Change your mind and that might change the world!

A corpus-based study of persuasive argumentation and reasoning facilitating opinion change on r/ChangeMyView

Bachelor thesis in Communication Science (BSc)

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Enschede, Netherlands

August 2024

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Abstract

This research looks on how opinions are changed in the "Change My View" (CMV) Reddit community, with a particular emphasis on drug-policy-related discussions. The study looks at delta-awarded comments using a qualitative content analysis methodology to find strong persuasive argumentation techniques. The results show that using particular examples and analogies, ethical arguments, and logical reasoning are all heavily relied upon. In addition, interactive components like concessions and counterarguments are very important in helping people change their minds. This research advances our knowledge of persuasive communication in virtual spaces and provides useful advice for enhancing policy advocacy and deliberative discourse. The study emphasizes how crucial it is to use ethical and logical arguments along with practical examples while participating in drug policy discussions.

1. Introduction

Have you ever had your opinion changed or changed someone else's? Have you wondered how and why opinion change occurs? Changing someone's mind is one of the greatest challenges in daily life and communication science. The thinking and reasoning processes behind people's opinions may not always be intricate, yet altering these opinions remains difficult. Social media has revolutionized public opinion by providing platforms for widespread communication and engagement. However, these platforms can limit exposure to diverse viewpoints, promoting polarization and forming homogeneous groups, often referred to as echo chambers (Cinelli et al., 2021). In a healthy democracy, constructive dialogue and the exchange of diverse viewpoints are essential for informed decision-making and policy development. Exposure to differing viewpoints increases understanding of others' perspectives (Price et al., 2002). Thus, studying public opinion and specifically opinion change in online discussion environments concerning topics of societal importance is crucial.

Social media serves as a platform for public opinion formation (Couldry, 2012). Public opinion plays a crucial role in policy-making in democratic nations, as governments require public input into policy decisions (Matthew-Simmons, 2011). People elect individuals and parties reflecting their views, influencing policies and regulations. Given the increased polarization in online environments, the influence of political parties, and media agenda-setting, studying opinion change in policy-making is vital. In drug policy, often labelled a "morality policy," public opinion plays a particularly important role (Matthew-Simmons, 2011). MacCoun and Reuter (2001) argue that public opinion is a significant barrier to moving beyond the "war on drugs" and suggest that drug legalization involves balancing conflicting social and individual interests. Lenton and Ovenden (1996) propose that studying public opinion on drug policy can impact discussions and potentially lead to policy changes aligning legal frameworks with public sentiment.

Changing a person's opinion is a common goal in political and societal discussions and interpersonal communication. Research in social psychology suggests that persuasion drives—or at

least contributes to—opinion change during group discussions. Persuasion is the process of attempting to change attitudes. Westwood (2015) shows that persuasive argumentation is a consistent indicator of opinion change, especially when people expend cognitive effort to evaluate and consider message content. Argumentation is essential in decision-making, knowledge construction, and finding consensus (Zeng et al., 2020). Understanding argumentation processes can encourage individuals and society to engage with conflicting stances and consider the pros and cons of drug policy change.

One of the biggest challenges in studying opinion change is its observability and understanding the phenomena behind it. There is a lot to learn from online discussion environments, especially those that are deliberately organised for constructive discussions with a goal to challenge and even change one's view. One of the examples of such an online discussion environment is the Reddit community ''Change My View'' (CMV), where its members deliberately post their opinion on a variety of topics with a goal of having their view challenged by other users. Apart from being required to provide sufficient and appropriate argumentation for their opinion, users are also encouraged to acknowledge when their view has been changed by awarding a delta (Δ) to the user who has succeeded to do so. Additionally, this subreddit enforces rules against personal attacks and encourages civil discourse, which helps maintain a positive and productive environment for discussion. Even though such a deliberate discussion forum is not a realistic representation of the general population and can be seen as ''the best case scenario'' environment, studying CMV as an alternative can provide valuable insights into how structured debate can foster opinion change and enhance understanding of opposing viewpoints among individuals and groups.

Furthermore, this research focuses on a specific intergroup dialogue - drug policy, which hasn't been explored much in previous studies on opinion change and CMV, as well as general deliberate discussion studies, unlike topics such as climate change or politics. One concern about focusing on a specific topic could be that the dynamics of opinion change can be affected depending on the issues discussed. However, as discovered by Prinski and Zach (2019) in their study on attitude change on CMV, attitude change occurred at similar rates across a variety of different sociomoral and non-sociomoral discussion threads.

Considering all of the above, the aim of this research is to identify and analyze persuasive argumentation strategies leading to opinion change in drug policy-related discussions on Reddit's "Change My View" subreddit. By examining delta-awarded comments, this study seeks to understand effective strategies and thematic elements in these discussions, offering insights into successful persuasion in online debates about drug policy, legalization, and decriminalization. The method used is qualitative content analysis of delta-awarded comments in drug policy-related discussions to explore common themes and strategies. The research question is: **"Which persuasive argumentation strategies facilitate opinion change in drug policy-related discussions on Reddit's 'Change My View'?"** A qualitative content analysis using a codebook based on existing theories on persuasive argumentation and opinion change, as well as new themes discovered during the coding process, was conducted. Findings and interpretations are detailed in the results and discussion sections.

The findings of this study can provide both theoretical and practical guidelines for academic researchers, organizations and individuals. The findings can provide valuable knowledge for educational purposes for individuals who want to improve their argumentation skills in debates and use persuasive argumentation strategies in their daily or professional lives to foster more diverse, open-minded debate with a goal of finding consensus and considering opposing viewpoints. For organizations, the findings of the study could serve as an additional communication tool inside and outside their institution for the development of more constructive intergroup dialogue that can potentially lead to more positive changes in society.

Considering the limitations of this study as well as the more extensive and holistic approach used in the creation of its framework for the analysis of argumentation, this study can provide academic value for researchers in the communication science field by providing new qualitative insights into how different aspects of persuasive argumentation and their interplay contribute to opinion change. Additionally, the findings of this study can be used for further research in the context of CMV. Researchers can use these findings to further examine their validity and applicability by testing the framework from this study in other settings that include a more general population. For example, incorporate the findings into interventions within other online discussion forums with fewer

moderation practices that facilitate deliberate discussion or where people do not necessarily want their opinions challenged. That could result in a more refined and universal persuasive argumentation framework that leads to opinion change.

