encompass Logical Support/Conflict and Rhetorical Support/Conflict and could then be further sub-classed to provide more specific instances of each, where apparent, allowing analysts to defer when unsure.

4.4.1.4 Consistency

The majority of experts felt that these additions to the ASWO were consistent with the nodes used in the AIF. However, Experts C and F disagreed, pointing to the fact that the ASWO was intentionally inconsistent with the AIF because they were developed for different purposes.

In terms of inter-rater reliability — whether two analysts attempting to model the same argument would reach the same result — the experts were much more divided. While they agreed that the objective parts of the model (i.e. the locutions, user account and, in most circumstances, the persona) could be modelled identically (and in most cases, automated), Experts C and B felt that both analysts would reach the same conclusion overall with minor deviations, whereas Experts A , D and E disagreed, stating there was too much subjective information to model identically. Expert A felt that the analyst would naturally perceive the argument through their own lens of cultural and social context and Expert D noted the different levels of detail an analyst may choose to use, whether focusing only on premises that have been explicitly stated, or including additional implicit information.

How important this is was also a matter of some debate: Experts B and C felt that it was likely there would (and should) be one "correct" representation of an argument. Experts D and F agreed to an extent, citing their proposals for handling ambiguous content being able to aid annotators in this regard, so that if the model could not be complete, it could be consistent. Expert A felt that ideally analysts should reach the same conclusion but in practice, the subjective nature of the task might make this impossible. Expert E felt the consistency of annotators would, in practice, be less important and would be a factor of the intended purpose of the model.

4.5 Summary

TODO: Tidy, refactor, make leading rather than concluding

In this chapter, further extensions to the ASWO are introduced, to incorporate other modes of rhetorical persuasion that contrast with logical argument. An expert review was conducted, which highlighted some key strengths of this model, such as the ability to model directed replies, the ability to model the audience and the ability to model instances of irrational and eristic argument that were previously difficult or impossible to achieve with the AIF alone. These results were presented at the conference on Computational Models of Argument (Blount et al., 2016).

Because social argumentation can rely heavily on nuanced contextual information (such as the ability to recognise humour, sarcasm or references to current events) it is likely impossible to model it in such a way that it could be automatically reasoned over. However, because the

ASWO provides additional information about rhetorical tactics in use, human analysts can explore the resulting structure in greater detail and context. This can also potentially be used to highlight areas of particular interest, or assist in community decision-making environments.

Chapter 5

Case Studies of Argument

This chapter consists of gathering social media data from three "live" sources from the web and annotating them with a categorisation system based on the categories reviewed in Chapter **??**. The distribution of social features (such as replies etc.) and annotations is examined and discussed, and a narrative analysis of three threads is conducted, to discuss some of the features that can be observed on different social platforms in different contexts.

5.1 Methodology

5.1.1 Data Sample

Social media posts for this experiment were sourced from Facebook, Twitter and Reddit. From Facebook and Twitter, posts were collected by gathering the 100 most recent posts from five major news distribution networks (*BBC News*, *Sky News*, *CNN News*, *The Guardian*, and *The Daily Mail*) and all replies associated with them. Because of the "subreddit" structure of Reddit (there are many "sub" sites focusing on individual topics), and becuase these institutions do not maintain official accounts or an otherwise high-profile, active presence on Reddit, this potion of the data sample was sourced instead by collecting the top 500 "hot" posts from the World News subreddit[1]). "Hot" posts, the default view of subreddits, are determined by those with the most upvotes, and are weighted towards more recently active posts (Van Mieghem, 2011).

These threads were then pruned to ensure they contained some form of discourse; that is to say they contained at least two replies, made by at least two different users. Applying this filter resulted in 500 threads from Facebook, 403 from Twitter and 247 from Reddit.

These threads were then examined based on a number of different factors to determine the shape of a "typical" thread for each platform. These factors were the *total comments*, *comment length*,

[1] https://www.reddit.com/r/worldnews/

Table 5.1: Distribution of total number of comments in each thread

Platform	**Min.**	**Lower Quartile**	**Median**	**Upper Quartile**	**Max.**	**Mean**	σ
Facebook	3.00	43.00	96.00	189.00	2478.00	179.976	274.449
Twitter	3.00	5.00	9.00	15.00	193.00	11.717	12.693
Reddit	3.00	4.00	10.00	70.00	4938.00	157.081	522.048

comments per user and *replies*. Tables 5.1, 5.2, 5.3, and 5.4 show a further breakdown of each of the measures used to determine a typical thread for this purpose. These graphs are also shown in Appendix B.

Table 5.1 (and Graphs B.1, B.2 and B.3) shows the distribution of the total number of comments in each thread. Naturally, the minimum number of comments for each thread is three; the original post, and two additional, the qualify it as discursive. However, the maximum number of comments was substantially larger, and varied hugely between platforms. Twitter had the smallest range, with 193, and a correspondingly tighter spread. Both Facebook and Reddit had a much greater maximum, with approximately 2500 and 4000 respectively. However, in both cases, these were decidedly outliers.

Table 5.2 (and Graphs B.4, B.5 and B.6) shows the distribution of the average comment length in each thread. In a similar pattern to the total number of comments, the length of comments on Facebook and Reddit also displays a distribution of a curve centred around the lower end of the range with a 'long tail' of outliers. The distribution of comment lengths for Twitter appears as a more traditional bell-curve. This is likely due to the upper-limit on comment length, restricting the total size of comments that users can post.

Table 5.3 (and Graphs B.7, B.8 and B.9) shows the distribution of the total number of comments made by each user, in each thread. All three platforms had a very low number of different comments per user, Facebook in particular never exceeding 1. Twitter and Reddit both had mean and median values close to 1, with $\sigma < 0.7$ and $\sigma < 0.5$ respectively.

Table 5.4 (and Graphs B.10, B.11 and B.12) shows the distribution of the total number of direct replies to other comments within each thread. Interestingly, Facebook appeared to have zero direct intra-thread replies. Whether this is due to people unwilling to use the (at the time) new feature, or due to already having other methods (such as tagging) to denote replies is not known.

Threads that fell outside of the interquartile range were removed from the sample. This left 139 Facebook threads (with a total of 14,556 individual posts), 113 Twitter threads (with a total of 1,021 individual posts), and 52 Reddit threads (with a total of 1,123 individual posts.

5.1.2 Annotation

A classification system was devised based on the previous extensions proposed to the expert review in Chapter **??**. For this, only the nodes determined present in each locution were required

Table 5.2: Distribution of comment length (in characters) in each thread

Platform	**Min.**	**Lower Quartile**	**Median**	**Upper Quartile**	**Max.**	**Mean**	σ
Facebook	24.00	68.00	103.50	161.25	715.00	127.936	90.983
Twitter	38.00	69.00	83.00	96.00	136.00	82.553	18.835
Reddit	27.00	97.00	173.00	260.50	697.00	200.870	132.320

Table 5.3: Distribution of the number of comments per user in each thread

Platform	**Min.**	**Lower Quartile**	**Median**	**Upper Quartile**	**Max.**	**Mean**	σ
Facebook	1.00	1.00	1.00	1.00	1.00	1.000	0.000
Twitter	1.00	1.00	1.00	1.00	13.00	1.062	0.637
Reddit	1.00	1.00	1.00	1.00	4.00	1.182	0.480

Table 5.4: Distribution of the number of internal replies in each thread

Platform	**Min.**	**Lower Quartile**	**Median**	**Upper Quartile**	**Max.**	**Mean**	σ
Facebook	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Twitter	1.00	4.00	7.00	14.00	192.00	10.442	12.627
Reddit	0.00	1.00	5.00	49.00	4372.00	129.526	443.849

to be marked; as such, no relationships between nodes were taken into account for this data set. The possible categories were as follows: Information, Transition, Logical Attack, Logical Support, Rhetorical Attack, Rhetorical Support, Preference, Entity, Group, Audience, Implied Relationship, and Implied Belief .

These are broadly similar as those proposed to the experts in Chapter **??**; however, Personal Support/Attack has been explicitly renamed to Rhetorical Support Attack, to encompass instances where it is not a person that is directly being supported or attacked. Similarly, Persona has been renamed Entity, and Faction renamed to Group. Implications were split into two types: Implied Relationship and Implied Belief

During the annotation process, it was deemed necessary to introduce three other categories to account for circumstances not otherwise covered. These categories are as follows: Spam/Advertisement, which encompasses (often automated) posts that promote a business or service unrelated to the discussion; Unknown, which encompasses posts in a language unknown to the annotator, broken or corrupted text or emojis, or any other circumstances in which the intent of the post cannot be reasonably assumed; and None, encompassing circumstances when a post is totally blank, or blank apart from "tagging" a user (to alert them of the thread).

5.2 Data Analysis

TODO: Move comment length etc. here?

Table 5.5: Classifications present alongside *n* other classifications

Classification	**Total**
Information	675
Transition	71
Logical Attack	168
Logical Support	32
Rhetorical Attack	474
Rhetorical Support	295
Preference	5
Entity	534
Group	89
Audience	157
Implied Relationship	7
Implied Belief	38
Spam/Advertisement	24
Unknown	37
None	42
Total	

Table 5.6: Classifications present alongside *n* other classifications

Classification	**Number of Other Classifications Present**						
	0	**1**	**2**	**3**	**4**	**5**	**6**
Information	216	183	169	64	34	6	3
Transition	22	30	10	2	4	3	0
Logical Attack	2	112	18	31	3	1	1
Logical Support	0	24	4	3	0	1	0
Rhetorical Attack	48	172	142	65	36	8	3
Rhetorical Support	30	74	33	84	62	9	3
Preference	0	2	2	1	0	0	0
Entity	0	196	133	131	62	9	3
Group	0	15	34	26	10	2	2
Audience	0	0	11	80	56	7	3
Implied Relationship	0	0	2	5	0	0	0
Implied Belief	0	1	15	17	4	1	0
Spam/Advertisement	23	1	0	0	0	0	0
Unknown	37	0	0	0	0	0	0
None	42	0	0	0	0	0	0

TODO: Annotations In terms of annotation

Table 5.5 shows the total number of annotations

Table 5.6 shows the number of annotations present alongside *n* other annotations. For example

Table 5.7 shows how this is

Table 5.7: Posts that are classified as (at least) both *x* and *y*

	Information	**Transition**	**Logical Attack**	**Logical Support**	**Rhetorical Attack**	**Rhetorical Support**	**Preference**	**Entity**
Information	N/A	25	159	31	217	90	4	215
Transition	25	N/A	9	0	15	7	0	14
Logical Attack	159	9	N/A	4	43	7	1	34
Logical Support	31	0	4	N/A	5	3	0	6
Rhetorical Attack	217	15	43	5	N/A	61	2	330
Rhetorical Support	90	7	7	3	61	N/A	0	249
Preference	4	0	1	0	2	0	N/A	1
Entity	215	14	34	6	330	249	1	N/A
Group	66	1	9	2	80	19	1	29
Audience	42	8	2	1	52	138	0	145
Implied Relationship	5	0	0	0	3	2	0	4
Implied Belief	22	2	1	0	22	4	0	16
Spam/Advertisement	1	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0
None	0	0	0	0	0	0	0	0

	Group	**Audience**	**Implied Relationship**	**Implied Belief**	**Spam/Advertisement**	**Unknown**	**None**
Information	66	42	5	22	1	0	0
Transition	1	8	0	2	0	0	0
Logical Attack	9	2	0	1	0	0	0
Logical Support	2	1	0	0	0	0	0
Rhetorical Attack	80	52	3	22	0	0	0
Rhetorical Support	19	138	2	4	0	0	0
Preference	1	0	0	0	0	0	0
Entity	29	145	4	16	0	0	0
Group	N/A	7	4	14	0	0	0
Audience	7	N/A	0	21	0	0	0
Implied Relationship	4	0	N/A	1	0	0	0
Implied Belief	14	21	1	N/A	0	0	0
Spam/Advertisement	0	0	0	0	N/A	0	0
Unknown	0	0	0	0	0	N/A	0
None	0	0	0	0	0	0	N/A

5.3 Narrative Account

In this section, one thread from each of the social media platforms is examined as a case study. These threads are reproduced in full in Appendix C.

5.3.1 Facebook

Section C.1 shows a thread on Facebook, starting with the post:

"US election 2016: Trump wins Nevada - Strengthening his position in the Republican presidential race."

The overall structure of this thread is very flat, with no nested replies. The majority of users post a comment sharing their own views, predominantly supporting or attacking Trump. Often, these posts are self-contained, relating to no other information in the thread aside from the original article. These range from relatively short, such as:

"Say 'NO' to Trump Sheeples"

or:

"Yes trump love it .from the UK"

which simply voice support or opposition to Trump as a candidate, and implicitly signal the user's own political beliefs. In contrast, some users post highly detailed and articulate arguments, explicitly spelling out why they believe a certain way:

"Interesting times we live in. I'd really like to see Trump and Sanders win their respective party's nomination. I think they might both force our two political parties to reform and produce better candidates. It'd be nice to see them shake up DC too, they're both political outsiders and it seems most establishment politicians aren't very fond of either of them."

A number of users post comments simply to tag other users (presumably friends) to notify them of the story. Some users, possibly bots, also use the thread to advertise t-shirts, or other seemingly unrelated news-stories, likely due to the large user-density of Facebook. Broadly speaking, due to the lack of explicit intra-thread replies, it appears that users mostly use Facebook to signal their own views, without directly engaging in discussion with other users in the same thread, while at the same time using it to highlight particular posts of interest to friends who may not otherwise see them.

Figure 5.1 shows that the vast majority of comments made are rhetorical in nature, and the majority of those are attacks. This is ultimately likely to be down to the topic at hand; topics about a particular individual often draw a large about of ire from the social web, particularly one as divisive as a politician. Figure 5.2 mirrors this, showing that most users post a rhetorical

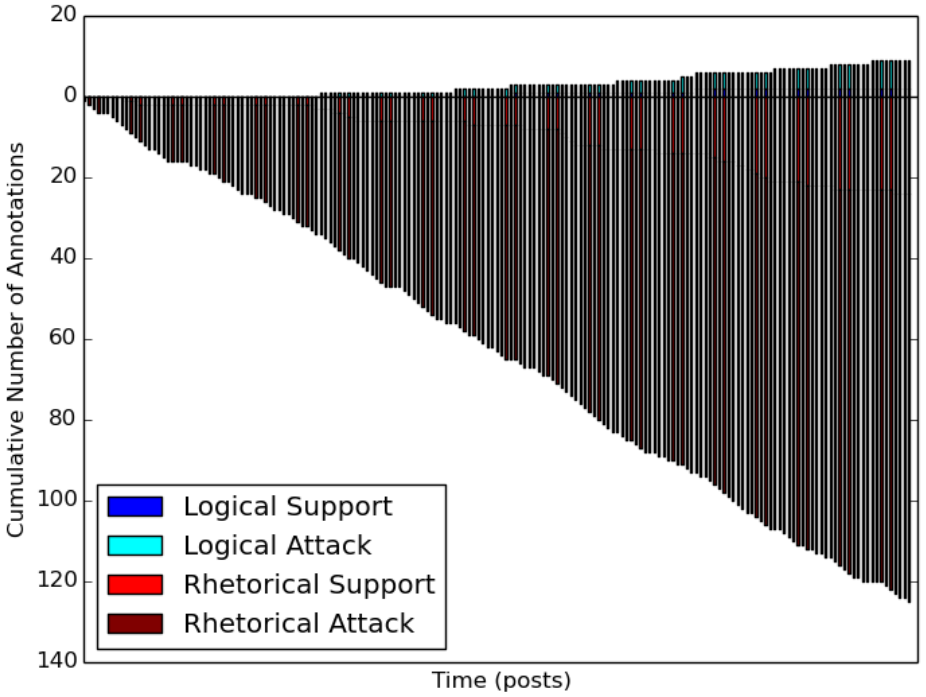


Figure 5.1: Cumulative logical and rhetorical tactics over time on Facebook

comment. It also highlights that, throughout the entire thread, only one user posts more than once.

5.3.2 Twitter

Section C.2 shows a thread on Twitter, starting with the post:

"Kesha 'in tears' after judge denies her release from Sony where producer allegedly raped her https://t.co/thYQgcH9AW https://t.co/XBnz5x5fIJ"

Here, more intra-thread replies can be observed, with users directly and explicitly replying to one-another, either to make a counterpoint:

"@Btwsts @DailyMailCeleb you do realise thats slander without proof, If sony wanted too they could sue you. People have been sued for less."

or to request more information on the topic:

"@Btwsts what rape?"

(if taken literally; read another way, this post could instead be voicing disbelief/scepticism, again highlighting the difficulties with a lack of tone or other familiar vocal or physical language cues).

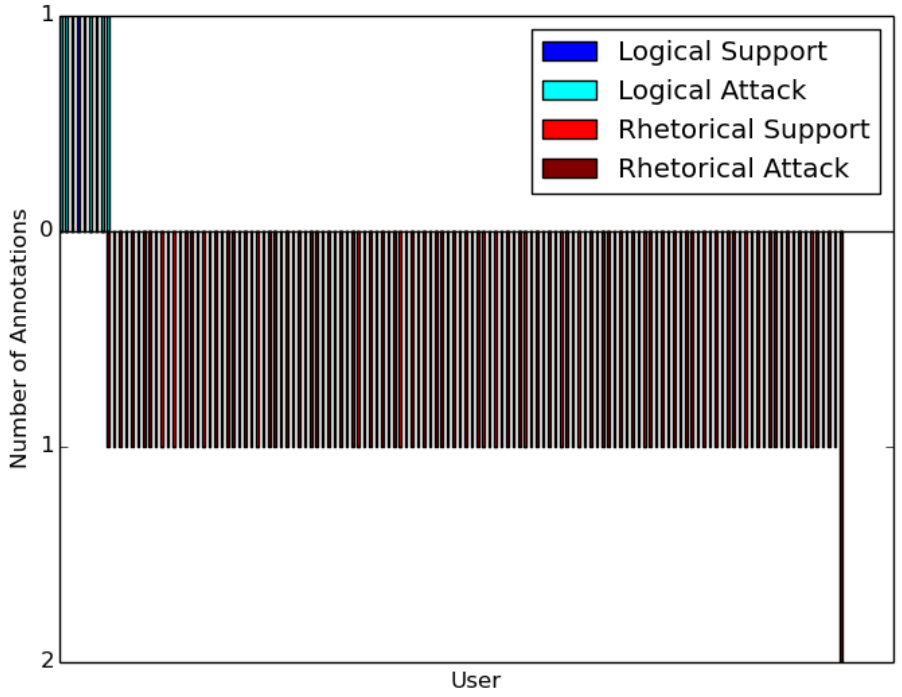


Figure 5.2: Logical and rhetorical tactics per user on Facebook

One user also reposts the entirety of the original post, verbatim:

"RT @DailyMailCeleb: Kesha 'in tears' after judge denies her release from Sony where producer allegedly raped her https://t.co/thYQgcH9AW ht"

By doing this, they share this content with their own followers as well. However, in doing this they also choose to reply to the original post, which is not required.

TODO: The twitter graphs don't seem quite right; not enough posts? Check those numbers

5.3.3 Reddit

Section C.3 shows a thread on Reddit, starting with the post:

"Brexit against Scotland's wishes would 'almost certainly' trigger independence referendum, warns Nicola Sturgeon".

This thread had many more internal replies than either of the others, with discussion moving back and forth between different "sub-threads": Reddit, unlike the two previously observed platforms highlights replies by indenting them within the body of the page for greater clarity.