In the following section, relevant theories on deliberate discussion, persuasion, argumentation and opinion change will be discussed to seve as a basis for the content analysis of this research.

2. Theoretical Framework

Understanding how opinions can be changed is crucial in the context of public discourse, especially in online environments where debates on topics such as drug policy take place. This theoretical framework explores key concepts and theories relevant to the study of persuasive argumentation and reasoning strategies that lead to opinion change, which were used as a foundation for the structure of the analysis and development of the codebook. The framework is organised into several sections: deliberative discussion and opinion change, reasoning and argumentation in persuasion, theoretical models of persuasive argumentation, and a review of empirical studies previously conducted on CMV.

2.1. Deliberative Discussion and Opinion Change

Online platforms, such as social media and forums, have revolutionised the landscape of public opinion by providing spaces for widespread communication and engagement. However, these platforms also pose challenges, such as the formation of echo chambers where exposure to diverse viewpoints is limited (Cinelli et al., 2021). Familiarising individuals with perspectives that oppose their own can sometimes lead them to become more extreme in favouring their own position, eventually leading to polarization (Kuhn, Cummings & Youmans, 2020). In their study Kuhn, Cummings and Youmans (2020) explored opinion change dynamics focusing on individuals' own (rather than contrasting) opinions, while acknowledging and addressing unresolved issues and potential problems, limitations, and inconsistencies associated with those views. Even though findings of their study did not confirm their hypothesis that individual reflection on one's views leads to opinion change, the research shows that it does have an effect in deliberate discussion environments.

Deliberative discussions, characterised by structured and reasoned debate, play a significant role in facilitating opinion change. These discussions involve participants engaging in dialogue to exchange diverse viewpoints, with the goal of reaching a consensus or at least a better understanding of differing perspectives (Price et al., 2002). The process of deliberative discussion is integral to democratic decision-making and policy development, as it promotes informed and reflective opinions

among the public (Barabas, 2004). Studies have shown that exposure to differing viewpoints in deliberative discussions increases understanding of others' perspectives, which can lead to opinion change (Price et al., 2002). For instance, Mendelberg et al. (2013) found that the composition of deliberative groups and the topics they discuss significantly influence the outcomes of the deliberation process. Additionally, the framing of issues and the salience of these issues to the participants affect the kinds of arguments exchanged and the degree of opinion change observed (Druckman, 2004; Price et al., 2002). Walton (2006) emphasizes the dialectical nature of argumentation, where arguments are seen as part of a dialogue between two or more parties. This evidence shows that differences in the content of discussion result in different outcomes regarding opinion change, and that the environment in which the discussion takes place influences its content (Tan et al., 2016).

2.2. Reasoning, Persuasion, and Argumentation

According to Westwood (2015), the process of discussion changes cognitive evaluation and prioritization and that for persuasion to have maximal impact on attitudes, it should ideally be well justified by the sender and systematically processed by the receiver. Meaning that justified statements directed at a particular listener drive opinion change toward the attitude of the speaker. Persuasion and attitude change are associated with the effects of arguments on attitudes, while reasoning is linked with producing and evaluating the arguments (Mercier and Sperber, 2011). Mercier and Sperber (2011) describe reasoning as an argumentative device with a dual mechanism, that is both used to look for arguments supporting a certain view, explaining confirmation bias, and also favor views for which arguments can be found. Consequently, reasoning plays a crucial role in the processes underlying opinion change in argumentative environments. The main goal of argumentation, therefore, is persuasion, which has strong and consistent effects on opinion change in deliberative discussions and are larger and more consequential than both knowledge change and polarization (Westwood, 2015). This context is crucial for understanding how arguments function in real-world discussions (Walton, Reed & Macagno, 2008), including online communities like the "Change My View" (CMV) subreddit which are designed to facilitate constructive debate and encourage opinion change through reasoned argumentation and civil discourse.

2.3. Persuasive Argumentation Theories

To analyze persuasive communication systematically, this study relies on two foundational frameworks: Aristotle's modes of persuasion and Walton's argumentation schemes. Both frameworks emphasize the importance of credibility, emotion, and logic in persuasion and offer tools for systematically analyzing arguments (Rapp & Wagner, 2013).

2.3.1.   Aristotle's Modes of Persuasion

Aristotle's modes of persuasion—ethos, pathos, and logos—are foundational concepts in rhetoric and persuasive communication. These modes provide a framework for analyzing how arguments are constructed and how they impact an audience, which is particularly essential for analyzing persuasive comments in contentious issues like drug policy.

Ethos: The Appeal to Ethics

Ethos refers to the speaker's character and credibility, encompassing ethical appeal. Aristotle argued that a speaker's perceived integrity and ethical stance significantly influence their persuasiveness (Rapp & Wagner, 2013). In online discussions, ethos can be established by demonstrating a commitment to ethical principles, shared values, and moral considerations. For example, in drug policy debates, commenters may highlight the moral implications of criminalizing drug use, arguing from a standpoint of human rights and social justice. Research shows that arguments appealing to ethics and shared values are often more persuasive in changing opinions (Tan et al., 2016; Hunter & Horne, 2018).

Pathos: The Appeal to Emotion

Pathos involves engaging the audience's emotions. Aristotle believed effective persuasion often involves appealing to feelings, whether through sympathy, anger, fear, or joy (Barrett, 2014). In online discussions, pathos can be evoked through personal anecdotes, vivid descriptions, and emotionally charged language. For instance, a commenter discussing drug decriminalization might share a personal story about a family member harmed by punitive drug laws. Research indicates that

emotionally charged arguments are more likely to resonate with readers and contribute to opinion change (Tan et al., 2016; Öcal, Xiao, & Park, 2020).

Logos: The Appeal to Logic

Logos refers to logical reasoning and evidence supporting an argument. Aristotle emphasized that effective persuasion must be grounded in rationality and logical coherence (Rapp & Wagner, 2013). In online discussions, logos is demonstrated through statistics, factual data, and clear, logical argumentation. Arguments employing logos effectively often present well-structured points supported by empirical evidence. For example, a commenter advocating for drug policy reform might use data to show the ineffectiveness of current drug laws and the benefits of alternative approaches. Studies have found that arguments with strong logical foundations are particularly persuasive in fostering opinion change (Hunter & Horne, 2018; Öcal et al., 2020).

Tan et al. (2016) found that individuals who successfully persuaded others on the CMV subreddit frequently employed a combination of ethos, pathos, and logos, resulting in more compelling arguments. Similarly, Hunter and Horne (2018) noted that comments awarded deltas—indicators of opinion change—often incorporated all three rhetorical appeals.

2.3.2. Walton's Argumentation Schemes

Douglas Walton's theory of argumentation schemes (Walton, 2006) builds upon Aristotle's foundational work in rhetoric, providing a detailed framework for understanding and analyzing persuasive arguments in everyday discourse. These schemes highlight the mechanisms through which arguments persuade by appealing to logic, emotions, and ethical considerations. Walton identifies several argumentation schemes, such as arguments from cause to effect, analogy, authority, and consequences, each with a specific structure defining the relationship between premises and conclusions. Understanding these schemes helps critically evaluate persuasive arguments in online discourse.

Argument from Analogy

This compares one thing to another similar one, suggesting that if they share characteristics, they may share others. This argument is useful in drug policy debates, such as comparing alcohol regulations to potential regulations for other substances, arguing that successful alcohol regulation could inform similar approaches for cannabis or psychedelics.

Argument from Example

This uses specific instances to support a general claim. In drug decriminalization discussions, commenters might cite specific countries' policies and outcomes, such as Portugal's decriminalization policy leading to reduced drug-related deaths, to support the argument that decriminalization can yield positive public health outcomes.

Argument from Consequences

This reasons with the potential outcomes of an action or policy. It is crucial in drug policy debates, where social, health, and economic consequences are discussed. A commenter might argue that decriminalizing drugs could reduce incarceration rates, saving public resources and alleviating the societal burden of mass incarceration.

Argument from Authority

This relies on expert testimony in the field. Users might cite statements from addiction specialists or policy experts to support their views. For example, referencing a report from the World Health Organization could bolster the argument that decriminalization effectively reduces drug-related harm.

Argument from Cause to Effect

This reasons from a cause to its likely effect. In drug policy debates, a user might argue that

decriminalization would lead to reduced incarceration rates as fewer people would be arrested for drug possession, focusing on direct policy consequences.

Argument from Generalization

This draws a conclusion about a whole class based on a sample. For instance, a commenter might generalize that since some U.S. states have seen economic benefits from legalizing cannabis, all states would likely experience similar growth if they legalized it.

Argument from Exception

This acknowledges a general rule but argues for a specific case that doesn't follow it. For example, a commenter might argue that while recreational cannabis use should remain illegal, its medical use should be permitted due to therapeutic benefits for certain patients.

Slippery Slope Argument

This suggests that a particular action will lead to undesirable outcomes. It is often seen in debates against drug policy reform, where a commenter might argue that legalizing cannabis could lead to the legalization of more dangerous drugs, resulting in increased drug use and related harms.

Even though Walton's argumentation schemes can be seen as detailed strategies of Aristotle's modes of persuasion, some schemes, such as argument from consequences, can appeal to both logic and emotion, depending on context. For that reason, both Walton's argumentation schemes and Aristotle's frameworks were used for analyzing persuasive comments in this study.

2.4. Interactive Aspects of Persuasive Comments

In online discussions, particularly on platforms like CMV, the interactive aspects of persuasive comments are crucial for fostering opinion change. Interaction dynamics, including rebuttals, concessions, and counterarguments, significantly shape discourse and influence opinions. Öcal, Xiao, and Park (2020) argue that interactive argumentation, where users engage with each

other's viewpoints, ask questions, and provide evidence-based arguments, is crucial for understanding how opinions evolve in online discussions. Research by Hunter and Horne (2018) on CMV highlights that comments awarded deltas typically involve a high level of interaction, responding directly to the original post and engaging with other commenters while incorporating various argumentative strategies.

Rebuttals

These are fundamental in dialectical discourse, where participants challenge arguments' validity. Rebuttals can take various forms, such as pointing out factual inaccuracies or highlighting logical fallacies. Tan et al. (2016) note that successful persuaders on CMV often use rebuttals effectively to dismantle opposing arguments, enhancing the credibility of their viewpoints in alignment with Walton's (2006) argumentation schemes.

Concessions

These involve acknowledging an opponent's valid point. This strategy can enhance the persuader's credibility (ethos) by demonstrating fairness and a willingness to engage in balanced discussion. Concessions can help focus the debate on critical points of disagreement, making arguments more precise and targeted. Musi (2018) observes that concessions in online debates can lead to more constructive dialogues and facilitate deeper understanding of the issues.

Counterarguments

These present alternative perspectives and provide evidence to support them, going beyond merely refuting opposing views. This approach not only defends the persuader's position but introduces new dimensions to the discussion. Tan et al. (2016) found that effective counterarguments on CMV often incorporate elements of ethos, pathos, and logos, creating a comprehensive and persuasive narrative.

3. Methods

In this section, the relevant methods of this study will be discussed, specifically the research design and instrument, ethical considerations, data collection process, and the data analysis procedure with descriptions of the codes used, as well as the codebook.

3.1. Research Design and Instrument

The current study employs a qualitative content analysis method to explore the persuasive argumentation and reasoning strategies that facilitate opinion change in the subreddit "Change My View" (CMV), specifically focusing on discussions related to drug policy, legalization, and decriminalization. CMV subreddit provides a suitable environment for studying deliberative discussions and opinion change due to its design, which encourages well-reasoned arguments and civil discourse and enforces rules against personal attacks by use of a variety of moderation practices. The platform's delta system (Δ), used to acknowledge when the original poster (OP) changes their view, provides a clear indicator of opinion change, making it a valuable dataset for analysis (Cook & Worcman, 2019). By examining the dynamics of these discussions, researchers can better understand the mechanisms behind opinion change and the role of argumentation in shaping public opinion.