Comments routinely refer directly to the comments they reply to, for example:

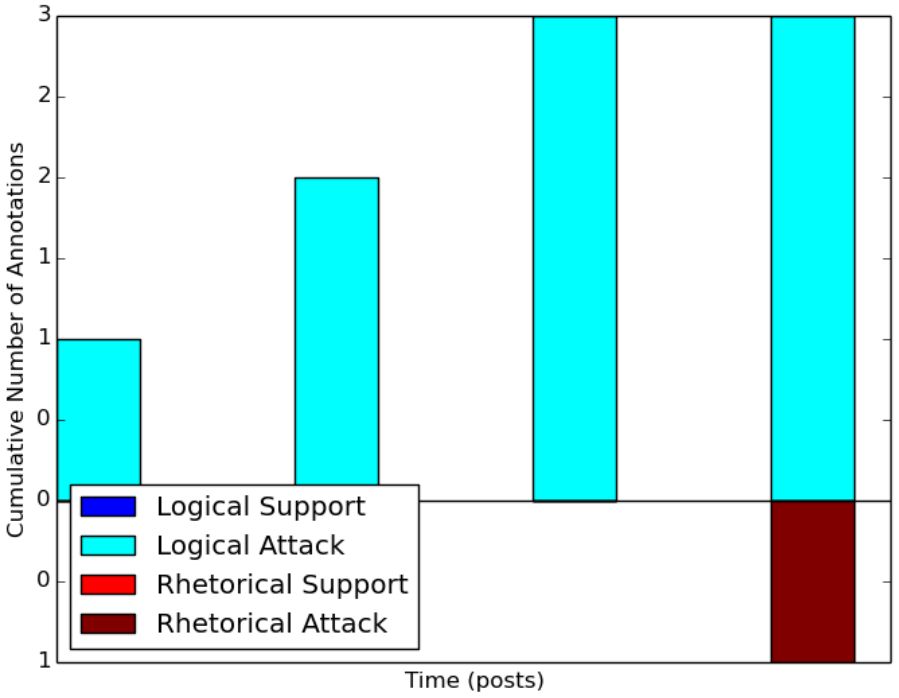


Figure 5.3: Cumulative logical and rhetorical tactics over time on Twitter

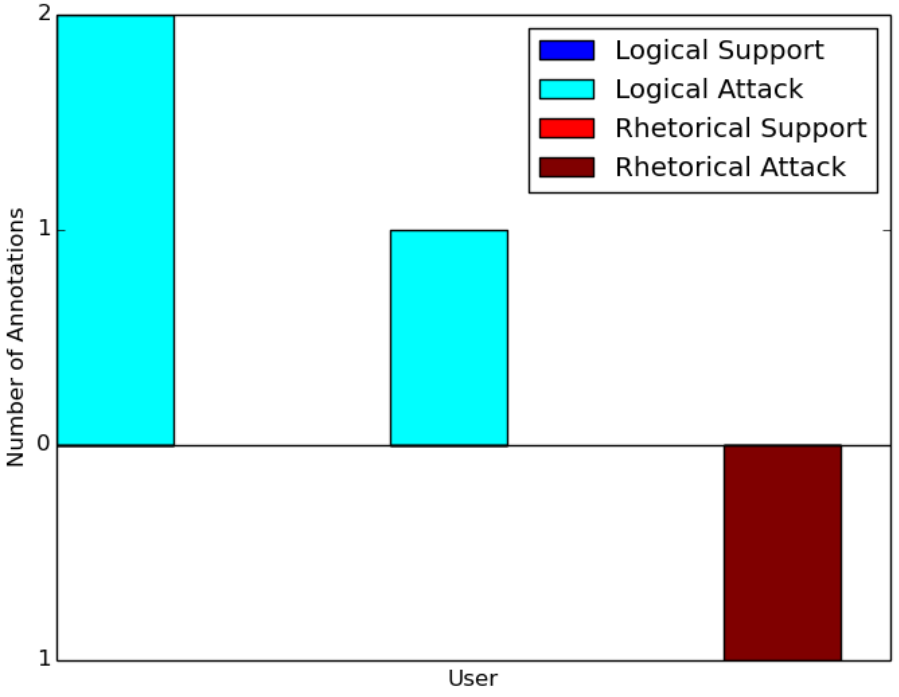


Figure 5.4: Logical and rhetorical tactics per user on Twitter

"You actually can call for a referendum whenever you want."

"Like France, Ireland etc."

or in other instances:

"that arsey dwarf is (one of) the reasons why we've got a tory government"

"If every single person in Scotland voted labour, the Tories still would have won"

"the snp claimed labour would need them to govern, and that scotland would have the sway over a future labour government.

great for her home audience, but the tories used it to make labour look like their puppet- a british parliament working for scotland.

so scotland gets all those mps but as you say, not enough to decide any policies AND they ensured a tory victory.

edited for my shocking spelling"

This highlights that, on Reddit, people are more inclined to argue or discuss in good-faith, even when resorting to crude humour or vulgar language. This is perhaps unsurprising: as users must specifically browse to this subreddit, rather than come across such posts by chance.

Interestingly, this thread also contains a post from a bot (that acknowledges itself as such) that provides a summary of the article reference in the original post, for users too busy or unwilling to read the entire article, allowing them to still contribute to the discussion.

Figure 5.5 shows that while there is still a clear prevalence of attack over support (as might be expected in an argument) although interestingly, in this topic at least, logical attacks are favoured over rhetorical attacks and, within rhetorical tactics, support is favoured over attack. Figure 5.6 shows that some users choose to post only a single comment, using various tactics, others engage further, posting multiple times and using an array of different tactics, both logical and rhetorical.

5.4 Summary

This chapter examined the structure of "normal" social media threads and compared them with one another, as well as a set of individual case-studies.

From the case studies it can be seen, anecdotally at least, that Facebook users tend to post as a way of presenting their opinion to the audience, without necessarily engaging further in the discussion: a "fire and forget" approach. Conversely, Reddit users seem more proactive with engaging with the discussion, and other users. This is likely due to the fact that

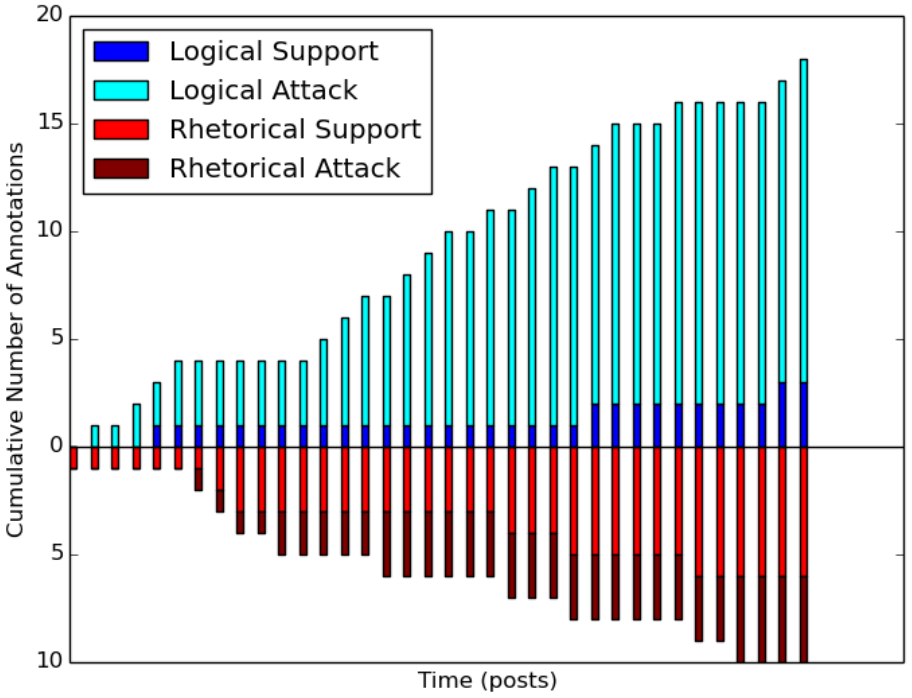


Figure 5.5: Cumulative logical and rhetorical tactics over time on Reddit

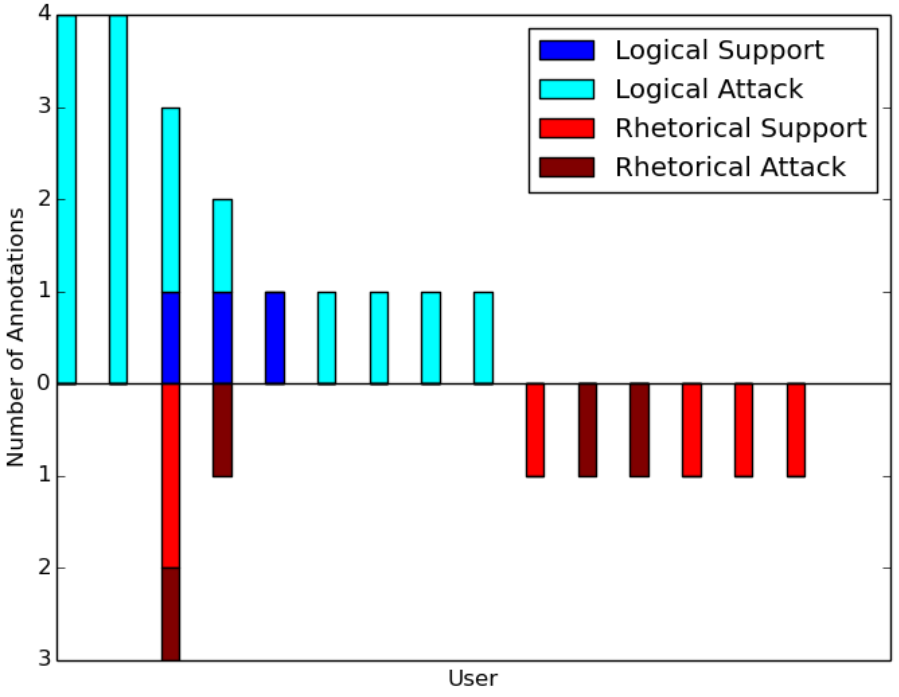


Figure 5.6: Logical and rhetorical tactics per user on Reddit

Chapter 6

Perception of Rhetorical Tactics in Individual Comments

This chapter examines how the different types of argument discussed in the previous chapter are perceived by their audience. An experiment was carried out in which participants were shown a number of social media posts, and asked a series of questions (answerable on a Likert scale) about each one. These questions gauged both how they felt about the post (e.g. entertained or offended), and how they would act on it (e.g. replying or reporting).

6.1 Methodology

6.1.1 Data Sample

This work used the "normal" threads acquired in Section 5.1.1.

Each of these "normal" threads was then annotated by topic, using one of the following categories based on an aggregation of the topics provided by the five news distribution sites the social media accounts of which the stories were sourced from: *Current Events*, stories covering recent or ongoing occurrences; *Business*, stories involving businesses and/or the economy; *Politics*, stories relating to politics, politicians, elections, etc.; *Science & Technology*, stories relating to science, the environment, new technologies, etc.; *Entertainment & Arts*, stories involving cultural events, celebrities, etc.; *Sports*, stories covering sporting events and participants; and *Features*, stories that form an opinion piece, or focus on an individual rather than the broader story they are a part of.

6.1.2 Classifications

TODO: Argument

Table 6.1: Threads by topic

Platform	Current Events	Business	Politics	Science & Technology
Facebook	52	18	23	16
Twitter	53	3	24	12
Reddit	41	4	2	6

Platform	Entertainment & Arts	Sports	Feature
Facebook	20	3	32
Twitter	12	3	20
Reddit	2	0	0

TODO: Social Kietzmann et al. (2011) describe seven Identity, Sharing, Presence, Relationships, Reputation, Groups, and Conversations

Table 6.2 summarises each of these classifications, and provides justification for their inclusion.

6.1.3 Participants and Survey

Participants were invited via a general call on social media; they were provided an information sheet and consent form, and asked to confirm that they were above the age of eighteen. Participants were shown a selection eighteen posts taken from the sample described in Section 6.1.1 (three different news-types across three social media platforms). For context, they were also show the initial post in the thread and, if present, any post that was directly replied to by the target. These were presented to participants via a web-survey, a screenshot of which is shown in Figure 6.1.

Every participant was also shown, and asked to rate, two additional posts common to all participants to judge the overall inter-rater agreement. These were selected at random from the sampled pool of comments and manually inspected to ensure they were non-empty and comprehensible (e.g., English-language).

6.2 Data Analysis and Results

6.2.1 Raw Data

Table 6.3 shows the raw answers that participants gave to the questions overall. Even here, it is relatively easy to see (from questions 6-9) that the majority of people would not be inclined to interact or engage with the comments that were presented here. In addition to these results, 45 people skipped this question

Table 6.4 shows the number of responses given per each different annotation type. Note that as a post may have multiple annotations, there may be (and is likely to be) overlap in the number of responses. From this we can see the distribution of annotations, combined with random

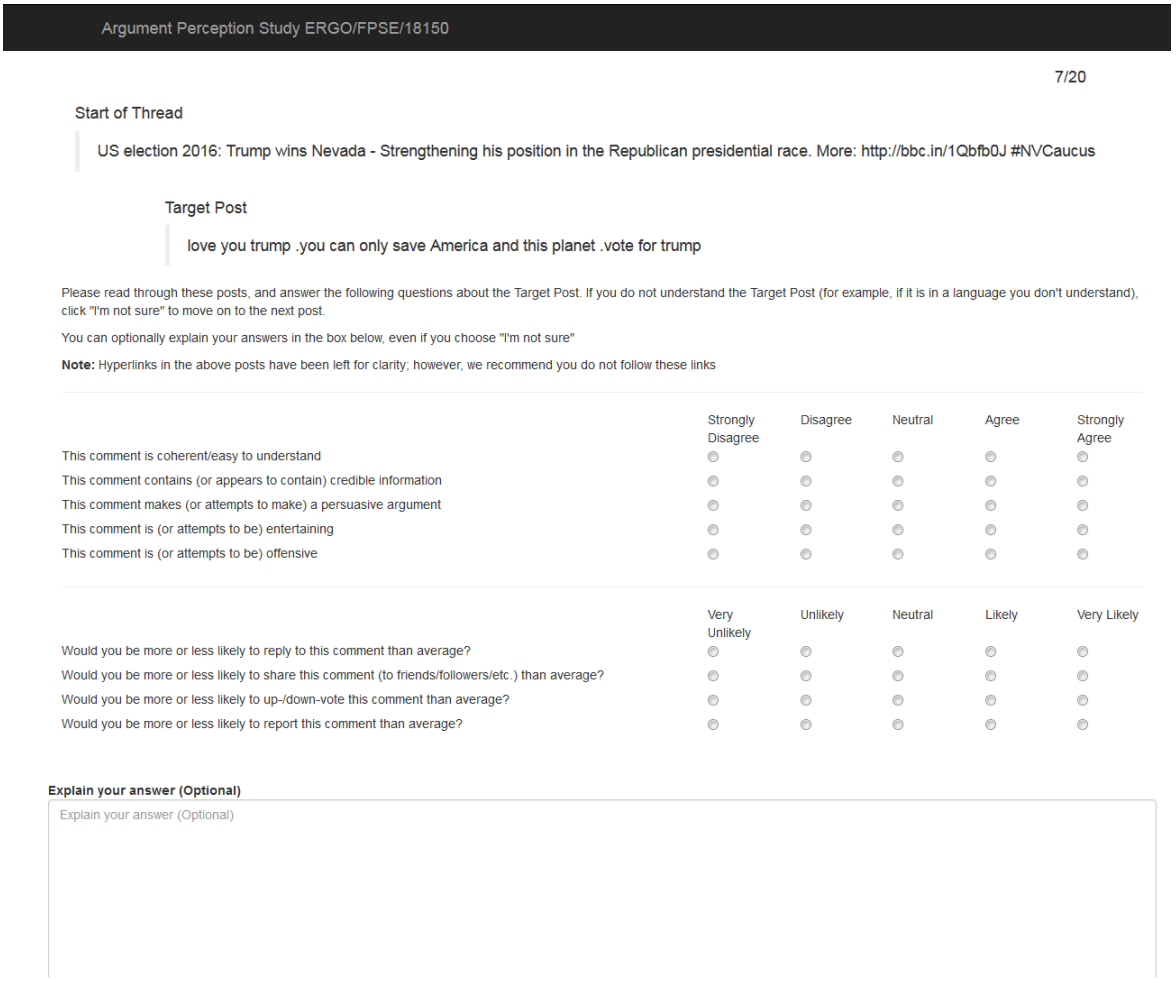


Figure 6.1: The questionnaire as presented to participants

Table 6.2: Example classifications of argumentation posts

Factor	**Description**
Coherence	Whether the post is clear and understandable CITATION NEEDED
Credibility	Whether the post contains (purportedly) credible information CITATION NEEDED
Persuasiveness	Whether the post attempts to change the readers position (Sundar, 2000)
Entertainment	Whether the post engages or bores the reader (Sundar, 2000)
Offence	
Reply	How likely the reader is to reply(Markova and Petkovska-Mirčevska, 2013) (Kietzmann et al., 2011)
Share	(Markova and Petkovska-Mirčevska, 2013) (Kietzmann et al., 2011)
Vote	(Markova and Petkovska-Mirčevska, 2013) (Kietzmann et al., 2011)
Report	(Kietzmann et al., 2011)

Table 6.3: Breakdown of answers given for each question

Question	1	2	3	4	5
This comment is coherent/easy to understand	48	134	71	374	119
This comment contains (or appears to contain) credible information	127	230	224	133	32
This comment makes (or attempts to make) a persuasive argument	111	172	159	252	52
This comment is (or attempts to be) entertaining	126	189	151	220	60
This comment is (or attempts to be) offensive	165	208	194	143	36
Would you be more or less likely to reply to this comment than average?	232	216	183	108	7
Would you be more or less likely to share this comment (to friends/followers/etc.) than average?	291	226	176	51	2
Would you be more or less likely to up-/down-vote this comment than average?	207	179	195	143	22
Would you be more or less likely to report this comment than average?	296	204	211	30	5

selection and the ability of participants to skip questions, resulted in only one response for the *Spam/Advertisement* category, and only two for the *Preference* category. However, posts annotated as containing Logical Attack/Support and Rhetorical Attack/Support, the key element of this perception study, received over one hundred responses each.

Table 6.4: Number of responses given per annotation

Annotation	Number of Responses
Information	491
Transition	40
Logical Attack	146
Logical Support	27
Rhetorical Attack	256
Rhetorical Support	181
Preference	2
Entity	307
Group	55
Audience	104
Implied Relationship	7
Implied Belief	30
Spam/Advertisement	1
Unknown	4
None	10

Table 6.5: Breakdown of answers given for the first question

Question	**1**	**2**	**3**	**4**	**5**
This comment is coherent/easy to understand	6	23	8	16	2
This comment contains (or appears to contain) credible information	4	18	22	10	1
This comment makes (or attempts to make) a persuasive argument	7	11	8	24	5
This comment is (or attempts to be) entertaining	26	23	4	2	0
This comment is (or attempts to be) offensive	15	21	13	6	0
Would you be more or less likely to reply to this comment than average?	19	15	11	10	0
Would you be more or less likely to share this comment (to friends/followers/etc.) than average?	23	16	12	4	0
Would you be more or less likely to up-/down-vote this comment than average?	14	17	15	9	0
Would you be more or less likely to report this comment than average?	18	14	21	2	0

6.2.2 Inter Rater Reliability

To gain an additional insight of how much agreement there was between participants, and if there was particularly strong areas of agreement or disagreement, the first and last statements shown were identical to all participants. These statements were selected at random from the sample pool, but were manually inspected to ensure they were non-empty and comprehensible (e.g., English-language).

The first post, taken from Reddit, reads as follows: *The FSA is also irrelevant. Nusra and/or ISIS would be be the rulers if Assad collapsed. And also, NO the "FSA" is mostly islamists, most of the "secular rebels" have switched around and have become part of the SDF which is part of the YPG.* This was annotated as having Information, and a Logical Attack. Table 6.5 shows the raw answers that participants gave to the first question. In addition to these results, 10 people skipped this question. Table 6.6 shows the distribution of these answers: while there is a relatively large range between the minimum and maximum responses the standard deviation is not excessive. The largest value (1.218) was for the question *This comment makes (or attempts to make) a persuasive argument.* The lowest values were for the questions exploring the perception of entertainment and credibility (0.764 and 0.899 respectively).