Unlike quantitative methods, which focus on frequency and statistical relationships, qualitative analysis captures the complexity and subtleties of persuasive discourse (Elo & Kyngäs, 2008; Boeije, 2010). Considering the focus on a specific topic as well as the aim of this research, which is to find common elements among the arguments that lead to an opinion change with a broad set of aspects to be considered, qualitative content analysis is particularly suitable for this research as it allows for an in-depth examination of the content (Boeije, 2010). Since the current research has an explorative rather than hypothesis-testing nature, the content analysis was partially based on the grounded theory, which allows for the emergence of new themes and discoveries that are more tightly connected to the data and represent the specific context of the analysis.

The study utilizes both inductive and deductive coding methods to enhance the comprehensiveness and quality of the analysis. Inductive coding allows new themes to emerge directly from the data, grounding the analysis in actual discussion content (Thomas, 2006). Deductive coding applies existing theoretical frameworks, such as Aristotle's modes of persuasion and Walton's argumentation schemes, to categorize and interpret the data (Walton, Reed, & Macagno, 2008). This dual approach is beneficial for this study as it allows for the identification of emergent themes from the data while also applying pre-existing theoretical frameworks. This flexibility ensures a comprehensive analysis that captures both the unique characteristics of the dataset and the established theoretical constructs (Mayring, 2014). Both approaches were used to maximize the quality and richness of the analysis. Even though existing theories and frameworks provide a reliable and solid base for content analysis of the comments, additional use of an inductive approach provides more perspective and in-depth insights specific to the context of this study.

3.2. Ethical Considerations

This study adheres to ethical guidelines concerning the use of publicly available online data. All data analyzed were sourced from the "Change My View" subreddit, a public forum where users are aware that their comments can be viewed by anyone. In order to protect the privacy and anonymity of the users, any identifying information, such as usernames or specific details that could trace back to an individual, has been anonymized. This approach ensures that the data cannot be linked back to the original posters. Additionally, the study follows the set of ethical guidelines established by the University of Twente BMS ethical committee (University of Twente, n.d.), stating that ''this research does not involve human subjects and, or the use of data (either new or existing), the collection and analysis of which might conflict with the interests of the individuals, groups or organisations to which these data pertain''. Content analysis of public websites and comments, such as the method of this research, complies with privacy and data protection regulations.

3.3. Data Collection and Corpus

The data sample for this study consisted of a set of comments sourced from an online discussion forum Reddit, specifically the subreddit ''Change My View''. Since this research focuses on a specific intergroup dialogue - drug policy, the corpus for data analysis has been narrowed down to limit the amount of collectable data and avoid complications potentially caused by the nature of the varying topics. The aim of this study is to explore argumentation used in the comments that changed someone's view, therefore the dataset was collected with a specific selection criteria. It included only comments awarded with a delta (Δ) symbol, indicating that the original poster (OP) acknowledged a change in their view. Furthermore, the dataset included only comments that came from discussion threads specifically concerning topics related to drug policy, with key words ''drug decriminalisation'' OR ''drug legalisation''. To access and retrieve data from Reddit, the Python Reddit API Wrapper (PRAW) was utilized. The Reddit API is a web-based interface that provides access to Reddit's data, including posts and comments. PRAW is a Python library that simplifies interactions with the Reddit API, making it easier to programmatically manage and extract data from Reddit.

The configured script to search for post titles in r/changemyview contained keywords "drug decriminalisation" OR "drug legalisation." This search was limited to the most recent and relevant 50 posts to maintain manageability and relevance. Within each identified post, the script scanned for comments with the delta value greater than 0. The script ensured that comments that were deleted or removed, were skipped. The Python script can be seen in the Appendix 1. The extracted comments were stored in a text file format, for further qualitative analysis. Lastly, the researcher manually checked every text file to further refine the dataset to fit the research aim, in other words, identify discussions that were focused specifically on drug policy reform as the main discussion topic, namely drug legalisation and/or decriminalisation, with the OP either supporting or not supporting it. The researcher omitted those that were generally related to the main topic discussed in the original post, however, focused more on specific aspects and effects of drug legalisation and decriminalisation, such as racism, politics, prison reform, specific substances, cases specific to only the USA, the war on

drugs. After the refinement process was completed, that left a total of 20 discussion threads and 216 comments for the final analysis. Finally, the documents each containing one discussion thread got uploaded to atlas.ti software for further content analysis.

3.4. Data Analysis

The data analysis and the coding procedure were performed using qualitative data analysis software Atlas.ti 24. The data analysis in this study was performed by systematically coding each unit of analysis, specifically, each delta-awarded comment using a codebook consisting of theories from the theoretical framework and themes that emerged during the open coding process. In qualitative research, coding refers to labelling segments of text to identify emerging themes and topics as well as connections between them to further explore phenomena within a broader set of data (Boeije, 2010).

This study specifically focused on analysing the argumentation within delta-awarded comments, rather than the full interaction between the commenter and the original poster (OP). Therefore, the analysis primarily examined the responses' argumentation without fully considering the original poster's complete argument and opinion text. To ensure the necessary context for analysing each comment, the study utilised the title of the discussion thread, which generally summarises the OP's opinion (e.g., "all drugs should be legalised"). This title provided a contextual framework for understanding and interpreting the comments. Additionally, if a comment directly addressed a specific point made in the full OP's view (indicated on Reddit by the symbol ">"), that specific point was also used as a reference to provide further context for the analysis. By employing this approach, the analysis could maintain a focused examination of the persuasive strategies used in the comments while still considering the essential contextual elements necessary for a sufficient understanding of the arguments presented.

As a first step, open coding was performed as a means to categorise data into codes that represent any new types of content emerging within the comments that were not covered by the theoretical frameworks used. The next step was categorising the inductive codes into groups, resulting in 2 new groups, additional to the 5 code groups created prior to inductive analysis using the

theoretical framework. Furthermore, the codebook was created based on the combination of the inductive findings, theoretical framework with an addition of a list of general topics concerning drug policy. Since the search criteria for delta awarded comments was delta score higher than 0, and while the majority of comments received 1 or up to 4 delta awards, there were a few comments that received substantially more delta awards from the other users. Which means that some comments are way more saturated, more proportionally significant to the total number of comments in the dataset So in order to increase reliability of the results section, the delta score of the comments were split into 2 groups ''delta score 1-6'' and ''delta score 6-max''. Consequently, the codebook contained 8 code groups and a total of 35 codes, which will be discussed more in detail in the upcoming paragraphs of this section.

3.5. Codebook and Code Group Description

The codebook was developed to capture the diverse range of argumentation and reasoning strategies used in delta-awarded comments and ensures a detailed analysis that incorporates relevant theoretical frameworks while allowing for the emergence of new, context-specific themes. Below is a justification and explanation of each code group and their contribution to answering the main research question:

3.5.1.   *Aristotle's Modes of Persuasion*

The inclusion of Aristotle's modes of persuasion—ethos, pathos, and logos—was based on their fundamental role in understanding persuasive communication. Ethos (credibility), pathos (emotion), and logos (logic) are critical in analyzing how commenters appeal to ethical principles, evoke emotional responses, and use logical arguments to persuade the audience. Categorizing comments using these modes allowed to systematically identify which types of persuasive appeals and their combinations are most effective in facilitating opinion change on drug policy issues.

3.5.2.   *Walton's Argumentation Schemes*

Walton's argumentation schemes were selected to categorize the various logical structures of arguments, which helped to dissect how commenters construct their arguments and the logical pathways they use to influence opinion change. These schemes, such as argument from consequences, analogy, authority, and cause to effect, provided a detailed framework for understanding the reasoning processes behind persuasive comments.

3.5.3. Interactive Aspects of Persuasive Comments

Interactive aspects, including counterarguments, concessions, and various types of rebuttals, were crucial for capturing the dynamic nature of the discussions. These codes were used to understand how commenters engage with opposing viewpoints, respond to challenges, and acknowledge valid points in others' arguments. This group of codes helps to analyze the interactive process of persuasion and how direct engagement and dialogue contribute to changing opinions.

3.5.4. Critical Evaluation Strategies

Critical evaluation strategies, developed inductively, were included to capture the evaluative techniques used by commenters. These codes, such as rhetorical questions, cost-benefit analyses, and reframing, highlight the ways in which commenters critically assess arguments and propose alternative perspectives. This code group is essential for understanding the depth of critical thinking and analysis present in the discussions. By examining these strategies, the study can identify how critical evaluation contributes to persuasive argumentation and the effectiveness of different evaluative techniques in changing opinions.

3.5.5. Type of Evidence Used

The inclusion of codes for types of evidence used—statistical, scientific, and historical-. Evidence-based reasoning is a key component of persuasive communication, as it supports claims with factual and authoritative backing. By categorizing the types of evidence, the study can assess the impact of empirical support on persuasive effectiveness. This approach provides insights into how the

use of different types of evidence influences the success of persuasive arguments in the context of drug policy debates.

3.5.6. Drug Policy Topics

The decision to include codes for drug policy topics was driven by the need to contextualize the arguments within the specific subject matter of the discussions. By categorizing comments based on themes such as public health, social impact, economic considerations, and criminal justice, the study can focus its analysis on the content relevant to the research question. These codes help to explore the substantive elements of the debate and provide additional context for understanding the arguments. This approach enriches the analysis by ensuring that the study captures the specific issues and concerns that are most salient in discussions about drug policy.

3.5.7. Scope of Perspective

Finally, the inclusion of codes for the scope of perspective—narrowing down or broadening the view—was aimed at analyzing the level of abstraction in the arguments. These codes allowed the study to differentiate between comments that provided a broad, holistic perspective and those that focused on specific aspects of the issue. Understanding the scope of perspective helps to analyze how commenters frame their arguments and the strategic choices they make in presenting their views. This approach provides additional layers of analysis, revealing the depth and breadth of the discussions.

By structuring the codebook in this manner, the analysis captures the complexity of persuasive argumentation in online discussions, providing comprehensive insights into the strategies that facilitate opinion change. Each code group contributes to answering the main research question by revealing different aspects of how persuasive arguments are constructed and how they influence opinions on drug policy issues.

Below, the complete codebook is presented, containing all code groups, codes, their detailed descriptions as well as examples from the data.

Table 1
Codebook

Code group	Example quote	Description	Example
0. Delta score range	0.1. Delta score 1-5	The comment has a delta score of 1,2,3,4 or 5	''Score: 25''
	0.2. Delta score - 6-max	The comment has a delta score of of 6 and above	''Score: 4''
1. Aristotle's modes of persuasion	1.1. Logic	This strategy uses reasoning, facts, and logical arguments to persuade the audience. It often involves citing statistics, using cause-and-effect reasoning, and presenting well-structured arguments that follow a logical progression.	''Thing is, harm reduction cannot be practised when drugs are not decriminalized or legal. So, harm goes up.''
	1.2. Emotion	This strategy seeks to evoke an emotional response from the audience to persuade them. It can involve storytelling, vivid imagery, or language that elicits feelings such as sympathy, anger, or fear.	''Drug addicts hurt just about all their family members and friends constantly.''
	1.3. Ethics	This strategy involves invoking shared values, ethical principles, or moral beliefs to persuade the audience. It often appeals to justice, fairness, rights, and the greater good.	''If someone is hurting no one but themselves, it is neither society's responsibility nor their right to "force" anyone to do anything.''
2. Walton's argumentation schemes	2.1. Argument from consequences	This argument asserts that a particular action should not be taken because it will lead to negative outcomes. Basically, any negative consequences related to changing drug policy.	''There are many allocation problems involved with legalizing all drugs and how it impacts various groups implicated in such a change.''
	2.2. Argument from analogy	This scheme draws a comparison between two different things, suggesting that what is true for one is also true for the other due to their similarities/differences.	''However this alternative solution is like communism. Looks great on paper but the reality is less than great.''
	2.3. Argument from example	This scheme uses specific examples to support a general claim or argument. It's NOT a comparison (analogy) used to support a claim.	''Gasoline is dangerous and harmful. It explodes at temperatures below freezing.''
	2.4. Argument from authority	This argument relies on the credibility or expertise of an authority figure or institution to support a claim.	''I recommend the book [High Society by Ben Elton].''
	2.5. Argument from cause to effect	This scheme establishes a cause-and-effect relationship between two events or phenomena. It can often be a fallacy, confusing cause and effect related to drug policy changes.	''This explains why there are huge disparities between urban/suburban drug arrests despite similar rates of drug use.''