The last post, taken from Twitter, reads as follows: *@steve_walke23 @guardian @lisaocarroll Some beings are inhuman - ISIS atrocities don't bother you? Get off your priggish high horse.*

Table 6.6: Distribution of answers given for the first question

Question	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
This comment is coherent/easy to understand	1.00	2.00	2.00	4.00	5.00	2.727	1.103
This comment contains (or appears to contain) credible information	1.00	2.00	3.00	3.00	5.00	2.745	0.899
This comment makes (or attempts to make) a persuasive argument	1.00	2.00	4.00	4.00	5.00	3.164	1.218
This comment is (or attempts to be) entertaining	1.00	1.00	2.00	2.00	4.00	1.673	0.764
This comment is (or attempts to be) offensive	1.00	1.00	2.00	3.00	4.00	2.182	0.955
Would you be more or less likely to reply to this comment than average?	1.00	1.00	2.00	3.00	4.00	2.218	1.107
Would you be more or less likely to share this comment (to friends/followers/etc.) than average?	1.00	1.00	2.00	3.00	4.00	1.945	0.961
Would you be more or less likely to up-/down-vote this comment than average?	1.00	1.50	2.00	3.00	4.00	2.345	1.031
Would you be more or less likely to report this comment than average?	1.00	1.00	2.00	3.00	4.00	2.127	0.916

Table 6.7: Breakdown of answers given for the last question

Question	**1**	**2**	**3**	**4**	**5**
This comment is coherent/easy to understand	0	6	3	19	3
This comment contains (or appears to contain) credible information	4	10	12	4	1
This comment makes (or attempts to make) a persuasive argument	2	3	6	18	2
This comment is (or attempts to be) entertaining	4	14	8	5	0
This comment is (or attempts to be) offensive	1	4	3	17	6
Would you be more or less likely to reply to this comment than average?	8	7	7	9	0
Would you be more or less likely to share this comment (to friends/followers/etc.) than average?	11	12	7	1	0
Would you be more or less likely to up-/down-vote this comment than average?	8	9	7	6	1
Would you be more or less likely to report this comment than average?	10	8	12	1	0

This was annotated as having Information and a Rhetorical Attack, directed against an Entity (in this case likely representing one of @steve_walke23 or @lisaocarroll, or potentially both).

Table 6.7 shows the raw answers that participants gave to the last question. In addition to these results, 2 people skipped this question. Because fewer people completed every question of the survey, dropping out before the total number of responses to these questions is lower than that of the first post.

Table 6.8 shows the distribution of these answers. The standard deviations are not widely different from the responses to the first group of questions in scale, though they do differ by question. The largest value (1.159), lower than the highest standard deviation of the first group of questions, was shared by the questions examining participants reactions, specifically replying to and voting on.

The lowest values (0.840 and 0.904 respectively), higher than the lowest standard deviations of the first group of questions, were in response to the likelihood participants would reply to this comment (the majority were in agreement that they would not) and judging whether it was considered coherent (on average, participants found it neither excessively clear or unclear).

Table 6.8: Distribution of answers given for the last question

Question	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
This comment is coherent/easy to understand	2.00	3.00	4.00	4.00	5.00	3.613	0.904
This comment contains (or appears to contain) credible information	1.00	2.00	3.00	3.00	5.00	2.613	0.973
This comment makes (or attempts to make) a persuasive argument	1.00	3.00	4.00	4.00	5.00	3.484	0.979
This comment is (or attempts to be) entertaining	1.00	2.00	2.00	3.00	4.00	2.452	0.910
This comment is (or attempts to be) offensive	1.00	3.50	4.00	4.00	5.00	3.742	1.015
Would you be more or less likely to reply to this comment than average?	1.00	1.50	3.00	4.00	4.00	2.548	1.159
Would you be more or less likely to share this comment (to friends/followers/etc.) than average?	1.00	1.00	2.00	2.50	4.00	1.935	0.840
Would you be more or less likely to up-/down-vote this comment than average?	1.00	1.50	2.00	3.00	5.00	2.452	1.159
Would you be more or less likely to report this comment than average?	1.00	1.00	2.00	3.00	4.00	2.129	0.907

Table 6.9: Mean rating for each question, compared with annotations present

	Mean Response to Question								
Annotation	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**
Information	3.475	2.756	3.196	2.678	2.556	2.322	2.045	2.497	1.986
Transition	3.750	2.600	2.825	2.650	2.575	2.525	2.025	2.450	1.900
Logical Attack	3.308	2.966	3.329	2.158	2.301	2.390	2.048	2.548	1.973
Logical Support	3.778	2.815	3.000	2.704	2.963	2.185	2.000	2.333	2.074
Rhetorical Attack	3.527	2.418	2.965	3.094	3.164	2.199	1.863	2.426	2.094
Rhetorical Support	3.580	2.547	2.685	3.420	2.309	2.271	2.122	2.530	1.972
Preference	3.000	2.000	3.500	3.500	3.000	2.000	2.000	2.000	2.500
Entity	3.511	2.427	2.886	3.280	2.853	2.238	2.010	2.463	2.042
Group	3.527	2.873	3.273	2.873	2.873	2.200	1.927	2.618	2.182
Audience	3.510	2.356	2.596	3.740	2.817	2.385	2.269	2.625	2.154
Implied Relationship	3.429	2.143	3.143	2.857	3.429	1.571	1.571	2.429	2.714
Implied Belief	3.800	2.333	3.000	2.967	3.333	2.067	1.800	2.667	2.333
Spam/Advertisement	1.000	1.000	1.000	1.000	1.000	1.000	1.000	4.000	5.000
Unknown	2.750	2.000	2.000	2.250	1.500	1.500	1.500	2.250	1.500
None	3.100	1.700	1.600	3.000	1.700	1.700	1.200	1.700	1.600

6.2.3 Question Breakdown

In this section, a summary of the responses to each of the questions is presented, compared against the annotations present on the post. Table 6.9 shows the mean Likert values for each question, and Table 6.10 shows the standard deviation from this mean. The full results are presented in Appendix D (Tables D.1-D.9). Note that as a post may have multiple annotations, there may be (and is likely to be) overlap in the number of responses.

TODO: TALK ABOUT WHY THESE NUMBERS ARE INTERESTING Discounting posts that received few responses (e.g. Preferences and Spam/Advertisement) it can be seen that there is a reasonable level of variation between participants ($\sigma > 1$). However, for when asked how likely they would be to share or report, participants were in closer agreement, in both cases stating they would be less likely to engage than average.

Table 6.10: Standard deviation from mean for each question, compared with annotations present

	Standard Deviation from Mean Response to Question								
Annotation	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**
Information	1.131	1.069	1.137	1.178	1.152	1.088	0.950	1.162	0.932
Transition	1.112	1.091	1.138	1.216	1.181	1.072	0.961	1.094	0.970
Logical Attack	1.191	1.036	1.211	1.090	1.088	1.161	1.016	1.188	0.958
Logical Support	0.737	1.020	1.089	0.974	1.261	0.862	0.903	0.903	0.979
Rhetorical Attack	1.107	1.043	1.160	1.221	1.141	1.062	0.906	1.190	0.996
Rhetorical Support	1.113	1.084	1.192	1.142	1.104	1.061	1.033	1.149	0.960
Preference	1.000	0.000	0.500	0.500	0.000	0.000	0.000	0.000	0.500
Entity	1.122	1.032	1.177	1.181	1.206	1.052	0.970	1.167	0.999
Group	1.126	1.113	1.242	1.207	1.192	1.051	0.912	1.168	1.011
Audience	1.109	1.028	1.043	0.971	1.116	1.059	1.058	1.145	0.948
Implied Relationship	0.728	0.639	1.245	0.833	1.178	0.728	0.728	1.498	1.385
Implied Belief	1.108	1.135	1.155	1.303	1.135	0.892	0.792	1.164	1.043
Spam/Advertisement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Unknown	1.479	1.000	1.000	0.829	0.866	0.866	0.866	1.299	0.866
None	1.578	1.100	0.917	1.483	0.900	1.100	0.600	1.100	1.020

Table 6.11: Average agreement with the statement *This comment is coherent/easy to understand*, grouped by Logic and Rhetoric

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Logic	1.00	2.00	4.00	4.00	5.00	3.374	1.150
Rhetoric	1.00	3.00	4.00	4.00	5.00	3.572	1.107

Table 6.12: Average agreement with the statement *This comment contains (or appears to contain) credible information*, grouped by Logic and Rhetoric

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Logic	1.00	2.00	3.00	4.00	5.00	2.959	1.028
Rhetoric	1.00	2.00	2.00	3.00	5.00	2.455	1.060

Table 6.13: Average agreement with the statement *This comment makes (or attempts to make) a persuasive argument*, grouped by Logic and Rhetoric

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Logic	1.00	2.00	4.00	4.00	5.00	3.298	1.189
Rhetoric	1.00	2.00	3.00	4.00	5.00	2.848	1.191

Table 6.14: Average agreement with the statement *This comment is (or attempts to be) entertaining*, grouped by Logic and Rhetoric

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Logic	1.00	1.00	2.00	3.00	5.00	2.228	1.087
Rhetoric	1.00	2.00	3.00	4.00	5.00	3.195	1.211

6.2.4 Logic/Rhetoric

This section, and Tables 6.11-6.19, examine how perception of arguments differ purely with regards to logical and rhetorical annotations (both attack and support). All other classifications are ignored for these tables.

Perhaps surprisingly, the majority of responses are very close, differing by a mean of <0.5. The largest difference was in response to whether the post was considered entertaining, with people considering rhetoric to be more entertaining by a margin of 0.967 (which was below the standard deviation). To determine if these observations can be explained by the spread of different types of argument *within* the umbrellas of logic and rhetoric, such as support and attack, these are considered in the next section.

Table 6.15: Average agreement with the statement *This comment is (or attempts to be) offensive*, grouped by Logic and Rhetoric

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Logic	1.00	1.50	2.00	3.00	5.00	2.404	1.137
Rhetoric	1.00	2.00	3.00	4.00	5.00	2.830	1.215

Table 6.16: Average response to the question *Would you be more or less likely to reply to this comment than average?*, grouped by Logic and Rhetoric

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Logic	1.00	1.00	2.00	3.00	5.00	2.368	1.123
Rhetoric	1.00	1.00	2.00	3.00	5.00	2.200	1.054

Table 6.17: Average response to the question *Would you be more or less likely to share this comment (to friends/followers/etc.) than average?*, grouped by Logic and Rhetoric

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Logic	1.00	1.00	2.00	3.00	5.00	2.047	1.002
Rhetoric	1.00	1.00	2.00	3.00	4.00	1.938	0.953

Table 6.18: Average response to the question *Would you be more or less likely to up-/down-vote this comment than average?*, grouped by Logic and Rhetoric

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Logic	1.00	1.50	3.00	3.00	5.00	2.520	1.151
Rhetoric	1.00	1.00	2.00	3.00	5.00	2.473	1.185

Table 6.19: Average response to the question *Would you be more or less likely to report this comment than average?*, grouped by Logic and Rhetoric

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Logic	1.00	1.00	2.00	3.00	5.00	1.994	0.964
Rhetoric	1.00	1.00	2.00	3.00	5.00	2.045	0.986

Table 6.20: Average agreement with the statement *This comment is coherent/easy to understand*, grouped by support and attack

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Support	**1.00**	**3.00**	**4.00**	**4.00**	**5.00**	**3.603**	**1.082**
Logical Support	2.00	3.50	4.00	4.00	5.00	3.778	0.737
Rhetorical Support	1.00	3.00	4.00	4.00	5.00	3.580	1.113
Attack	**1.00**	**2.00**	**4.00**	**4.00**	**5.00**	**3.445**	**1.140**
Logical Attack	1.00	2.00	4.00	4.00	5.00	3.308	1.191
Rhetorical Attack	1.00	3.00	4.00	4.00	5.00	3.527	1.107

Table 6.21: Average agreement with the statement *This comment contains (or appears to contain) credible information*, grouped by support and attack

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Support	**1.00**	**2.00**	**2.50**	**3.00**	**5.00**	**2.564**	**1.081**
Logical Support	1.00	2.00	3.00	3.50	5.00	2.815	1.020
Rhetorical Support	1.00	2.00	3.00	3.00	5.00	2.547	1.084
Attack	**1.00**	**2.00**	**3.00**	**3.00**	**5.00**	**2.613**	**1.074**
Logical Attack	1.00	2.00	3.00	4.00	5.00	2.966	1.036
Rhetorical Attack	1.00	2.00	2.00	3.00	5.00	2.418	1.043

6.2.5 Support/Attack

As noted in Section 6.2.4, there are different purposes for using logic or rhetoric that may account of the homogeneous results observed. By further breaking the answers down into different types of logic and rhetoric (specifically, support and attack) Tables 6.20-6.28 examine how perception varies further.

Once more, the majority of responses are relatively close, differing by a mean of <0.5. Again the exception to this was whether posts was considered entertaining and, to a lesser degree, offensive.

Supportive posts were considered to be more entertaining (by an average of 0.716) when using rhetorical devices rather than logical devices. They were also considered to be more offensive (by an average of 0.654) when using logical devices rather than rhetorical devices.

Attacking posts showed an even greater difference in opinion, with rhetorical posts being considered both more entertaining and more offensive (by a margin of 0.936 and 0.863 respectively) than logical posts.

Table 6.22: Average agreement with the statement *This comment makes (or attempts to make) a persuasive argument*, grouped by support and attack

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Support	**1.00**	**2.00**	**3.00**	**4.00**	**5.00**	**2.701**	**1.181**
Logical Support	1.00	2.00	3.00	4.00	4.00	3.000	1.089
Rhetorical Support	1.00	2.00	3.00	4.00	5.00	2.685	1.192
Attack	**1.00**	**2.00**	**3.00**	**4.00**	**5.00**	**3.082**	**1.201**
Logical Attack	1.00	2.00	4.00	4.00	5.00	3.329	1.211
Rhetorical Attack	1.00	2.00	3.00	4.00	5.00	2.965	1.160

Table 6.23: Average agreement with the statement *This comment is (or attempts to be) entertaining*, grouped by support and attack

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Support	**1.00**	**3.00**	**4.00**	**4.00**	**5.00**	**3.328**	**1.148**
Logical Support	1.00	2.00	3.00	3.00	5.00	2.704	0.974
Rhetorical Support	1.00	3.00	4.00	4.00	5.00	3.420	1.142
Attack	**1.00**	**2.00**	**3.00**	**4.00**	**5.00**	**2.753**	**1.257**
Logical Attack	1.00	1.00	2.00	3.00	5.00	2.158	1.090
Rhetorical Attack	1.00	2.00	3.00	4.00	5.00	3.094	1.221

Table 6.24: Average agreement with the statement *This comment is (or attempts to be) offensive*, grouped by support and attack

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Support	**1.00**	**1.00**	**2.00**	**3.00**	**5.00**	**2.363**	**1.127**
Logical Support	1.00	2.00	3.00	4.00	5.00	2.963	1.261
Rhetorical Support	1.00	1.00	2.00	3.00	5.00	2.309	1.104
Attack	**1.00**	**2.00**	**3.00**	**4.00**	**5.00**	**2.839**	**1.189**
Logical Attack	1.00	1.00	2.00	3.00	5.00	2.301	1.088
Rhetorical Attack	1.00	2.00	3.00	4.00	5.00	3.164	1.141

Table 6.25: Average response to the question *Would you be more or less likely to reply to this comment than average?*, grouped by support and attack

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Support	**1.00**	**1.00**	**2.00**	**3.00**	**5.00**	**2.265**	**1.038**
Logical Support	1.00	1.50	2.00	3.00	4.00	2.185	0.862
Rhetorical Support	1.00	1.00	2.00	3.00	5.00	2.271	1.061
Attack	**1.00**	**1.00**	**2.00**	**3.00**	**5.00**	**2.295**	**1.106**
Logical Attack	1.00	1.00	2.00	3.00	5.00	2.390	1.161
Rhetorical Attack	1.00	1.00	2.00	3.00	5.00	2.199	1.062

Table 6.26: Average response to the question *Would you be more or less likely to share this comment (to friends/followers/etc.) than average?*, grouped by support and attack

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Support	**1.00**	**1.00**	**2.00**	**3.00**	**4.00**	**2.108**	**1.019**
Logical Support	1.00	1.00	2.00	3.00	4.00	2.000	0.903
Rhetorical Support	1.00	1.00	2.00	3.00	4.00	2.122	1.033
Attack	**1.00**	**1.00**	**2.00**	**3.00**	**5.00**	**1.953**	**0.956**
Logical Attack	1.00	1.00	2.00	3.00	5.00	2.048	1.016
Rhetorical Attack	1.00	1.00	2.00	2.00	4.00	1.863	0.906

Table 6.27: Average response to the question *Would you be more or less likely to up-/down-vote this comment than average?*, grouped by support and attack

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Support	**1.00**	**2.00**	**3.00**	**3.00**	**5.00**	**2.505**	**1.122**
Logical Support	1.00	2.00	2.00	3.00	4.00	2.333	0.903
Rhetorical Support	1.00	2.00	3.00	3.00	5.00	2.530	1.149
Attack	**1.00**	**1.00**	**2.00**	**3.00**	**5.00**	**2.479**	**1.175**
Logical Attack	1.00	1.00	3.00	4.00	5.00	2.548	1.188
Rhetorical Attack	1.00	1.00	2.00	3.00	5.00	2.426	1.190

Table 6.28: Average response to the question *Would you be more or less likely to report this comment than average?*, grouped by support and attack

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Support	**1.00**	**1.00**	**2.00**	**3.00**	**5.00**	**1.975**	**0.957**
Logical Support	1.00	1.00	2.00	3.00	4.00	2.074	0.979
Rhetorical Support	1.00	1.00	2.00	3.00	5.00	1.972	0.960
Attack	**1.00**	**1.00**	**2.00**	**3.00**	**5.00**	**2.050**	**0.968**
Logical Attack	1.00	1.00	2.00	3.00	5.00	1.973	0.958
Rhetorical Attack	1.00	1.00	2.00	3.00	5.00	2.094	0.996

6.2.6 Rationale

Participants were provided a free-text area to optionally provide the reasons behind the choices they made. Below is a selection of these responses, their accompanying posts, and a discussion of what this means relating to the overall results noted above.

TODO: Coherent

Participants noted some of the features that they felt made an argument seem credible: either using direct quotes, or deliberately stating that the view was an opinion.

"Seems like a credible argument by using a quote"

"...they're talking about their own opinions so it is credible."

Interestingly, participants often remarked that posts they had answered *attempting* to persuade, did not strike them as particularly persuasive:

TODO: entertaining

Unsurprisingly, participants broadly felt that posts with foul language were offensive (although this was subjective), or those that directly insulted a person (whether within the discussion, or the topic of it), and often branded them as deliberate trolls. However, in certain cases, participants felt this would actually spur them to reply and engage with the discussion.

It's mildly offensive, but mostly it's just a bad, totally pointless joke, best ignored.

It's just swearing so not particularly offensive.

"I don't engage with racial hatred discussions. There's no rational discussion."

"The answer is trolling. Don't feed trolls."

"Essentially a trolling answer."

People are facing execution, and someone posts a dumb joke? It would be pretty funny in other contexts, but this is gross. I'd be more likely to reply just to call them out for being an ass.

Participants had different opinions on how emotional language would change their behaviour; one explained that they were more likely to reply to posts that didn't seem emotionally charged, whereas another felt the opposite.