	2.6. Argument from (extreme) generalisation	An argument from when a conclusion is drawn about a whole population based on a sample that is not large enough or not representative. This type of argument often leads to stereotypes and incorrect assumptions because it takes a small set of examples and uses them to make a broad claim.	''Meth destroys your face. [P][SEP] Bath salts induces zombie-ism.''
	2.7. Argument from exception	This scheme argues that a general rule should not apply in a specific case due to particular circumstances or that an exceptional case can lead to general outcomes.	''Would you include poisons such as Botulinum toxin in your "decriminalized drugs" category?''
	2.8. Slippery slope argument	This (fallacy) argument assumes that a relatively small first step will lead to a chain of catastrophic events. (Will be used less than and together with argument from consequences, since this is a specific fallacy.)	''Do you want to see people casually shooting heroin or snorting cocaine in public?''
3. Interactive Aspects of Persuasive Comments	3.1. Counterargument	A counterargument is an argument that opposes or challenges a claim made by an opponent. It involves presenting a different perspective or highlighting potential weaknesses in the original argument (that's not a direct rebuttal). Basically, any argument against the view, not necessarily attacking specific claims, just providing a different view or perspective.	''However, here is a counterargument: by legalising drugs, you open them to the usual forces of free market competition.''
	3.2. Concession	A concession in an argument is a strategy where the speaker or writer acknowledges a valid point or a certain aspect of the opposing viewpoint.	''To begin this, I agree with the fact that drugs such as marijuana should be legalized''
	3.3. Rebuttal - factually wrong	This rebuttal strategy points out factual inaccuracies in the opposing argument.	''There's a simple point that makes your whole argument useless: You base it on the premise that you can FORCE addicts to quit.''
	3.4. Rebuttal - illogical	This rebuttal strategy highlights logical fallacies in the opposing argument, demonstrating flaws in reasoning.	''I don't disagree with your ultimate claim, but I definitely disagree with your reasoning.''
	3.5. Rebuttal - lack of evidence	This rebuttal strategy points out the absence of supporting evidence in the opposing argument.	''You don't have to do LSD, or any other psychedelic, but there's literally more evidence every day showing the potential therapeutic benefits of these compounds.''
	3.6. Rebuttal - unacceptable consequences	This rebuttal strategy highlights the negative and often unintended consequences of the opposing argument. show that whilst the point might be superficially correct – the consequences of their argument are worse than any benefit that they claimed would follow.	''Decriminalization is the WORST proposed solution to the drug war. If you decriminalize but don't legalize the supply side, you are just inviting hundreds of thousands of additional fentynal-caused OD deaths.''

4. Critical Evaluation Strategies	4.1. Rhetorical/ critical question	A question posed for effect rather than to elicit an answer. It is used to emphasise a point or to provoke thought in the audience. Also to challenge an argument or viewpoint, encouraging deeper analysis and consideration of the issues involved.	''Why legalise the really addictive, poisonous or dangerous drugs?''
	4.2. Cost-Benefit Analysis	This strategy involves evaluating the costs and benefits of a particular action or policy to determine its overall value or effectiveness. It weighs the positive outcomes against the negative ones to make a reasoned decision.	''I read about the effects of decriminalization in Portugal, but I'm not convinced the positive outweigh the negative.''
	4.3. Focus on Alternative Solutions	This strategy highlights other potential solutions to a problem, suggesting that the current approach may not be the best or only way to achieve the desired outcome, suggests a plan.	''The best solution IMO is to avoid the things that make humans go for substances in the first place.''
	4.4. Reframing	Reframing involves changing the way a problem or issue is presented to shift the perspective and potentially alter the conclusions drawn about it. It often involves redefining the context or implications of the issue.	''My biggest problem with your argument is the use of the word force. If you really want to help people you have to take away the force.''
	4.5. Open-ended doubt	This strategy raises questions or doubts about the certainty or effectiveness of an argument or policy without necessarily providing definitive answers. It encourages critical thinking and further investigation, mostly as a closing sentence or conclusion of uncertainty.	''There is no easy answer unfortunately.[P][SEP]''
5. Type of evidence	5.1. Evidence - statistical	Statistical evidence involves using numerical data and statistics to support an argument.	''Somewhere between [60-70% of patients relapse](http://americanaddictioncenters.org/rehab-guide/success-rates-and-statistics/) from drug addiction therapy.''
	5.2. Evidence - scientific	Scientific evidence is derived from research studies and scientific methods. Used to support arguments with findings that have been tested and peer-reviewed. Also, well-known facts about drugs and their harm. Doesn't have to have a link to a study per se.	''Studies have shown that drug treatment lowers the recidivism rates of addicts.''
	5.3. Evidence - historical	Historical evidence involves using historical facts, events, and precedents to support an argument. This type of evidence can provide context and show how similar issues have been handled in the past.	''I think heroin and coke were outlawed 1914 right before the liquor ban in 1918, we got alcohol back tho obviously.''