"I liked the non-emotional tone. So I would comfortable replying. But because my emotions are not engaged, I am less inclined to share"

"It is emotionally engaging so prompts replying. It is entertaining that promots [sic] *sharing."*

There was also a relatively consistent consensus that participants were more likely to find a post persuasive, or vote for content, if they personally agreed with:

"The bias is: I am much more likely to share/upvote a comment if I agree with its contents."

"...Since I agree with the comment, I'm likely for me to vote up..."

"...I tend to upvote content that I agree with and share content I disagree with..."

As might be expected, participants were more likely to report posts that did not appear to be entering the discussion in good faith, whether through insults or derailing the topic.

"Baiting."

"...the respondent isn't likely to engage in polite debate."

"Appears to be spam"

Several of the rationales given justified the low engagement scores given (an average of <2 for replying, sharing, etc.) These were broadly in two camps: either due a general disinterest in the subject at hand, or due to the post being unclear or not credible.

"I don't really reply to comments on social media, but do often read them. Hence my 'neutral' more/less likely answers to these questions."

"I just don't care about politics."

"...I'm not particularly interested so I wouldn't be likely to engage them."

"Not clear the respondent's intention"

"Don't know how credible this information is, so I wouldn't interact with this comment"

Conversely, some participants explained their enthusiasm for interacting with certain comments particularly *because* of this.

"This is a stupid argument, so I'm likely to interact with it."

Others pointed out they were more likely to interact with posts that appeared to have a central conclusion that could actually be argued for or against.

"The comment has facts that can be argued for or against - so I'd be more likely to interact with this comment."

"I don't know a lot about the event but I would be more likely to respond to this as there is a clear point that could be discussed..."

6.2.7 Comparison to Existing Work

TODO: Comparisons

6.3 Summary

Due to a relatively high standard deviation, the results point to a degree of variation between participants answers. This is likely due to a combination of factors, in particular the individual variance of the posts (in terms of tone, implicit meaning, context, etc.) and the natural subjectivity with which people view argument. Despite this, the results suggest that rhetorical techniques are considered very similar to logical techniques in terms of general perception of argumentation, and are often considered to be more entertaining. This supports the hypothesis that rhetorical argumentation has its place in discussions on the social web, and is valuable to model.

Chapter 7

Conclusions and Future Work

7.1 Findings

The work described in this report covers an examination of the capability of current argumentation models, in particular the application of a combination of the AIF and SIOC ontologies to the social web, and the extension of these models to capture social and rhetorical information. Case-studies were carried out on three different areas of the social web to determine the strengths and weaknesses of modelling social, eristic argument on the web. This preliminary work indicated that existing techniques for modelling argumentation were insufficient to capture the structure and dynamic of argumentation taking place on the social web, which led to the publication of a paper in *the 14th workshop on Computational Models of Natural Argument*, detailing these omissions and proposing a set of augmentations to capture additional socio-rhetorical tactics (Blount et al., 2014). These extensions were implemented and trialled as part of an investigation re-examining the previous case-studies to determine the prevalence of rhetorical tactics in argumentation within areas of the social web and look for correlations that can be drawn between the use of these tactics and the machine-readable characteristic of the post such as length or readability. The results of this will published in the upcoming *ACM Conference on Hypertext and Social Media* (Blount et al., 2015a). These investigations reveal the following findings.

Firstly, and most importantly, rhetorical tactics are shown to be present throughout the argumentation in the case studies, even when only accounting for a small subset of rhetorical argumentation. Clearly, failure to accurately model these social argumentation strategies is detrimental to the goal of studying how discussions evolve on the social web. Secondly, in the three use cases, rhetorical tactics are most often used by either those contributing the most to the discussion overall, or by those who do not contribute logically at all. Whether this effect is related to a participant's engagement is unknown. However, this raises the possibility that there is a tipping-point in a dialectic logical debate where participants feel the need to expand their use of tactics; alternatively, these users simply interleave both types of tactics throughout their arguments$_2$.

Finally, while the features of the argumentation structure above are challenging to detect automatically and expensive to manually annotate, the markers present in the social media sphere are relatively trivial to detect, and some correlations between the two can be observed.

The primary limitation of this work is the necessity to manually annotate all the data. This is time consuming and subjective, but as yet there is no way to circumvent this process and automatically extract premises and conclusions. A further constraint is that only English-language sites are examined. There are, of course, many other social media services that cater to audiences of different languages, such as *Renren*[1] for China or *VKontakte*[2] for eastern Europe. However, this separation is mitigated by the fact that different languages (and different cultures) have their own rhetorical structures and argumentation schemes (Van Eemeren and Grootendorst, 2004, p. 21). As a result, attempting to analyse multiple sites with different primary languages concurrently would distort any patterns that might emerge in the argument structure of the users.

7.1.1 Hypothesis and Research Questions

Revisiting the hypothesis initially proposed in Section 1.2:

"A model of eristic argumentation on the social web should include both logical and rhetorical tactics, as the inclusion of rhetorical techniques affects the way in which users perceive and engage with the argument"

This was resolved into three distinct research questions:

1. *Are current frameworks and tools sufficient to model eristic argumentation on the social web?*
2. *Is modelling eristic argumentation valuable?*
3. *Which rhetorical techniques should be included in a model of eristic argumentation on the social web?*
4. *Do rhetorical techniques affect the way in which users perceive and engage with the argument?*

Based on the proceeding body of work, these questions can now effectively be answered as follows:

TODO: The first question

TODO: The second question

TODO: The third question

TODO: The final question

[1] http://renren.com/
[2] http://vk.com/

7.2 Proposals for Future Work

Based on the investigations that have been carried out in this thesis, and the findings summarised in Section 7.1, these are the particular avenues of future work that could be approached, using this extended model of social argumentation at their core.

7.2.1 Further refinement/review of ASWO

TODO: Further refinement/review of ASWO The development of the ASWO has been, and should continue to be, an evolving process. Further refinement and expert review will This includes returning to the proposals laid out in Section **??**, which discusses other aspects of social argumentation that require additional efforts to model, including the notion of social meta-data such as up-/down-votes.

7.2.2 Social Media Features

TODO: Perception of reputation systems (likes, retweets etc.)

7.2.3 Participant Presentation

TODO: How participants present themselves - avatars, bios, (followers?) ("The Twitter Egg with 7 followers vs., say, Stephen Fry) etc. Does this have an impact?

7.2.4 Further refinement/review of ASWO

TODO: Multi-comment/overall thread perceptions?

7.2.5 Crowdsourcing

TODO: Workshop experiment; categorisation/classification of argument tactics; instructed non-experts vs trained non-experts (vs experts)

Firstly, as is the focus of many researchers in this field, attention can be given to the use of artificial intelligence and argumentation, whether by reasoning over a model of argument in an attempt to determine the most valid argument and subsequent course of action (Caminada and Amgoud, 2007) or by using the model to influence the techniques and strategies of intelligent agents involved in dialogue games (Reed et al., 2008). However, the fact that the eristic features of the model are unlikely to be practical (or appropriate) for the use of reasoning, or governing

inter-agent negotiations is likely what has caused them to be currently excluded from the majority of formal models. Disregarding this, the weakness of this approach is that the model cannot, at this stage, be automatically constructed, but must be created through a time and labour intensive process of manual annotation. Therefore, using the model as a basis of reasoning over argumentation in general is ultimately flawed. Any gains that were achieved in this area would be rendered moot by the cost of creating a model for every argumentation to be reasoned over, and rendered impractical on a web-scale.

With this in mind, the second avenue would be to generate this model from the arguments$_2$ themselves, by means of natural language processing (Palau and Moens, 2009), the use of social machines (Hendler and Berners-Lee, 2010) or some combination thereof. This would go some way towards solving a large outstanding issue in the field (Schneider et al., 2013, p. 31-32). While working towards a means of automatically generating the model has potential, it is likely that the social and eristic nature of the arguments to be modelled is the very thing that hinders this approach. Web-based culture and language is made up of many disparate groups, and continues to rapidly and constantly evolve, which renders current natural language processing impractical in the short term and ineffective in the long term, without the use of domain-specific normalisation techniques that are expensive or inaccurate (Han and Baldwin, 2011; Eisenstein, 2013). While the findings in Section 4.2.2 point towards a means of broadly classifying a post as containing different types of logical or rhetorical elements, with reasonable probability, the overall structure may be difficult to model automatically. Clearly, at this stage, human input cannot be wholly eliminated. However, with the use of crowd-sourcing or social machines, the large effort cost of annotating arguments$_2$ could be distributed across participants to a manageable level.

Finally, emphasis could be placed on the social aspect of argument. Because argumentation is a social process conducted by people, it is important to recognise the fact that individuals may perceive the same argument$_2$ in many different ways due to cultural beliefs (Suzuki, 2011), pre-existing cognitive biases (Arceneaux, 2012), as well as features surrounding the content of the argument$_1$ such as avatars (Lee and Shin, 2014). The advantage of this approach is that it uses the existing model as a platform for experimentally evaluating how the use and prevalence of different argumentation tactics affect users' perceptions of an argument$_2$, and the way in which they engage with the thread (and one another) as a result. By using the model as a tool for analysing individual case studies, the requirements for creating and annotating the necessary argumentation structures are greatly constrained, while allowing the findings to be used in further work in the research area. This contribution to the field can then be used to assist further work in a number of other areas, such as another metric for use with adaptive recommendation techniques to match people based on preferred argumentation strategies (Guy et al., 2010), or the development of argumentation frameworks that integrate with the social web (Torroni et al., 2010).

7.3 Conclusions

Argumentation, like the social web itself, is a diverse construct that is challenging to model but has huge potential if correctly harnessed. Rhetoric and logic are both important aspects of online social argumentation; to accurately model how arguments occur and evolve across social media it is important to take into account all the techniques and tactics that are employed. While it is difficult to determine the value of a contribution, to define all logical contributions (and only logical contributions) as valuable is a naive approach. Being able to accurately record all aspects of argumentation on social media is the first step towards being able to accurately analyse informal argument on an enormous scale. The work presented in this report provides a novel framework for modelling a subset of rhetorical argumentation, ideal for use in modelling social argumentation, and demonstrates some of the structures that may be observed when applied to three case studies. Bringing rhetorical and logical models of argumentation together with the computational modelling of social media argumentation has the potential to be a powerful tool in both our understanding of social media use and social argumentation. This raises the prospects for the development of new tools that could help communities manage argumentation, and counter diverse problems, from echo-chambers and groupthink to trolling and anti-social behaviour.

Appendix A

Expert Information Sheet

The following is a reproduction of the information sheet provided to experts conducting the review in Chapter **??**.

A.1 Proposal

This work aims to extend the current methods for modelling web based argument to take into account additional social features and differentiating between "logical" argument that focuses on (purported) facts and "rhetorical" argument that focuses on influencing the perception of participants in the eyes of the audience. This hopes to make the modelling of "eristic" argument (argument for the sake of argument) more complete, clear and consistent.

A.2 Existing Models

A.2.1 Argument Interchange Format

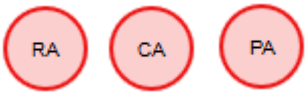
The Argument Interchange Format (AIF) is a framework for representing argumentation as a directed graph (Chesñevar et al., 2006), modelling information "nodes" and the relationships (such as inference or conflict) between them. In their work on an extension to the AIF, dubbed AIF+, Reed et al. differentiate between these logical relations and the actual words spoken during the debate (Reed et al., 2008). Table A.1 shows an overview of these nodes and how they are used in the AIF(+).

A.2.2 Semantically Interlinked Online Communities

The Semantically Interlinked Online Communities project (SIOC), a semantic-web vocabulary for representation social media, aims to enable the cross-platform, cross-service representation

of data from the social web (Breslin et al., 2006). This allows for semantic representations of Sites, which hold Forums, which contain Posts, authored by a UserAccount (explicitly *not* a person, as a person can own and manage more than one UserAccount). Table A.1 shows an overview of the nodes used in SIOC.

Table A.1: Description of nodes in model

Name	Description	Node	
I-node	**Information** nodes represent a (purported) piece of information, data, or claim		AIF
S-nodes (RA-, CA-, PA-nodes)	**Scheme** nodes denote a logical connection between I-nodes, respectively an **inference**, a **conflict**, or a **value preference**		AIF
YA-node	**Illocutionary anchor** nodes tie the information and logical structure of an argument with the spoken or written locution		AIF+
L-node	**Locution** nodes represent the actual words that are spoken or written by participants		AIF+
TA-node	**Transition** nodes represent links between locutions. **Note:** this is adapted by the ASWO to denote transitions between locutions that do not add information nodes, but still further the debate (such as prompting for more details, evidence, etc.)		AIF+
U-node	**User-account** nodes denote the account the user uses to contribute		SIOC

A.2.3 Examples

A.2.3.1 Syllogism

A syllogism is an example of reasoning in which two premises are used to draw a conclusion. Figure A.1 shows a syllogism of the form *"All men are mortal. Socrates is a man. Therefore Socrates is mortal"*.

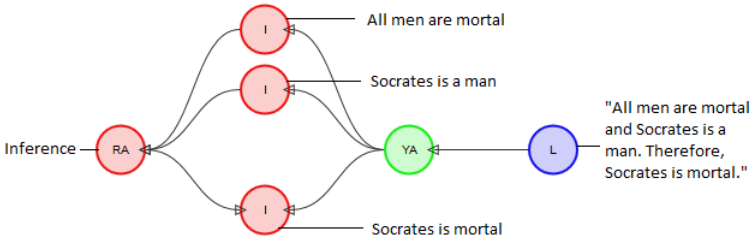


Figure A.1: Example of a syllogism: *"All men are mortal. Socrates is a man. Therefore Socrates is mortal"*

A.2.4 Exercise 1

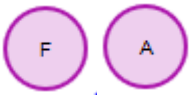
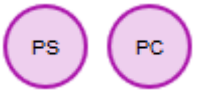
Please read the following sample arguments and describe (aloud, if you are being interviewed face-to-face) how you would model them using the AIF(+) and SIOC. You may find sketching them on a piece of paper useful. If you are feel unsure of how to model all or part of one of these samples, move on to the next part.

1.
   - **User 1:** *The tech industry is often biased against women*
   - **User 2:** *@User1 You would say that, you're a woman*
   - **User 3:** *@User1 **** off and die you ****ing nazi before I come and **** you up*
2.
   - **User 1:** *Guns killed 33,000 people last year, they need to be banned*
   - **User 2:** *@User1 And a lot of those were minors*
   - **User 3:** *@User2 According to who?*
3.
   - **User 1:** *What does Barack Obama call illegal aliens? Undocumented democrats!*
   - **User 2:** *@User1 You're so stupid you probably went to the library to find Facebook*

A.3 Argumentation on the Social Web Ontology

The principal features from the AIF and SIOC ontologies are combined alongside the means to model rhetorical tactics in the Argumentation on the Social Web Ontology (ASWO). The principal focus here is the inclusion of the social impact of arguments made and the use of rhetorical support and attack (Blount et al., 2014, 2015a). Table 4.4 shows an overview of the additional nodes used to model social impact.

Table A.2: Description of nodes added to the model

Name	Description	Node
P-node	**Persona** nodes denote a person's social "character" that they assume during a discussion	
F- and A-nodes	**Faction** and **Audience** nodes represent groups of personas	
PS-, PC-nodes	**Personal Support** and **Personal Conflict** nodes support/attack personas or groups rather than pieces of information	
Im-node	**Implication** nodes imply a relationship that may or may not exist. Can be combined with a PS- or PC-node to denote positive or negative implication	

ASWO

A.3.1 Examples

A.3.1.1 *Ad hominem*

Ad hominem ("to the man") arguments attack a person's character, without attacking their argument. However, they can be a viable tactic in rhetorical debate and can introduce both new I-, CA- and PC-nodes to the structure when modelled.

Figure A.2 shows a "reasonable" *ad hominem* argument (Walton, 1987), such as *"You don't have any qualifications in that area, don't make such broad statements"*

Figure A.3 shows a more aggressive tactic that disparages someone's argument and them as a person, such as *"They're an idiot, don't listen to them"*

Figure A.4 shows an abusive argument that contains no information, instead attacking the person directly and trying to shut them out of the debate, for example *"**** off and die!"*

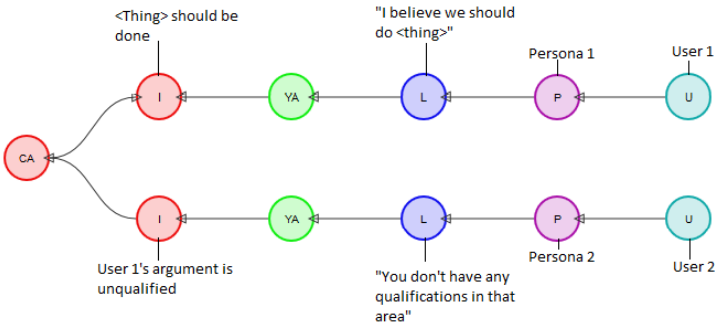


Figure A.2: Example of *ad hominem*

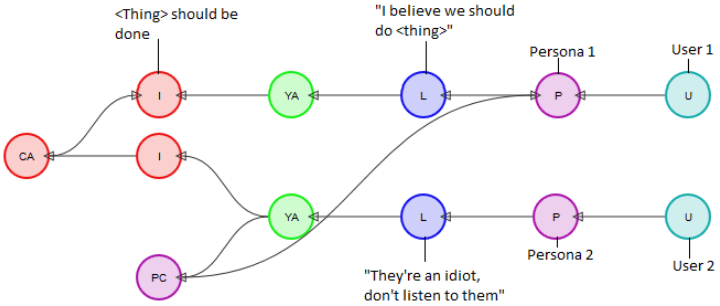


Figure A.3: Example of *ad hominem*

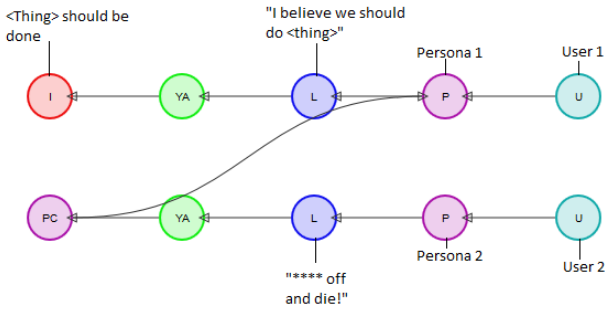


Figure A.4: Example of *ad hominem*

A.3.1.2 Appeal to Consensus

Appeal to consensus is the fallacy that because a claim is popular or widely-held, it is true. An example of this can be shown in Figure A.5.

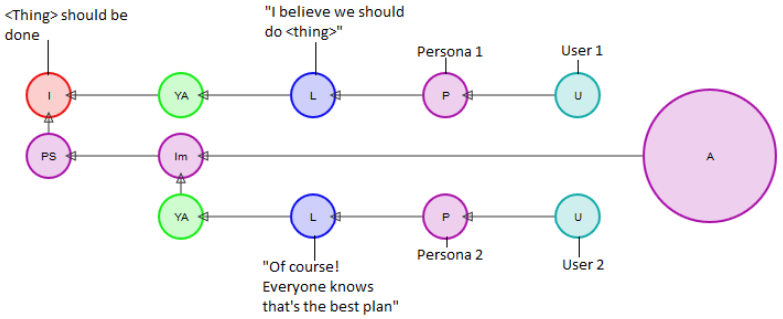


Figure A.5: Example of Appeal to Consensus

A.3.1.3 Association Fallacy

The association fallacy is the notion that because a person is associated with, or shares the views of, an undesirable group, their claims are wrong. An example of this can be shown in Figure A.6.