6. Drug policy topics	6.1. Public health	This theme focuses on the impact of drug use and drug policy on the health of individuals and communities. It also addresses prevention, treatment, and harm reduction strategies.	''If too much of either kind is being taken by many people, those people will have no way of being helped in the event that they become seriously wounded.''
	6.2. Social	This theme examines the social implications of drug use and drug policies, including their impact on families, communities, and social cohesion, as well as social stigma.	''And since that is what you want: Stability of society, substitution therapy is the only thing you should go for.''
	6.3. Economical	This theme explores the economic costs and benefits of drug policies, including their impact on public spending, healthcare costs, and the economy at large (revenues, taxing..)	''While this does mean that more people will be seeking help for their addiction, you have to also wonder if the cost is worth the outcome.''
	6.4. Criminal justice	This theme examines how drug policies affect crime rates, imprisonment, and law enforcement practices.	''There should never be *jail* sentences for drug possession, let alone prison sentences.''
	6.5. Policy and regulation	This theme focuses on the formulation, implementation, and effectiveness of drug policies and regulations.	''Why shouldn't it be decriminalized if there is intent to sell?''
	6.6. Political	This theme examines the political dimensions of drug policy, including the role of government, political ideologies, and international relations.	''In short, drug treatment is expensive, and the only people that think it works are those with a political agenda to continuing the process.''
7. Scope of perspective	7.1. Perspective - narrow down	Narrows down the overall perspective of the Original poster (OP) to a specific, more narrow view regarding the issue discussed.	''If someone on a dangerous drug, such as bath salts or PCP, did something bad (assault, theft, whatever) to someone else as a result of the drug use, how do you think that should be handled?''
	7.1. Perspective - broader view	Puts the view or opinions of the OP into a more broad, holistic perspective. Puts things in perspective in a bigger picture	''We know what life is like with the War on Drugs in full action. It is not pretty.''

4. Results

In the following paragraphs, the results of the data analysis will be presented systematically according to the structure of the codebook considering its according code groups and codes, while prioritizing the most significant and relevant findings to the research question. A total of 216 comments were coded and analyzed using the Atlas.ti software. For the analysis, a total of 35 codes were used that were divided into 8 different code groups. Frequencies and co-occurrences of the analyzed codes will serve as a basis for the reporting of the results presented below.

4.1. Aristotle's Modes of Persuasion

Table 2
Aristotle's modes of persuasion code frequency per groups of delta scores

	0.1. Delta score 1-5 (n=191)	0.2. Delta score 6-max (n=25)
	%	**%**
1.1. Logic (n=191)	88% (n=168)	92% (n=23)
1.2. Emotion (n=34)	15% (n=29)	20% (n=5)
1.3. Ethics (n=66)	29 % (n=55)	44% (n=11)

Out of the 216 coded comments, the ***"Logic"*** code was the most frequently used, appearing in 191 comments (88%) for comments awarded delta scores 1-5 and 23 comments (92%) for comments awarded delta scores 6-max. This high frequency underscores a strong reliance on logical reasoning and factual arguments to persuade the audience. The predominance of the code *"Logic"* suggests that users of the CMV subreddit use arguments that are grounded in facts, statistics, and coherent reasoning. Logical arguments provide a clear, structured approach to debating complex subjects, allowing commenters to present their points of view in a way that is both persuasive and challenging.

The *"Ethics"* code appeared in 55 comments (29%), for comments awarded with delta scores 1-5 and 11 comments (44%) for comments with delta scores of 6-max. Ethical arguments suggest invoking shared values, ethical principles, or moral beliefs to appeal to the audience's sense of right and wrong. The use of ethical appeals underscores the relevance of moral considerations in discussions about drug policy, legalization, and decriminalization. This suggests that commenters might feel the need to highlight the ethical dimensions of drug policy debates, perhaps to emphasize the impact of drug policies on individuals and societies.

The *"Emotion"* code was present in 29 comments (15%) for comments awarded with delta scores 1-5 and 5 comments (20%) for comments awarded with delta scores 6-max. Emotional appeals were less common but still played a significant role in persuasion. These comments aimed to evoke feelings and emotional responses from the audience, mostly by narrating hypothetical stories related to the consequences of addiction.

4.2. Walton's Argumentation Schemes

Table 3
Frequencies of Waltons argumentation schemes

	0.1. Delta score 1-5 (n=191)	0.2. Delta score 6-max (n=25)
	%	%
2.1. Argument from consequences (n=118)	54% (n=104)	56% (n=14)
2.2. Argument from analogy (n=37)	17% (n=33)	16% (n=4)
2.3. Argument from example (n=84)	38% (n=73)	44% (n=11)
2.4. Argument from authority (n=11)	5% (n=10)	4% (n=1)
2.5. Argument from cause to effect (n=17)	8% (n=16)	4% (n=1)
2.6. Argument from (extreme) generalisation (n=26)	11% (n=21)	20% (n=5)
2.7. Argument from exception (n=8)	4% (n=8)	0% (n=0)
2.8. Slippery slope argument (n=11)	5% (n=9)	8% (n=2)

The analysis of delta-awarded comments on CMV subreddit focused on identifying the persuasive argumentation strategies used by the commenters. Walton's argumentation schemes provided a valuable framework for this analysis, from which 8 argumentation schemes were used.

The results show that the most frequently used scheme was the *"Argument from consequences"*, which appeared in 104 (54%) for comments awarded with delta scores 1-5 and 14 (56%) for comments with delta scores 6-max. Most of the time, this scheme was used to highlight the negative consequences of drug policy change, specifically in instances where all drugs would be decriminalised. This high frequency suggests that CMV users often emphasise the potential outcomes of impactful actions such as drug policy change to persuade their audience. Reddit active users appealed to the audience's feeling of caution and accountability by using this approach to emphasise the dangers linked to greater drug accessibility, potential spikes in illicit drug use rates, and the social consequences of such developments. Some examples of argument from consequences are:

D2: ''If all drugs are decriminalized in the manner you stated, we get greater usage since people my be more willing to try them. It will be more easy to get since people are more likely to buy knowing they can't get in trouble for mere possession. It would also grow the illegal supply side which we don't want to see. Just look at weed, we're seeing more babies born with THC in their system.'[P|SEP]*''*

D1: ''Just to play devil's advocate, if you legalize dangerous drugs in a state with Universal Healthcare, you may see a net cost increase for that state. While this does mean that more people will be seeking help for their addiction, you have to also wonder if the cost is worth the outcome.[P|SEP]*''*

The *"Argument from Example"* was the second most common scheme, found in 73 comments (38%) for delta scores 1-5 and 11 comments (44%) for delta scores 6-max. This scheme involves using specific instances to support general claims, making arguments more relatable and concrete. Commenters often provided examples of different drugs that would not yield any benefits by being decriminalized or legalized. This use of specific examples helps to situate the argument in real-world contexts, making abstract policy discussions more accessible and understandable to the audience. Some of these examples are:

D5: ''Some drugs like marijuana are probably perfect candidates for legalization but there might be others where the costs outweigh the benefits.''