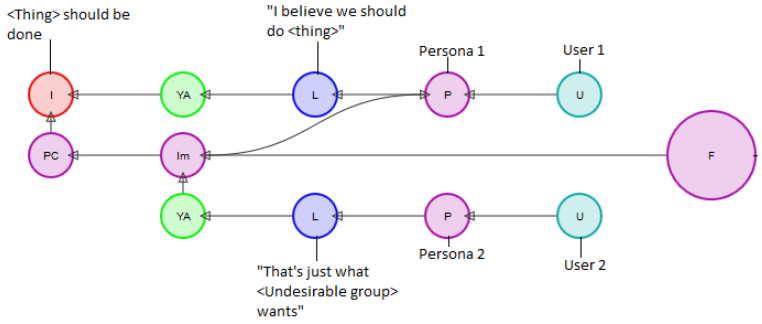


Figure A.6: Example of the association fallacy

A.3.1.4 Appeal to Humour

Appeal to humour is a technique by which a participant in the debate attempts to ingratiate themselves with their audience by making a joke about the situation as shown in A.7. This can be coupled with an *ad hominem* attack when the joke is made at someone else's expense.

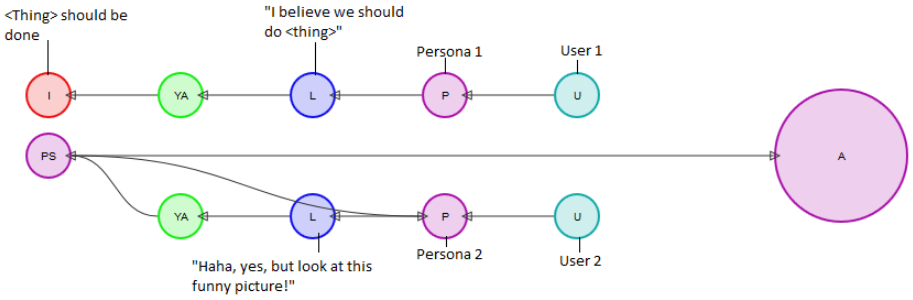


Figure A.7: Example of Appeal to Humour in the model

A.3.2 Exercise 2

Please read the following sample arguments and describe (aloud, if you are being interviewed face-to-face) how you would model them using the additional nodes added by the AWSO. You may find sketching them on a piece of paper useful. If you are feel unsure of how to model all or part of one of these samples, move on to the next part.

1.
   - **User 1:** *The tech industry is often biased against women*
   - **User 2:** *@User1 You would say that, you're a woman*
   - **User 3:** *@User1 **** off and die you ****ing nazi before I come and **** you up*
2.
   - **User 1:** *Guns killed 33,000 people last year, they need to be banned*
   - **User 2:** *@User1 And a lot of those were minors*
   - **User 3:** *@User2 According to who?*
3.
   - **User 1:** *What does Barack Obama call illegal aliens? Undocumented democrats!*
   - **User 2:** *@User1 You're so stupid you probably went to the library to find Facebook*

A.4 Questions

1. Why do you feel social argumentation is, or is not, important to model?
2. What, in your opinion, are the challenges of modelling social argument?
3. Are threatening and/or abusive comments something that should be considered social argumentation? If not, where should the line be drawn?
4. If yes, how do you feel these threatening and/or abusive comments should be included?
5. To what extent did the ASWO capture different elements of argumentation? What do you feel is missing?
6. Were there parts of the ASWO you felt were unclear? In what way?
7. Do you feel the ASWO is consistent with the AIF?
8. Do you feel the ASWO is internally consistent?
9. If two people were to separately model the same argument using the ASWO, do you think they would achieve the same result? Do you feel this is important?
10. Do you have any other comments about the implementation of this model?

Appendix B

Social Media Post Feature Distributions

B.1 Number of Comments

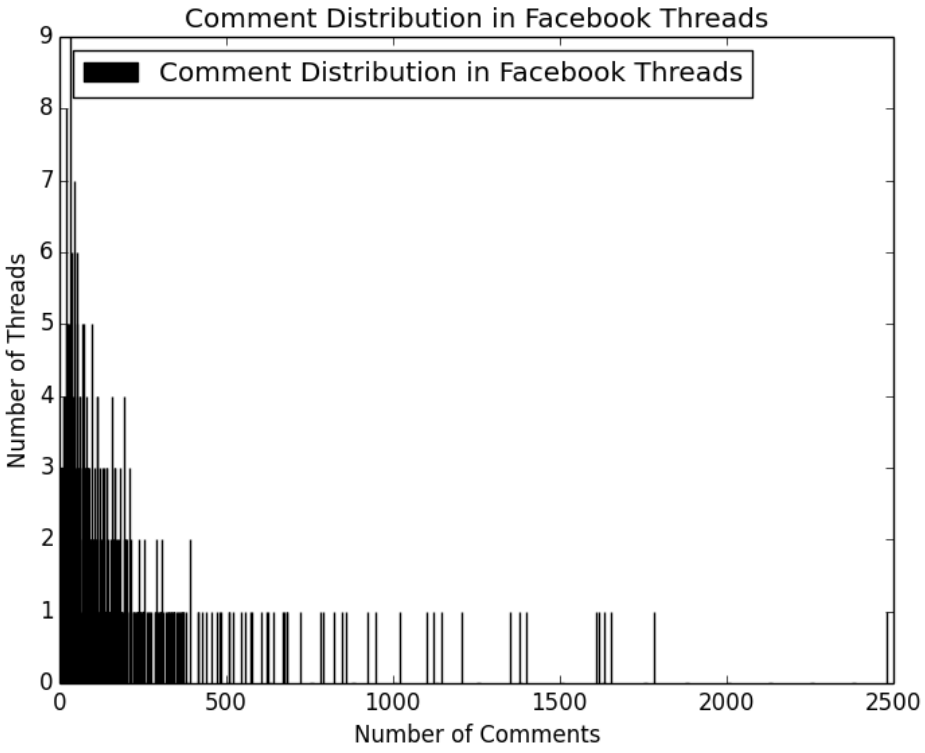


Figure B.1: Number of comments per thread on Facebook

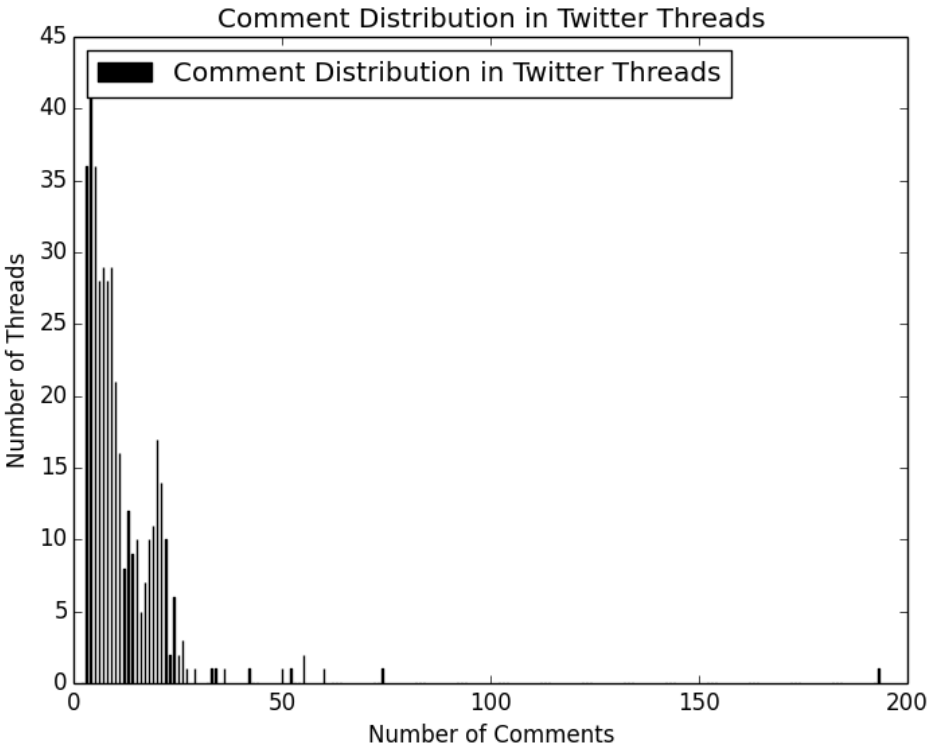


Figure B.2: Number of comments per thread on Twitter

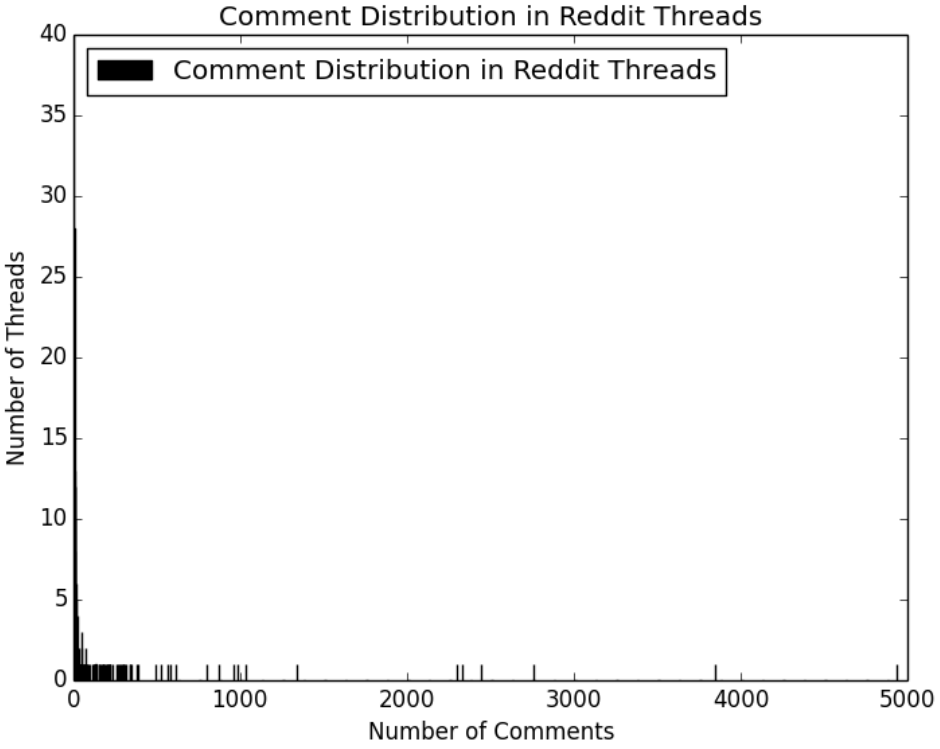


Figure B.3: Number of comments per thread on Reddit

B.2 Length of Comments

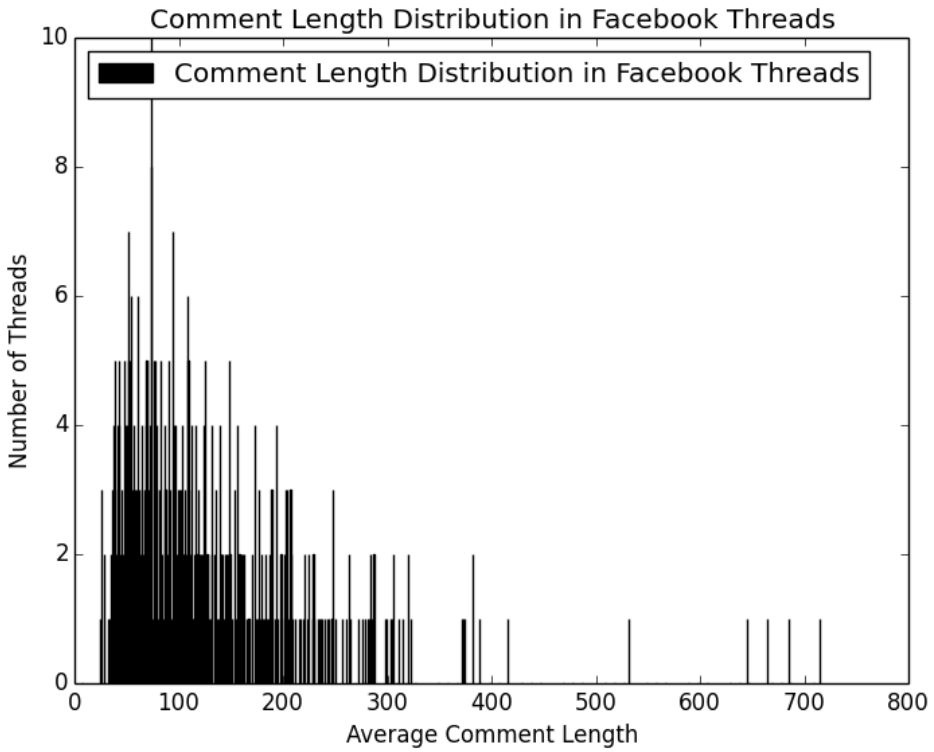


Figure B.4: Average length of comments per thread on Facebook

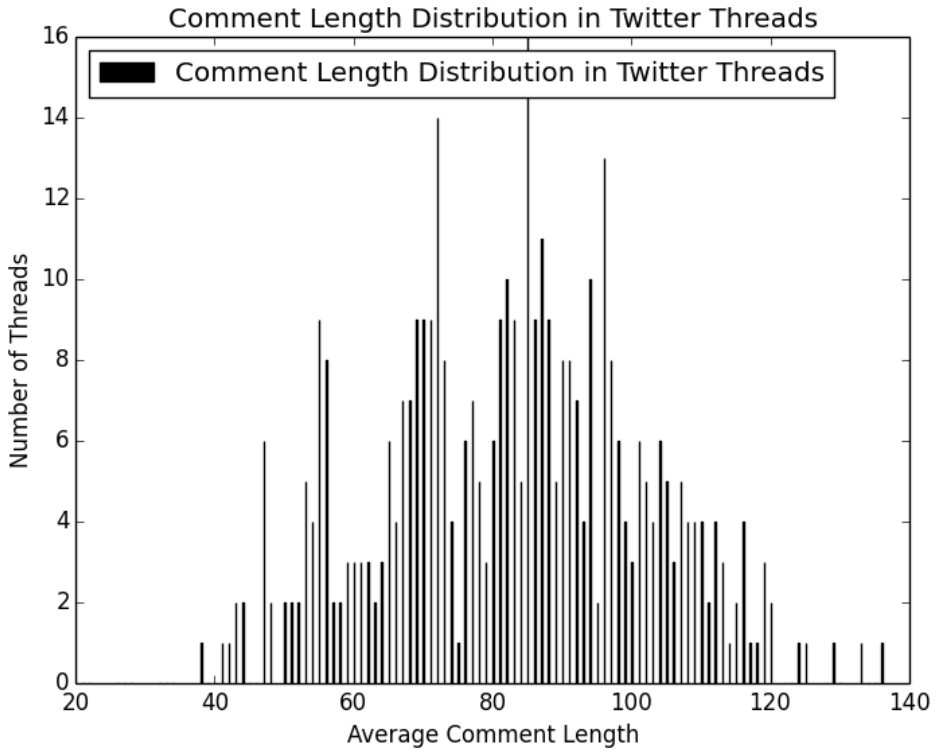


Figure B.5: Average length of comments per thread on Twitter

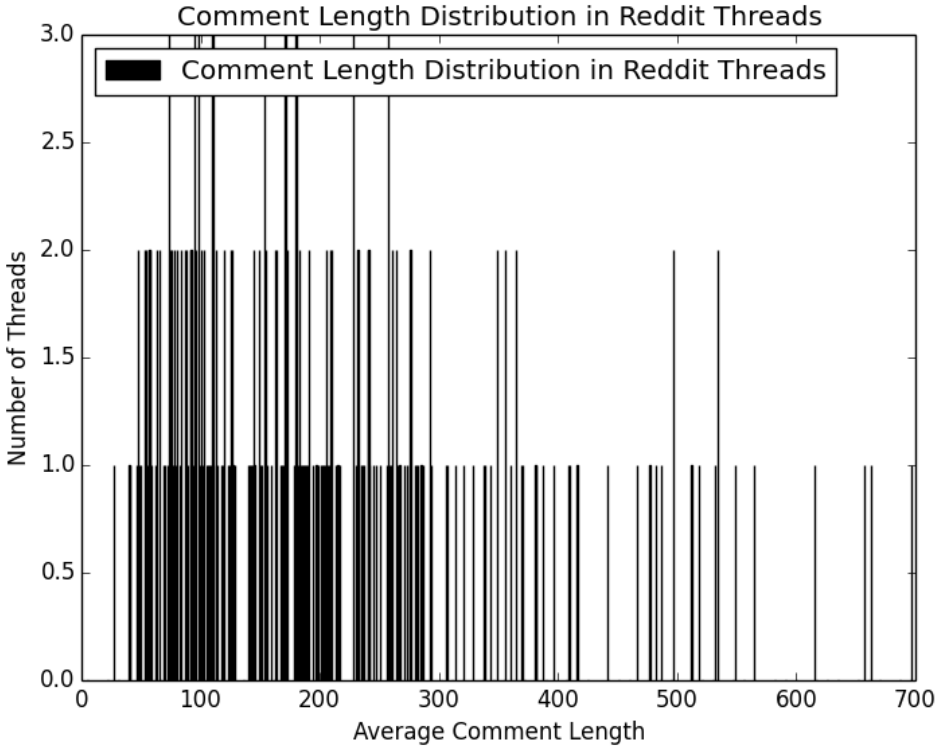


Figure B.6: Average length of comments per thread on Reddit

B.3 Comments per User

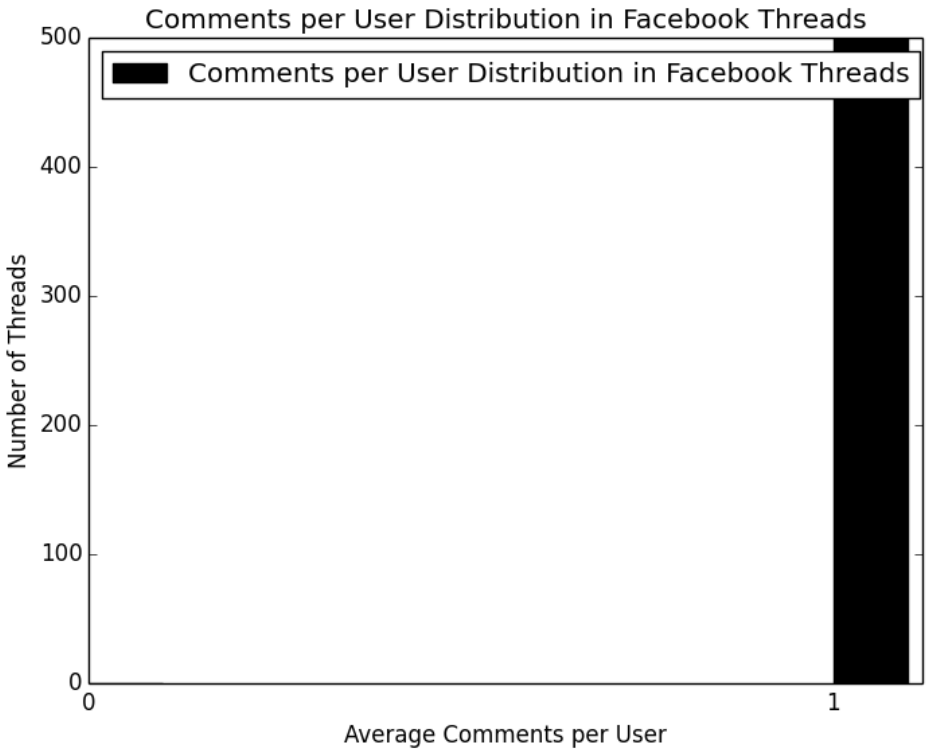


Figure B.7: Average comments per user per thread on Facebook

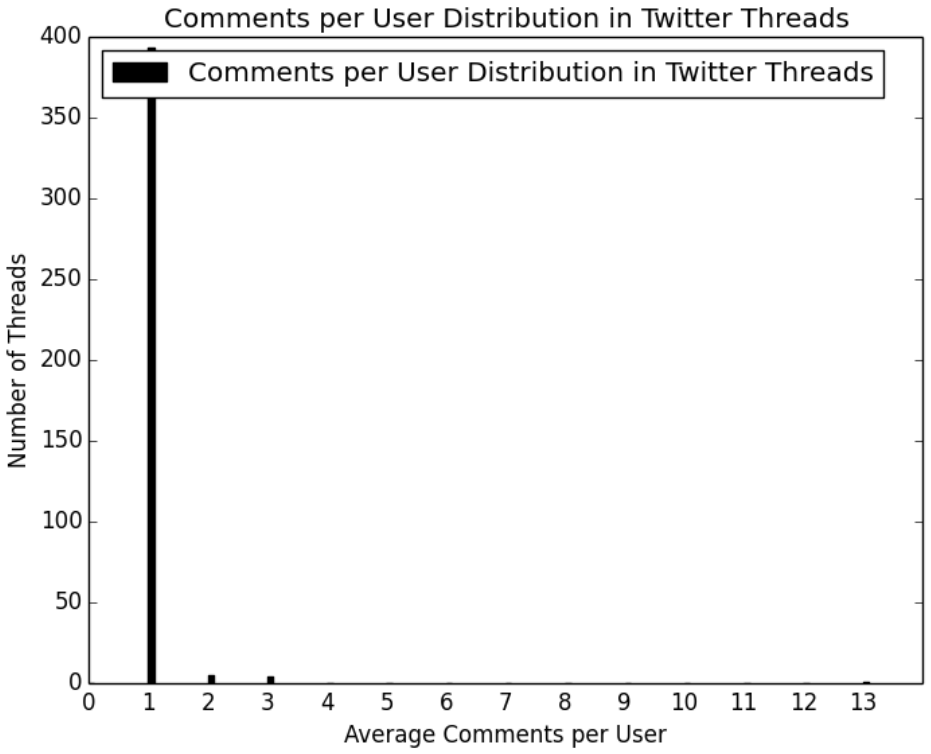


Figure B.8: Average comments per user per thread on Twitter

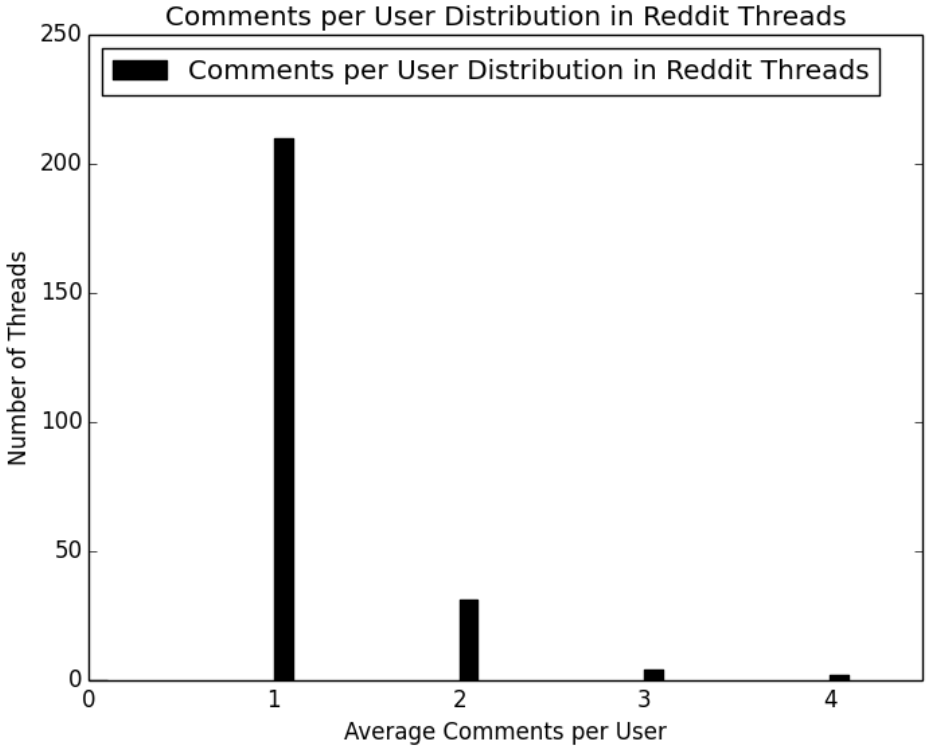


Figure B.9: Average comments per user per thread on Reddit

B.4 Replies within Thread

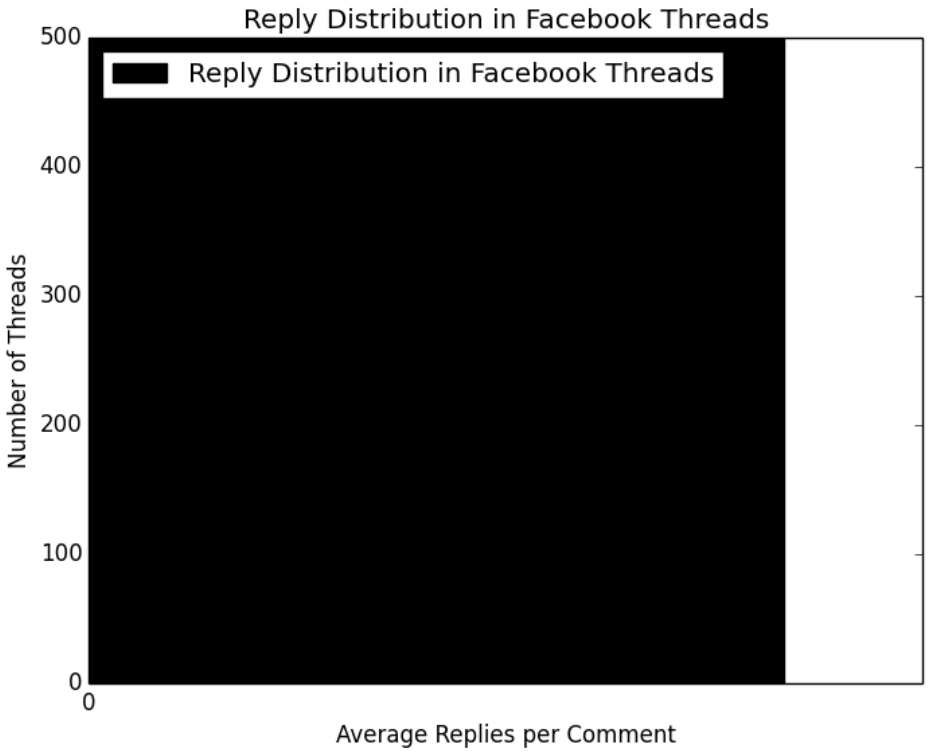


Figure B.10: Internal replies per thread on Facebook

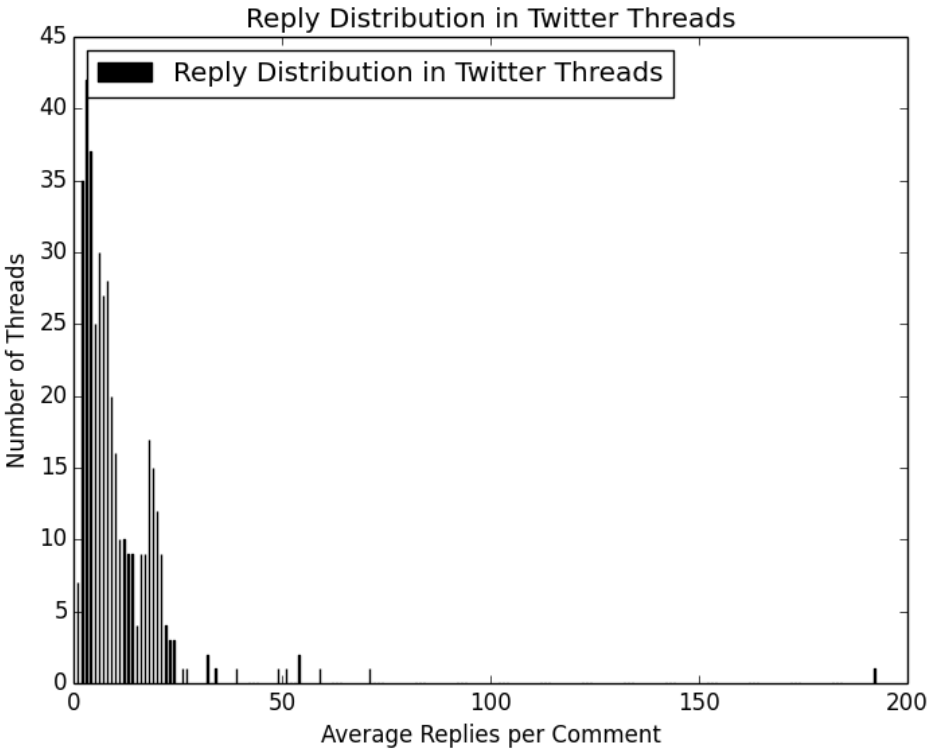


Figure B.11: Internal replies per thread on Twitter

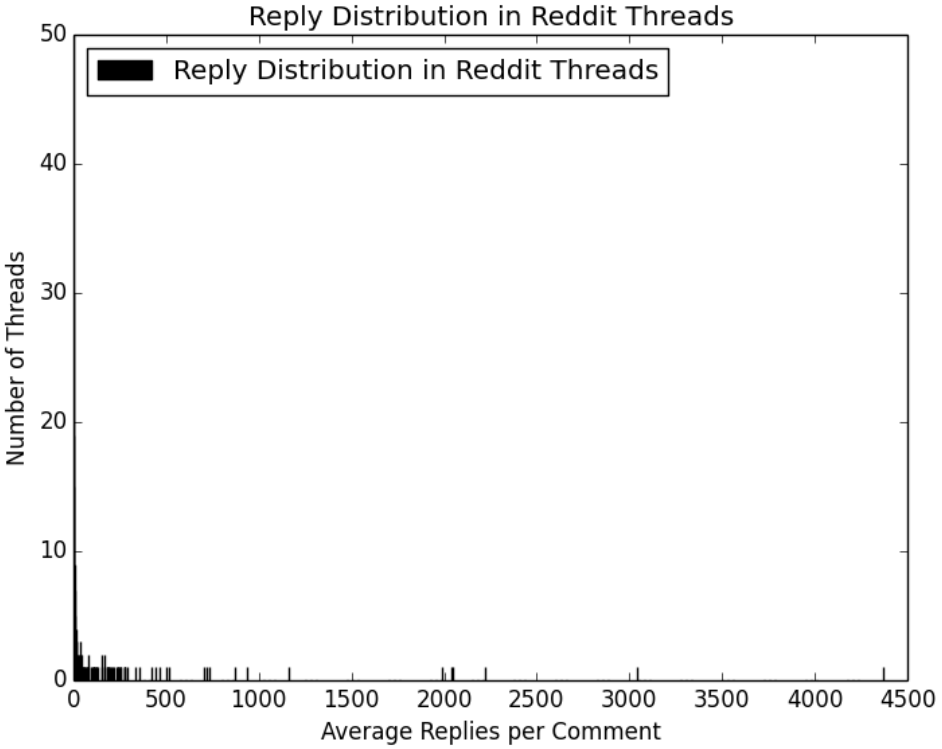


Figure B.12: Internal replies per thread on Reddit

Appendix C

Sample of Social Media Threads

C.1 Facebook

05:12 24/02/16

US election 2016: Trump wins Nevada – Strengthening his position in the Republican presidential race.

More: http://bbc.in/1Qbfb0J #NVCaucus

05:13 24/02/16

Crap

05:13 24/02/16

Oooops

05:13 24/02/16

No sevens on this win. Nothing but a bunch of blanks and no payoff. Stupid is as stupid does for those votes, but Cruz and the others aren't any good either.

05:14 24/02/16

The reason I will not vote for TRUMP is because he is too much like ME and I know how dangerous I would be if I was President. Trump appeals to everything that I am, that is Bad . When I hear him speaking for most of what he says its like hes speaking whats in my head and when i am angry there is a lot going on in my head that if I acted on would hurt a lot of people.

I'm trying to Change that part of me and I am trying to hold back those emotional responses. If Trump is President he will release and encourage every bad thing in me. He is like the figurative devil on my shoulders, imagine voting for and electing that little small voice.

Donald Trump is the embodiment of every negative trait and character flaw that I and his supporters have. He is a freaking mirror of all our Character flaws and everything that's bad about us that needs to Change. Unfortunate for America Donald Trump and Ted CRUZ are going to be the next Administrative leaders Ted might very well become the figurative good Angel on our shoulder. Can you imagine what that would look like. I can see it and it actually scares me.

Trump speaks to every negative trait in me. He appeals to my anger and everything in me that's negative. If he becomes president he will represent every weak flaw in me that I am trying so , so very hard to change. Voting for Trump would be the most irresponsible thing I could ever do.

Just because Donald says what most of us who like him think, does not justify voting for him. The only good thing about Trump is that he is not a Politician. He is not apart of the good Ol' boys club. Other than that there is not too much left. My Educated opinion is Trump will only make the situation worse, as would anyone who makes decisions based on Anger. Do we need a leader like that? Will that really make America Great Again?

Trump by his folly will only strengthen and empower an enemy that already is blind by there own fury and there own anger there own leaders who speak to the worst parts of them. An enemy that is blinded to how they are being used and manipulated by there own emotional manipulators. When will it ever stop. We need a leader that can answer that Question and actually Implement a plan that can bring peace to everyone involved.

Donald Trump is going to be the next President and I guarantee that within 6 months of him being in office EVERYONE that voted for him will sorrowfully regret having done so. Only then will you realize how irresponsible it is to respond in anger to this very messed up situation. And by then it will be too freaking late.

I might be wrong about Ted Cruz....

05:15 24/02/16

Acho que vou come ar a acreditar nas testemunhas de jeov , o fim do mundo aproxima-se!

05:15 24/02/16

Interesting times we live in. I'd really like to see Trump and Sanders win their respective party's nomination. I think they might both force our two political parties to reform and produce better candidates. It'd be nice to see them shake up DC too, they're both political outsiders and it seems most establishment politicians aren't very fond of either of them.

05:15 24/02/16

Say 'NO' to Trump Sheeples

05:16 24/02/16

> Get ready world for American refugees to begin flooding Europe and the rest of the world. That's if we will even be allowed to leave with his giant wall and all.

05:17 24/02/16

> Really Trump on his way to having his finger on nukes . . . not funny.

05:17 24/02/16

> Yes to Trump is no to the NWO!

05:19 24/02/16

> Does he ever button the bottom of his suit coats or sport coats ?? Can he ??

05:19 24/02/16

> Americans proved They're baap of all racist

05:19 24/02/16

> Right on!!

05:19 24/02/16

> Racist chalk up another win.

05:19 24/02/16

> king of liar

05:20 24/02/16

> Trump is not a Republican, just like Bernie is not a Democrat.

05:20 24/02/16

> Urghhhh... Another trumping post

05:21 24/02/16

> 'Trump the dumb' is the kind of person i lose control over my sanity whenever i come across. Humanity is being trampled upon where Trump the Dumb is.....

05:24 24/02/16

> Please spare a thought for the rest of us, America....It's like the world's crappiest comic just scored 7 days with the world's crappiest agent, and with six more pub gigs to go, he's already searching around for the steering wheel that drives Airforce one....(good news... the heat's shifted away from a relieved Putin, the world's second crappiest comic)

05:24 24/02/16

> https://www.facebook.com/inthenowrt/videos/578195305664176

05:25 24/02/16

> lol, it means haters hate him only on FB.

05:25 24/02/16

> Trump is winning evangelicals, moderates, northeasterners, southerners, westerners and his rival democrats are still attacking each other. Barring something completely unforeseeable, Trump will be the next nominee lol

---

05:27 24/02/16

> America is going to hell in a gasoline soaked hand basket!

05:30 24/02/16

> Buba Vanga predicted that Obama will be the last president of the US after him its going to fall, so Trump will become president and he will run the US down into the ground.

05:30 24/02/16

> All nasty noise and tasteless theater no positive substance but he appeals to the ugly emotions of those who flock to an authoritarian figure who fuels the flames of their hate, fear, and vulgarity.

05:32 24/02/16

> America will suffer for another 8 wasted years!!!! What is wrong with people???? He's our GOP Obama only worse!!!

05:33 24/02/16

> When I heard Trump was running, I thought it was all a big joke. When I listen to him speak, I think OMG, this man in nuts, then he keeps winning these states, now I think there is lead in all the drinking water in this country because Americans have lost their minds. This will be the fall of America. What fools.

05:33 24/02/16

Stefano Fiore he's slowly on the rise mate

05:34 24/02/16

Republians will fail if they nominate Trump as their candidate.

05:34 24/02/16

What a tool

05:35 24/02/16

trump will win and it proves most of america is uncivilized

05:35 24/02/16

online mobile bussiness
work from home
zero investment
100% legal bussiness
100% pure income
work on fb & whatsapp only
work only 30 minuts in a day
instant withdrawal in your account
earn monthly 15,000 to 20,000
for this bussiness you need only smartphone & Net

digital india .....
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Join WhatsApp no. 9088069580 ł send
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05:36 24/02/16

http://www.nationalreview.com/article/431694/donald-trump-global-bully

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05:38 24/02/16

Never trust a political aspirant whose tie tip reaches his dick.

05:39 24/02/16

Awful news

05:39 24/02/16

Venessa Thor

05:40 24/02/16

https://www.facebook.com/czech.WeAreHereAtHome/videos/1532678907033072/?pnref=stor

---

05:42 24/02/16

USA is going down.....

05:43 24/02/16

I'm ashamed to live is this country....

05:46 24/02/16

Soon jolly ol England will have to reclaim these colonies

05:47 24/02/16

I HAVE UNFOLLOWWED CNN COZ THEY POST 24*7 about DONALD DUCK TRUMPSHIT

05:47 24/02/16

You just ran a article on BBC 24, around 15 minutes ago, regarding Apple fighting the FBI over the court ruling to unblock the iPhone of the killer Syed Rizwan Farook. The article makes a terribly gaffe in it. It shows a clip of Mark Zuckerburg speaking on this subject, but a caption came up underneath stating' Donald Trump – Facebook CEO'. It then immediately shows a clip of Donald Trump speaking on this subject, correctly captioned as 'Donald Trump – Republican Presidential Candidate'. It is bad enough that Mr Trump is having success in his bid, as I consider some of his comments at times to be ugly, unwanted and crass. But to now having top news agencies make glaring blunders in editing their articles and mistakenly give Mr Trump credit for being CEO of Facebook, really takes the biscuit!

05:48 24/02/16

Am just following from a distance!

05:49 24/02/16

Are US people going to follow India??? Electing Trump is same as P.M MOODI an extremist.....hats off another extremist

---

05:50 24/02/16

OMG I can't believe it

05:52 24/02/16

Noooooooo. We are better than this.....

05:57 24/02/16

@Tommy please can we swap country...?

05:57 24/02/16

Mein trump, an American neo–Nazi's rise through opposition and hardship.

06:00 24/02/16

The Democrats are cross fingers to hope Teump being the head of Republican .. so they will win the final presidancial elecrion in November. .

06:02 24/02/16

Be vewy vewy afwaid.

06:05 24/02/16

trump is nothing but the right choice,the messiah to make us great again,he will make Americans proud to be americans

---

06:07 24/02/16

America z responsible state trump z not eligible for president be aware American .

06:08 24/02/16

More and more, my fellow Americans prove how incredibly STUPID they truly are.

06:10 24/02/16

I hope trump wins so America will finally get the final war it so craves and burn

---

06:12 24/02/16

http://youtu.be/1iDRu2q2cRw

06:13 24/02/16

Hahahha pipo actually voted for this man wow..intresting

06:16 24/02/16

TRUMP for President ! (Better than the muslim traitor and his terrorist friends CAIR that they have suffered for so long)

06:17 24/02/16

He d candidate 2 beat at the final if anyone can. Americans need such rugged guy now to help build that great nation again whkich all of us all over d world depended greatly on for provision and protection. Go on Trump you're d best.

06:18 24/02/16

https://www.youtube.com/watch?v=V3miuaOWsj8

06:20 24/02/16

gud 2 go.

06:22 24/02/16

What started as joke is fast becoming a reality and it so crazy to think that this man may become the POTUS in no distance time. You all should not be surprise when he came out after winning and said he ran just for heck of it and that he has no idear of what to do now as the prisident.

06:23 24/02/16

Shaking my head, that's about all I can do when I read about his victories. I seriously question the intelligence and mindset of his supporters. God help us.

06:24 24/02/16

what they lost there dame mind right

06:25 24/02/16

Go to hell

06:28 24/02/16

If I have to choose between Donald or Hilary I think I'll just go back to my country Haiti still don't think that safe

---

06:28 24/02/16

America they will go down if he win

06:34 24/02/16

Trump 4 real

06:37 24/02/16

His money goes to killing wildlife:
https://www.facebook.com/photo.php?fbid=874280182685478&set=a.347612158685619.82769.1

06:40 24/02/16

I am.

06:42 24/02/16

Hahaha God help you if he win the election

06:48 24/02/16

After Hitler, after Ben Laden, this is Trump from KKK – for a world of peace don't vote for him ! USA is not Trump

---

07:00 24/02/16

Really America ?

07:13 24/02/16

Iam supporting Trump because his comedy remarks, he said, "i will build a wall in mexican border and mexico will pay it

---

07:26 24/02/16

Woke up to make some Tea and what great news! What makes it so funny is reading all of the irrational, panicked, misinformed, exaggerated and moronic comments in this thread.

07:33 24/02/16

This win also reflects the true character of Americans.. If they can support him its coz they believe in his opinions and actions. No wonder they are killing each other daily

---

07:37 24/02/16

Just by reading all these comments, one can understand why Americans are voting for Trump!!

07:40 24/02/16

Nooooo

07:40 24/02/16

if him win Clinton don't have to run against him.
that no mek sense. when the election every body just go vote.

07:41 24/02/16

Sanaya Shikari WHAT IS THISS

07:44 24/02/16

Most unusual to have someone running for a political position,speaking what a lot of people are scared to say, for fear of prosecution. Well in the UK they would. Be prosecuted, locked away and forgotten about. I was joking Dragon. I was. lol (TmA)

07:46 24/02/16

oh dear. This man will ruin America.

07:47 24/02/16

OK let's who is best, Adolf Hitler or Donald Trump... ??

07:49 24/02/16

Whoever votes for him deserve what they get!

07:49 24/02/16

and it funny how the media a dig up things and a press things on ms Clinton and them not doing trump nuttin. every minute. email..now speach fi money.Bengazi no one can stop a terrorist attack them can only try to prevent it. she do her best.. she is a strong woman. stronger than the iron lady. keep up the good work ms clinton punch them left jabs and right and one uppercut in the end. we from the island of Jamaica love u.

07:57 24/02/16

trump hates muslims n almost all american christians n jews hate muslims so its a simple calculation he is the next president of USA.

08:07 24/02/16

Hater of human kind ? Some says ?

08:08 24/02/16

He must be paying them to vote, the man is a total joke to humanity.

08:11 24/02/16

#trumpcheats
#trumpdirtytricks
Ted Cruz Unites, leads, apologizes for minor faults, accepts responsible. A true conservative leader. Trumps doesn't accept responsibility, divides groups, and almost never apologizes. Nothing to add only subtracts. Trumps obviously has many Non–Leader liabilities.

... & This country is going to hell in a golden woven basket. Lol Hey it's not over to the foul mouthed boy sings. But until that day it's better to laugh than cry.
For Trump's insults the USA needs a good bar of American made soap. "Guard the door of your lips." So Trump said that he could "murder" someone? My supporters are loyal"(Paraphrasing) I like comedy, but why even joke about violence?And he should apologize for calling THE GREAT POPE FRANCIS "DISGRACEFUL", that would be nice. And bring more respect for himself, Roman Catholics & the Great USA.

CRUZ 2016 Conservative fairness & unity. America First. Security & Constitution.

Tired of Trumps Tantrums & Tactics?? Donald Trump is an angry divisive man with some money in an wannabe Statesman's empty suit. He is not a Unifier in these United States of America, he's a divider.
Petty politics AA ball. Trump better put on his baseball cap again, the big leagues are next.

Here's a defense & idea, the press/media is a double edge sword. What's old is new, new old. Very easily you can find current & archived negative press stories about Trump the last 50 yrs. there must be plenty plenty of NY press articles about Trump divorces, evictions, play boying, politician games, casino shenanigans, lawsuits, at least one thousand, 1000 Trump Wrongdoings, lies, and just not nice behavior. Have a team find them, highlight, word search the word "lie","stole","lawsuits" briefly in each of the one thousand articles found. Lol. Unleash it on block all at once on your website & everywhere, the press. And prove that he(Trump) is the liar, wrong doer, not nice person. And archived anti Trump 1000 Article Trump media FACTUAL review. I'd do it, just an idea.

CRUZ 2016 Leadership.
Accountability, Resolve. More Action, Less Talk.
Ted Cruz 2016 A Proven Advocate for Freedom. Getting results. Policy Results & discourse. Understsnding the party not attacking it. Bringing the Conservative Republican Party together, not dividing it.
–Trump: No track record. Proven Insults. –

Americans don't want a strong leader, they want a good one.
Ted Cruz 2016 Ł Building Bridges Before Walls. Trust Ted you won't be fired! Trust Ted, he won't fire you. Ted Terrific.

For CRUZ 2016 & supporters::
–"Never, Never, Never give up."
Winston Churchill

For Trump & supporters:
"Courage is what it takes to stand up and speak; courage is also what it takes to sit down and listen."–
Winston Churchill

08:16 24/02/16

that's something been added to their food so they have lost reason WAKE UP AMERICA before its to late

---

08:17 24/02/16

is it only the rest of the world that can see him for who he is? have they put something in the US water supply?

08:26 24/02/16

> Putin on one side, Trump potentially (but hopefuuly not) on the other. Each with their nuclear buttons. At least Kennedy and Kruschev were both sane

---

08:26 24/02/16

> i am really confuse now, people voting for trump to be a president or wants trump clown to keep running a circus show for them and entertain them. but which one?

08:29 24/02/16

> Trump wins again!
> The positive thing about him is he isn't just ambitious. He wants to tackle America's problems head on, so you have to admire him for that. But he seems to have negative about whole ethnic groups. You can't do that. He should be targeting the criminal's and drugs people in all USA communities. His ideas seem not to be thought threw and not workable or fair. But he certainly isn't boring!

08:32 24/02/16

> Help

08:33 24/02/16

> What the heck is wrong with them?

08:46 24/02/16

> The best choice for the US

08:46 24/02/16

> Nice short

09:04 24/02/16

> Express your opinion using Ripplear dot com.

09:11 24/02/16

> What a troll.

09:14 24/02/16

> you must be so sad BBC. And 46% from the hispanic votes? How your media propaganda trying to make trump look like he hates mexicans has failed. We get our news from truthful sources now, your time is over

09:16 24/02/16

what i get to realised is that trump keeps loosing on social media but winning in d real world in U.S... just saying my view frm Africa

09:23 24/02/16

Never mind young Americans this is dumb Americans

09:34 24/02/16

"It is the absolute right of the State to supervise the formation of public opinion."
Joseph Goebbels

09:38 24/02/16

Jesse Boeve Dino Kadric Bertram van der Aa Bram Verbaas NOBODY CAN STOP
US! WE WILL MAKE AMERICA GREAT AGAIN!!!!

09:48 24/02/16

love you trump .you can only save America and this planet .vote for trump

09:51 24/02/16

Congrats .keep it up .I support u

09:53 24/02/16

Top job Trump! How'd you pull that one off? God?

10:01 24/02/16

I feel sick.

10:17 24/02/16

GOP must be shaking by now I believe...Go Trump#2016

10:31 24/02/16

They will get what they deserve, god help us all

10:40 24/02/16

Oh whats going on, it must be something wrong

10:51 24/02/16

I don't get it, if he's winning it means the mass public of these states are agreeing with the racist, facist and extremely vile statements Trump continuously makes? These people are simply government controlled patriots systematically taught to believe that everything there government does has no exterior motive other than 'God bless America' lol what a joke

---

10:55 24/02/16

Go Trump... Go

11:05 24/02/16

QUESTION: Why does the media report about John Kasich sticking his foot in his mouth about women in the kitchen, but the media does not report the FACT that Kasich is a proven COWARD regarding his very own daughters and would be DANGEROUS as Commander in Chief? Refer to the web sites http://NotKasich.com/ and http://ABCsOfBetrayal.com/ for the facts as reported by the Columbus Dispatch including audio recordings of those who got caught during that 10-year Conspiracy of Criminal Negligence, Deception, Fraud, and Cover-Ups committed against thousands of consumers involving millions of dollars.

11:32 24/02/16

Trump wins, more guns, more wars, more racism, killings, more intolerance , just bloody great! Exactly what the world needs right now aye !!?

11:40 24/02/16

Those litle countries in America its not relevant, two bigest states in America gona decide who is going to win presidental elections those states California and Texas gona decide i dont even know why people overeacted so much about this...

11:46 24/02/16

His appearance says enough... People like him wiped out the American Indians.. Calling them savages! To grab land that belonged to the native Indians! Barbaric!

12:01 24/02/16

Very very scary let's all pray the US comes to its senses but with 95% of the US population only ever seeing their own state you can sort of forgive them for not understanding how scared the rest of the world is right now

12:24 24/02/16

let him also rule change in presidenny can also change som thing as in develpment.

12:29 24/02/16

Oh my good grief, there is no hope for humanity!!! Hitler was also allowed to go to run a Country and look what he did!!!

12:46 24/02/16

Naden Scarfone this frightens me

12:54 24/02/16

TRUMP WILL CAUSE. INTERNATIONAL CONFLARATION IF HE SUCCEEDS ON THE PATH HE IS THREADING . HE SHOULD BE THROWN OUT BY DEMOCRATIC AMERICANS !

13:07 24/02/16

Dont forget we had Thatcher in this country.

13:59 24/02/16

Nasir Babangida

14:07 24/02/16

Yes trump love it .from the UK

14:16 24/02/16

Ibrahim Abdel–Hafiz

14:20 24/02/16

If Trump wins then its true America has stable supply of fools!..i know that can't happen.

14:21 24/02/16

American version of Mar Roxas.

14:23 24/02/16

OHM America where are you going! That is terrible.

14:33 24/02/16

Money bailed him out; hope he burns out.Trumped up tit.

14:52 24/02/16

God Bless Trump, from us here in the UK! Ł

14:57 24/02/16

Syria,Iran,Turkey,Uganda,zimbawe,Eq–Guinea and Gambia.Jast play so hard that Trump should not become the president of USA.He will bulldoze u 4rom right,left and center.This man iz crazy.

15:39 24/02/16

Good decision ,thanks Americans as you look forward to usher in a new democratic changes because the foreign policies have to be worked on and Trump is more ideal

---

15:49 24/02/16

Can't believe voters are stoking the ego of one of the maddest people on Earth.

16:06 24/02/16

16:13 24/02/16

Good luck Trump, from supporters in Wales, UK.

16:53 24/02/16

I hate this world. Wake up sheep, they're leading you to the slaughter!

17:06 24/02/16

on beharth of working ppl Bristol UK we support you Donald J. Trump

---

17:09 24/02/16

America must of lost the plot even more than normal god fekin help us if this thing gets in charge

---

17:18 24/02/16

Trump is being called "the next great messiah who will make this country great again." Funny. That's what they said of Adolph Hitler.

17:54 24/02/16

I find this more scary than isis

17:59 24/02/16

good luck

18:06 24/02/16

Dear rest of the world: pray for us. God help us if he wins the presidency.

18:18 24/02/16

Trump all the way! Ł

18:32 24/02/16

Que bien vamos Donald trump.. tienes que ganar en todo usa

18:33 24/02/16

Gooo Donald..

18:59 24/02/16

Will it fit on the mantlepiece?

19:32 24/02/16

Please nooooo

19:46 24/02/16

Go Donald....

20:16 24/02/16

He's a coward and i hate when people spread rumours about muslims that not only causes hatred among other nations but also spreads unfriendly relations which is known to all those nations that had extreme fights between just because of rumour the whole territory is destroyed it not only kills human beings but it destroys everything that once was achieved...

20:31 24/02/16

MERHABA ARKADALAR, PARAYA HT YACI OLAN DOSTLARIMIZIN
KES NL KLE OKUMASI GEREKEN B R YAZIDIR.
renci dostlar m z, memur dostlar m z, paraya ihtiyac olan
aile sahibi dostlar m z, k saca paraya ihtiya duyan
herkesin bana ula mas n temenni ederim.
Tek yapman z gereken bana ula makt r. Profilime mesaj
atabilirsiniz. Takip etmekten bir ey kaybetmezsiniz.
yi vakitler dilerim arkada lar.

21:14 24/02/16

They deserve help,research your subject first ,he could save USA ,Main Street media is not honest sorry

---

21:18 24/02/16

Ramin Mahmoodi Jeez

21:29 24/02/16

Scarey!!

21:52 24/02/16

I can't believe that the American people are so backwards at coming forwards that they are even considering letting this moron in the White House

---

22:09 24/02/16

Erin Geiger

22:14 24/02/16

The people in the United States. .had enough. ..and people are voting in big numbers for. The first time. ..they are winning. ..Trump is helping them. ..

22:20 24/02/16

so there is dis majority who think like dis man,

22:22 24/02/16

Well looks like im never coming to vegas again.

22:57 24/02/16

PURE TRADITIONAL HERBS WHICH ADHERE TO THE INTERNATIONAL NORMS
Powerful Spiritual Traditional Herbalist Healer
Experienced in Ancestral healing and spell casting, Astrologers, African Medicines, Ritualism, Herbalist healer, Spiritual healer, Native healer, Philosophy, Traditional healer.
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Email : Greatsalemtemple@gmail.com
Facebook ID: GREAT SALEM TEMPLE

Herbal remedies, holistic healing;
1. Sandawana oil for all spells.
2. Bring Back Lost Lover, even if lost for a long time
3. Remove Bad spells from homes, business &customer attraction etc.
4. Get Promotion you have desired for a long time at work or in your career.
5. Remove the Black spot that keeps on taking your money away
6. Find out why you are not Progressing in life and the solution
7. Eliminate in Family Fights among est each other
8. Ensure excellent school grades even for children with Mental Disabilities
9. Stop your Marriage or Relationship from breaking apart
10. We destroy and can send back the Tokoloshe if requested
11. We heal Barrenness in women and disturbing menstruation
12. Get you marriage to the Lover of your choice
13. Loose and Gain weight
14. Guarantee you win Family Protection Spells.
15.Sangoma & Pastors who need more Powers.
Are your family members getting sick mysteriously?
Are your family members not making any progress in life with their career, in school or with their business?
Protection Spells to protect and keep your family safe and help them to be successful in life and to prosper

---

22:58 24/02/16

Be fun see him leading the un haha

23:08 24/02/16

His been bank rap 2 time he will do it with the USA

23:14 24/02/16

I'm all aboard the Trump 2016 train!!

23:17 24/02/16

ARMAGEDDON a bad feeling about this.

23:58 24/02/16

This is joke .

00:32 25/02/16

This is what happens when you put drugs in a nations waters to drug everyone and make them robots, no longer can people think , but then again, you didn't have a better competition did you?

00:35 25/02/16

trump is a fool.

01:13 25/02/16

digital india ł
Andriod mobile RS 15000-50000/
. ł Advertising
. ł ł
ł
ł ... ł whatsApp no.
(9780383935) ł "JOIN" send .

03:13 25/02/16

To all the sane people of Nevada, you have my sympathies.

03:52 25/02/16

The Holy Bible never say in anywhere that #Jesus is #God,
But the #Bible prove that #Jesus is the son of #God and was sent by #God the #Father as #Prophet on #Earth to save the whole world.

The devil was haven #Authority on Earth before #Jesus #Matt 4:1 to 11 but after his #Crucifixion and #Resurrection all #Authority in #Heaven and on #Earth has been given to him by #God the #Father #Matt 28:18
Now #Jesus is #Lord in #Heaven and a #King on the whole #Earth

While #God the #Holy #Father is #King of #Kings and #Lord of #Lords

Now the devil as a ruler now on Earth has no Authority on us but can only deceive us to do Bad. The #Bible never lie just that we are all deceive by the Roman Empire with the Teachings ...

Stay Awake b'cus the Kingdom of God is @Hand

04:27 25/02/16

Trump would like to take us back to pre–Magna Carta days...

05:37 25/02/16

Hmmm, welcome to reality. If African leaders will invest in Africa. All these will not matter. Have we heard of Japan, S. Korea Singapore complained about his harsh statements.

08:30 25/02/16

join the illuminati to be rich and famous in the whole world, whasapp +2348143559477 for help now

---

09:15 25/02/16

TUCK FRUMP

09:17 25/02/16

What Ever Trump say .... he Really does not Mean Anything .... if it Does .... then its not practical ....In today's world and Emerging Global Market. .....He is a business Man .... he is selling his Each and every word. .....& people Are buying it .... Nearly 3 hundred thousand American Muslims peace is jeopardise ... and is going to windows up A racial discrimination ...from one End to other End ....America is going to start A war Or A civil war Inside On Who is **Native American ** who has A right to live ...His latest word we will going to fill lot of bad dude in Jails ...Oh Mr Cow Boy ... they Are Already filled will Afro American s.....?

09:26 25/02/16

He is a good person which be president of .u.s.a

10:06 25/02/16

Donald Trump is a joke, just like the US election system

10:06 25/02/16

Once

10:06 25/02/16

Once trump speaks against Muslims he's going to win

C.2 Twitter

18:36 19/02/16

Kesha 'in tears' after judge denies her release from Sony where producer allegedly raped her https://t.co/thYQgcH9AW https://t.co/XBnz5x5fIJ

18:37 19/02/16

> @dailymailceleb #sonysupportsrape

20:12 19/02/16

> @Btwsts @DailyMailCeleb you do realise thats slander without proof, If sony wanted too they could sue you. People have been sued for less.

20:33 19/02/16

> @Btwsts what rape?

19:34 19/02/16

> RT @DailyMailCeleb: Kesha 'in tears' after judge denies her release from Sony where producer allegedly raped her https://t.co/thYQgcH9AW ht

---

19:36 19/02/16

> @DailyMailCeleb @MailOnline E chi ?

19:38 19/02/16

> She should have know the "casting couch" deal clincher is still practiced in some pop-media orgs.
>
> @DailyMailCeleb @MailOnline

19:40 19/02/16

> @DailyMailCeleb @MailOnline no restraining order?

20:33 19/02/16

> @DailyMailCeleb @MailOnline so she was raped but did not file charges, bull shit.

20:46 19/02/16

> @DailyMailCeleb @MailOnline see, judges can be stupid, too. No wonder it took so long for Cosby accusers to come forward. That sucks, Kesha

---

C.3 Reddit

15:24 21/02/16

Brexit against Scotland's wishes would 'almost certainly' trigger independence referendum, warns Nicola Sturgeon

---

15:27 21/02/16

> You could trigger an independence referendum if Cameron said he doesn't much care for the flavor of Irn Bru

---

19:41 21/02/16

> Irn Bru....
>
> ..It's pig fuckingly good.

00:39 22/02/16

> that moment of deep disappointment when you realize it wasn't a can of lucozade

---

15:52 21/02/16

> 1 they had a referendum and decided to stay, you can't just referendum whenever you feel like it
> 2 Scotland would not gain straight entry to the Euro, there are a few other members who didn't want them with the oil money so without it they would have a battle to get in
> 3 Nicola sturgeon is a cunt

16:49 21/02/16

> You actually can call for a referendum whenever you want.

17:07 21/02/16

> Like France, Ireland etc.

18:52 21/02/16

> 1) yes, yes you can. Whether that referendum actually leads to anything is another story. In saying that, if we voted for independence and then weren't allowed to by Westminster there would be civil war in some shape or form.
>
> 2) Scotland would have a much easier time getting in than Ukraine, for instance. We already follow all of the policies and regulations to the letter.

3) She is, but she's *our* cunt and I trust her/the SNP a hell of a lot more than the other cunts playing political panto in London.

21:17 21/02/16

Easier than Ukraine but how long did that take

The thing I don't get is the hate sturgeon kicks up about the English
99% of English or Welsh could not give a fuck if your Scottish or not, working in Scotland during the lead up to the vote she got it all very us against them!
If you don't like Cameron then say that but don't try to turn one country on another

---

21:28 21/02/16

It's got minute amount to do with minute amount of English people and a massive amount to do with the English establishment.

21:49 21/02/16

It's the uk establishment not English!
If you work it out on votes per representative in Westminster snp has a very good representation, a lot better than labour conservative lib dem or ukip

---

21:57 21/02/16

Except for the fact that we have a government that only 46% of population of the UK voted for. Great representation there!

22:07 21/02/16

> Democracy . Not saying I voted conservative or even like the toff nosed prick but there were over 25 different choices nationwide plus independents
>
> With that many options 40% is a big margin
>
> In America it's a 2 horse race and you can have a leader only 51% votes for

---

22:28 21/02/16

> *FPTP, not the most representative of democratic systems. Not really that democratic at all once you start thinking about it.

11:07 22/02/16

> Enjoy being governed by Berlin.
>
> I will laugh.

19:30 21/02/16

> The fuck you say, bruv?

11:06 22/02/16

> true
>
> true
>
> I lol'd but true nevertheless.

16:01 21/02/16

> This is the best tl;dr I could make, [original](http://www.independent.co.uk/news/uk/politics/eu-referendum-brexit- reduced by 69%. (I'm a bot)
> *****
> > The Scottish First Minister and SNP leader said if England voted to leave the EU while Scotland voted to remain there would be an "Inescapable" shift in public opinion towards independence to guarantee the country's continued EU membership.

> "If, a couple of years later, we find ourselves, having voted to stay in the EU, being taken out against our will, I think there will be many people – including people who voted No in 2014 – who would say the only way to guarantee our EU membership is to be independent."

> Ms Sturgeon acknowledged that an independent Scotland in the EU would have to negotiate its border arrangements if the remainder of the UK was outside the EU. She added that said she has "No proposals" to use her new devolved powers to top up benefits for migrants, but said EU migrants have had a positive impact on the UK economy.

*****
[**Extended Summary**](http://np.reddit.com/r/autotldr/comments/46vtfa/brexit_against_scotlands_w
|
[FAQ](http://np.reddit.com/r/autotldr/comments/31b9fm/faq_autotldr_bot/
"Version 1.6, ~38302 tl;drs so far.") |
[Theory](http://np.reddit.com/r/autotldr/comments/31bfht/theory_autotldr_concept/)
| [Feedback](http://np.reddit.com/message/compose?to=%23autotldr
"PMs and comment replies are read by the bot admin, constructive feedback is welcome.") | *Top* *keywords*: **vote**^#1 **EU**^#2 **Scotland**^#3 **referendum**^#4 **campaign**^#5

19:37 21/02/16

tl;dr but "brexit" has got to stop. I can't hear that word every day until June. Please.

22:52 21/02/16

Yes please, this is worse than Brangelina.

19:57 21/02/16

The oil is a bonus.

20:08 21/02/16

Can we also vote to kick Scotland out? Oil is the only thing you have and that's worth dick right now, so leave all you want.

00:47 22/02/16

well they've got bagpipes and tartan...oh wait they got those from ireland...um trump golf courses?

20:36 21/02/16

> How quickly can a referendum be called anyways?

21:54 21/02/16

> that arsey dwarf is (one of) the reasons why we've got a tory government

23:00 21/02/16

> If every single person in Scotland voted labour, the Tories still would have won

00:25 22/02/16

> the snp claimed labour would need them to govern, and that scotland would have the sway over a future labour government.
>
> great for her home audience, but the tories used it to make labour look like their puppet– a british parliament working for scotland.
>
> so scotland gets all those mps but as you say, not enough to decide any policies AND they ensured a tory victory.
>
> edited for my shocking spelling

22:03 21/02/16

> This is getting beyond a joke with this Independence crap now, The SNP and more specifically Sturgeon are looking for just about any excuse to force through another Independence vote.
>
> The majority voted no and were vindicated in that vote when it was shown later that the SNPs predictions for North Sea oil were out massively (based on oil being $100+ per barrel) The SNP predictions for 2016/17 Oil revenue was 8 billion, That number is now as low as 500 million.
>
> http://www.prospectmagazine.co.uk/blogs/george–magnus/the–snps–economic–case–is–d
>
> http://www.ft.com/cms/s/0/ccac5894–a337–11e5–a035–96e9dfdf9fff.html
>
> http://www.telegraph.co.uk/news/uknews/scottish–independence/12052565/Independent–

> It's got so bad with the SNP incessant talk of another independence vote David Cameron could be seen eating a Tunnock's Teacake and Sturgeon would demand an independence vote, Maybe she should spend more of her time focused on the important politics for Scotland and not this ridiculous idiotic blind drive towards an independence that the majority of Scots have already said no to.
>
> Edit: Here come the downvotes by the hardcore independence mentalists who can never see any bad in what the SNP do as long they get their Freeeeeddooooommmm.

01:21 22/02/16

> To pretend that Brexit wouldn't effect Scotland is ridiculous. To believe that the leader of the SNP wouldn't mention Independence, over concerns for what Brexit would do to Scotland, is also ridiculous.
>
> Besides, the Independence vote was very, very close, and you can't force us to be your friends forever.

02:04 22/02/16

> it was a third of the eligible electorate, two thirds did not vote for independence (44% my arse)

05:09 22/02/16

> At these oil prices, an independent Scotland would be very poor.

22:19 21/02/16

> Not British, but why would the UK go for Brexit, knowing that this is the case?

01:32 22/02/16

> Hurry up and leave then FFS. Tired of her constantly threatening to leave every time she disagrees with something.
>
> At this point scotland leaving is inevitable if a referendum can be called every couple of years.

01:41 22/02/16

> Don't worry. When the SNP sinks the Scottish economy, they will turf the SNP out.

11:04 22/02/16

> If you can't build a tram system how can you build a country?

04:43 22/02/16

> they could leave the uk tomorrow and for the next 200 years they'd still blame the english every time they found a vegetable in their dinner

---

06:28 22/02/16

> Let them go. I'm tired of the Scots whining.
>
> There is no utopia South of the border that they are being denied.
>
> Put up a border enforce passport control and let them be governed from Berlin by Merkel.
>
> I'm sure Merkel will look after them.
>
> It's a pity the rest of the UK doesn't get a vote, they would definitely be out.

Appendix D

Perception Experiment Data

D.1 Breakdown of Responses by Question

Table D.1: Average agreement to the statement *This comment is coherent/easy to understand*, by classification present

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Information	1.00	2.00	4.00	4.00	5.00	3.475	1.131
Transition	1.00	3.00	4.00	5.00	5.00	3.750	1.112
Logical Attack	1.00	2.00	4.00	4.00	5.00	3.308	1.191
Logical Support	2.00	3.50	4.00	4.00	5.00	3.778	0.737
Rhetorical Attack	1.00	3.00	4.00	4.00	5.00	3.527	1.107
Rhetorical Support	1.00	3.00	4.00	4.00	5.00	3.580	1.113
Preference	2.00	2.50	3.00	3.50	4.00	3.000	1.000
Entity	1.00	3.00	4.00	4.00	5.00	3.511	1.122
Group	1.00	3.00	4.00	4.00	5.00	3.527	1.126
Audience	1.00	3.00	4.00	4.00	5.00	3.510	1.109
Implied Relationship	2.00	3.00	4.00	4.00	4.00	3.429	0.728
Implied Belief	1.00	4.00	4.00	4.75	5.00	3.800	1.108
Spam/Advertisement	1.00	1.00	1.00	1.00	1.00	1.000	0.000
Unknown	1.00	1.75	2.50	3.50	5.00	2.750	1.479
None	1.00	1.25	4.00	4.00	5.00	3.100	1.578

Table D.2: Average agreement with the statement *This comment contains (or appears to contain) credible information*, by classification present

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Information	1.00	2.00	3.00	4.00	5.00	2.756	1.069
Transition	1.00	2.00	3.00	3.00	5.00	2.600	1.091
Logical Attack	1.00	2.00	3.00	4.00	5.00	2.966	1.036
Logical Support	1.00	2.00	3.00	3.50	5.00	2.815	1.020
Rhetorical Attack	1.00	2.00	2.00	3.00	5.00	2.418	1.043
Rhetorical Support	1.00	2.00	3.00	3.00	5.00	2.547	1.084
Preference	2.00	2.00	2.00	2.00	2.00	2.000	0.000
Entity	1.00	2.00	2.00	3.00	5.00	2.427	1.032
Group	1.00	2.00	3.00	3.50	5.00	2.873	1.113
Audience	1.00	2.00	2.00	3.00	5.00	2.356	1.028
Implied Relationship	1.00	2.00	2.00	2.50	3.00	2.143	0.639
Implied Belief	1.00	1.25	2.00	3.00	5.00	2.333	1.135
Spam/Advertisement	1.00	1.00	1.00	1.00	1.00	1.000	0.000
Unknown	1.00	1.00	2.00	3.00	3.00	2.000	1.000
None	1.00	1.00	1.00	2.50	4.00	1.700	1.100

Table D.3: Average agreement with the statement *This comment makes (or attempts to make) a persuasive argument*, by classification present

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Information	1.00	2.00	4.00	4.00	5.00	3.196	1.137
Transition	1.00	2.00	3.00	4.00	5.00	2.825	1.138
Logical Attack	1.00	2.00	4.00	4.00	5.00	3.329	1.211
Logical Support	1.00	2.00	3.00	4.00	4.00	3.000	1.089
Rhetorical Attack	1.00	2.00	3.00	4.00	5.00	2.965	1.160
Rhetorical Support	1.00	2.00	3.00	4.00	5.00	2.685	1.192
Preference	3.00	3.25	3.50	3.75	4.00	3.500	0.500
Entity	1.00	2.00	3.00	4.00	5.00	2.886	1.177
Group	1.00	2.00	4.00	4.00	5.00	3.273	1.242
Audience	1.00	2.00	2.50	3.00	5.00	2.596	1.043
Implied Relationship	1.00	2.50	3.00	4.00	5.00	3.143	1.245
Implied Belief	1.00	2.00	3.00	4.00	5.00	3.000	1.155
Spam/Advertisement	1.00	1.00	1.00	1.00	1.00	1.000	0.000
Unknown	1.00	1.00	2.00	3.00	3.00	2.000	1.000
None	1.00	1.00	1.00	2.50	3.00	1.600	0.917

Table D.4: Average agreement with the statement *This comment is (or attempts to be) entertaining*, by classification present

Annotation	**Min.**	**Lower Quartile**	**Median**	**Upper Quartile**	**Max.**	**Mean**	σ
Information	1.00	2.00	3.00	4.00	5.00	2.678	1.178
Transition	1.00	1.75	3.00	4.00	5.00	2.650	1.216
Logical Attack	1.00	1.00	2.00	3.00	5.00	2.158	1.090
Logical Support	1.00	2.00	3.00	3.00	5.00	2.704	0.974
Rhetorical Attack	1.00	2.00	3.00	4.00	5.00	3.094	1.221
Rhetorical Support	1.00	3.00	4.00	4.00	5.00	3.420	1.142
Preference	3.00	3.25	3.50	3.75	4.00	3.500	0.500
Entity	1.00	2.00	4.00	4.00	5.00	3.280	1.181
Group	1.00	2.00	3.00	4.00	5.00	2.873	1.207
Audience	1.00	3.00	4.00	4.00	5.00	3.740	0.971
Implied Relationship	2.00	2.00	3.00	3.50	4.00	2.857	0.833
Implied Belief	1.00	2.00	3.00	4.00	5.00	2.967	1.303
Spam/Advertisement	1.00	1.00	1.00	1.00	1.00	1.000	0.000
Unknown	1.00	1.75	2.50	3.00	3.00	2.250	0.829
None	1.00	1.50	3.00	4.00	5.00	3.000	1.483

Table D.5: Average agreement with the statement *This comment is (or attempts to be) offensive*, by classification present

Annotation	**Min.**	**Lower Quartile**	**Median**	**Upper Quartile**	**Max.**	**Mean**	σ
Information	1.00	2.00	2.00	3.00	5.00	2.556	1.152
Transition	1.00	1.00	3.00	3.25	5.00	2.575	1.181
Logical Attack	1.00	1.00	2.00	3.00	5.00	2.301	1.088
Logical Support	1.00	2.00	3.00	4.00	5.00	2.963	1.261
Rhetorical Attack	1.00	2.00	3.00	4.00	5.00	3.164	1.141
Rhetorical Support	1.00	1.00	2.00	3.00	5.00	2.309	1.104
Preference	3.00	3.00	3.00	3.00	3.00	3.000	0.000
Entity	1.00	2.00	3.00	4.00	5.00	2.853	1.206
Group	1.00	2.00	3.00	4.00	5.00	2.873	1.192
Audience	1.00	2.00	3.00	4.00	5.00	2.817	1.116
Implied Relationship	1.00	3.00	4.00	4.00	5.00	3.429	1.178
Implied Belief	1.00	2.00	3.50	4.00	5.00	3.333	1.135
Spam/Advertisement	1.00	1.00	1.00	1.00	1.00	1.000	0.000
Unknown	1.00	1.00	1.00	1.50	3.00	1.500	0.866
None	1.00	1.00	1.00	2.75	3.00	1.700	0.900

Table D.6: Average response to the question *Would you be more or less likely to reply to this comment than average?*, by classification present

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Information	1.00	1.00	2.00	3.00	5.00	2.322	1.088
Transition	1.00	2.00	3.00	3.00	5.00	2.525	1.072
Logical Attack	1.00	1.00	2.00	3.00	5.00	2.390	1.161
Logical Support	1.00	1.50	2.00	3.00	4.00	2.185	0.862
Rhetorical Attack	1.00	1.00	2.00	3.00	5.00	2.199	1.062
Rhetorical Support	1.00	1.00	2.00	3.00	5.00	2.271	1.061
Preference	2.00	2.00	2.00	2.00	2.00	2.000	0.000
Entity	1.00	1.00	2.00	3.00	5.00	2.238	1.052
Group	1.00	1.00	2.00	3.00	4.00	2.200	1.051
Audience	1.00	1.75	2.00	3.00	5.00	2.385	1.059
Implied Relationship	1.00	1.00	1.00	2.00	3.00	1.571	0.728
Implied Belief	1.00	1.00	2.00	3.00	4.00	2.067	0.892
Spam/Advertisement	1.00	1.00	1.00	1.00	1.00	1.000	0.000
Unknown	1.00	1.00	1.00	1.50	3.00	1.500	0.866
None	1.00	1.00	1.00	2.50	4.00	1.700	1.100

Table D.7: Average response to the question *Would you be more or less likely to share this comment (to friends/followers/etc.) than average?*, by classification present

Annotation	Min.	Lower Quartile	Median	Upper Quartile	Max.	Mean	σ
Information	1.00	1.00	2.00	3.00	5.00	2.045	0.950
Transition	1.00	1.00	2.00	3.00	4.00	2.025	0.961
Logical Attack	1.00	1.00	2.00	3.00	5.00	2.048	1.016
Logical Support	1.00	1.00	2.00	3.00	4.00	2.000	0.903
Rhetorical Attack	1.00	1.00	2.00	2.00	4.00	1.863	0.906
Rhetorical Support	1.00	1.00	2.00	3.00	4.00	2.122	1.033
Preference	2.00	2.00	2.00	2.00	2.00	2.000	0.000
Entity	1.00	1.00	2.00	3.00	4.00	2.010	0.970
Group	1.00	1.00	2.00	3.00	4.00	1.927	0.912
Audience	1.00	1.00	2.00	3.00	4.00	2.269	1.058
Implied Relationship	1.00	1.00	1.00	2.00	3.00	1.571	0.728
Implied Belief	1.00	1.00	2.00	2.00	3.00	1.800	0.792
Spam/Advertisement	1.00	1.00	1.00	1.00	1.00	1.000	0.000
Unknown	1.00	1.00	1.00	1.50	3.00	1.500	0.866
None	1.00	1.00	1.00	1.00	3.00	1.200	0.600

Table D.8: Average response to the question *Would you be more or less likely to up-/down-vote this comment than average?*, by classification present

Annotation	**Min.**	**Lower Quartile**	**Median**	**Upper Quartile**	**Max.**	**Mean**	σ
Information	1.00	1.00	2.00	3.00	5.00	2.497	1.162
Transition	1.00	1.00	3.00	3.00	4.00	2.450	1.094
Logical Attack	1.00	1.00	3.00	4.00	5.00	2.548	1.188
Logical Support	1.00	2.00	2.00	3.00	4.00	2.333	0.903
Rhetorical Attack	1.00	1.00	2.00	3.00	5.00	2.426	1.190
Rhetorical Support	1.00	2.00	3.00	3.00	5.00	2.530	1.149
Preference	2.00	2.00	2.00	2.00	2.00	2.000	0.000
Entity	1.00	1.00	2.00	3.00	5.00	2.463	1.167
Group	1.00	2.00	3.00	3.50	5.00	2.618	1.168
Audience	1.00	2.00	3.00	4.00	5.00	2.625	1.145
Implied Relationship	1.00	1.00	2.00	3.50	5.00	2.429	1.498
Implied Belief	1.00	2.00	3.00	4.00	5.00	2.667	1.164
Spam/Advertisement	4.00	4.00	4.00	4.00	4.00	4.000	0.000
Unknown	1.00	1.00	2.00	3.25	4.00	2.250	1.299
None	1.00	1.00	1.00	2.50	4.00	1.700	1.100

Table D.9: Average response to the question *Would you be more or less likely to report this comment than average?*, by classification present

Annotation	**Min.**	**Lower Quartile**	**Median**	**Upper Quartile**	**Max.**	**Mean**	σ
Information	1.00	1.00	2.00	3.00	5.00	1.986	0.932
Transition	1.00	1.00	2.00	3.00	4.00	1.900	0.970
Logical Attack	1.00	1.00	2.00	3.00	5.00	1.973	0.958
Logical Support	1.00	1.00	2.00	3.00	4.00	2.074	0.979
Rhetorical Attack	1.00	1.00	2.00	3.00	5.00	2.094	0.996
Rhetorical Support	1.00	1.00	2.00	3.00	5.00	1.972	0.960
Preference	2.00	2.25	2.50	2.75	3.00	2.500	0.500
Entity	1.00	1.00	2.00	3.00	5.00	2.042	0.999
Group	1.00	1.00	2.00	3.00	5.00	2.182	1.011
Audience	1.00	1.00	2.00	3.00	4.00	2.154	0.948
Implied Relationship	1.00	1.50	3.00	3.50	5.00	2.714	1.385
Implied Belief	1.00	2.00	2.00	3.00	5.00	2.333	1.043
Spam/Advertisement	5.00	5.00	5.00	5.00	5.00	5.000	0.000
Unknown	1.00	1.00	1.00	1.50	3.00	1.500	0.866
None	1.00	1.00	1.00	1.75	4.00	1.600	1.020

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