D3: ''However, there are some drugs that have absolutely no redeeming value in terms of medical use, can be incredibly dangerous to actually create, and are extremely addictive. Meth is one example of this. There are types of amphetamines that are absolutely useful medically, but they are created in controlled circumstances for much more specific purposes. ''

The **"Argument from Analogy"** appeared in 33 comments (17%) awarded with delta scores 1-5 and 4 comments (16%) rewarded with delta scores 6-max, making it the third most used argumentation scheme. This scheme involves drawing comparisons between different scenarios, which helps simplify complex ideas and create a relatable context for the audience. Commenters frequently used other countries' drug policies or substances already legal as analogies to support their claims. This approach translates complex policy issues into familiar terms, making arguments more accessible and convincing. Some examples are:

D2: ''However this alternative solution is like communism. Looks great on paper but the reality is less than great…''

D7: ''I would also recommend researching Portugal's drug policy and noting how it's success is contributed not only to it's legal policies but also to the cultural shift in how both the drugs and the people who used them went from being demonised to being empathised.''

The **"Argument from (extreme) Generalization"** was employed in 21 comments (11%) for delta scores 1-5 and 5 comments (20%) for delta scores 6-max. This pattern of reasoning involves making generalizations based on limited evidence, which can sometimes oversimplify complex issues. Using this strategy, commenters frequently formed generalizations regarding drug coverage, such as claiming that a particular drug will have a major effect on society or projecting the effects of an isolated medication to all drugs. This tactic may be helpful if it adopts an assertive stand, but it may

also have potential risks if the presumptions are not well-backed up by evidence. The use of extreme generalizations in this study highlights the tendency of some commentators to rely on broad and sometimes exaggerated claims to strengthen their arguments and bend public opinion on drug policy issues. Some examples are:

D1: "Currently, if someone wants heroine or cocaine, they have to jump through many hoops and pay a lot of money to do it, and most people avoid that. By making them legal, EVERYONE will have access to it, and probably at a cheaper price, too."

D3: "What about drugs like psychedelics? I had a friend argue that they should be sold over the counter. I could only imagine all the homeless in town tripping balls in a gutter for 12 hours after only spending a few dollars on a tab of acid. I've seen educated well off people lose their minds on these substances."

The remaining argumentation schemes that were used in less than 10% of the comments are ***"Argument from Authority", "Argument from Cause to Effect", "Argument from Exception",*** and ***"Slippery Slope Argument".*** Specifically, ***"Argument from Authority"*** appeared in 5% of comments with delta scores 1-5 and 4% of comments with delta scores 6-max. *"Argument from Cause to Effect"* was found in 8% of comments with delta scores 1-5 and 4% of comments with delta scores 6-max. *"Argument from Exception"* was present in 4% of comments with delta scores 1-5 and 0% of comments with delta scores 6-max. The *"Slippery Slope Argument"* appeared in 5% of comments with delta scores 1-5 and 8% of comments with delta scores 6-max.

Considering that all of those schemes, except **''argument from authority''**, are logical fallacies, it makes sense that frequency for these codes is low. That is most likely due to most people in the CMV community having above-average argumentation skills and knowledge, open-mindedness, and self awareness compared to an average person. Additionally, the CMW community principal and supporting guidelines facilitate people to avoid logical fallacies when trying to engage in deliberate discussions, which also could explain the low frequency of those schemes in this research context. The minimal use of ''argument from authority'' could be explained by users' high

reliance on their own logical reasoning, confidence and extensive, structured argumentation skills without the need to use arguments from authority as their main persuasion tool.

4.3. Interactive Aspects of Persuasive Comments

Table 4

Interactive Aspects of Persuasive Comments

	0.1. Delta score 1-5 (n=191)	0.2. Delta score 6-max (n=25)
	%	%
3.1. Counterargument (n=95)	42% (n=80)	60% (n=15)
3.2. Concession (n=35)	15% (n=28)	4% (n=7)
3.3. Rebuttal - factually wrong (n=6)	3% (n=5)	4% (n=1)
3.4. Rebuttal - illogical (n=8)	4% (n=7)	4% (n=1)
3.5. Rebuttal - lack of evidence (n=12)	5% (n=10)	8% (n=2)
3.6. Rebuttal - unacceptable consequences (n=24)	12% (n=23)	4% (n=1)

The analysis of delta-awarded comments on the Change My View subreddit also focused on the interactive aspects of persuasive comments, particularly looking at counterarguments, concessions, and various types of rebuttals.

The most frequently used aspect was the *"Counterargument"*, which occurred in 80 comments (42%) for comments awarded with delta scores 1-5 and 15 comments (60%) for delta scores 6-max. This high frequency indicates that commenters tend to engage directly with the original poster's arguments, leading to perspectives not considered by the OP. For example, by providing counterarguments, the commenters challenge preconceived notions, encourage deeper exploration of the topic, and encourage the critical thinking of the audience.

The ***"Concession"*** aspect was present in 28 comments (15%) for delta scores 1-5 and 7 comments (4%) for delta scores 6-max. This strategy involves acknowledging some validity in the opposing argument before presenting their own perspective. The use of concessions indicates a balanced approach to dialogue, where commenters recognize the value of opposing viewpoints and establish some sort of general agreement before they are presented with conflicting information. This approach can be particularly effective in fostering open and respectful dialogue, as it demonstrates a willingness to understand and integrate a certain perspective.

Various types of ***"Rebuttals***'', including those addressing *factual errors*, *illogical arguments*, *lack of evidence*, and *unacceptable consequences*, were not used frequently, each appearing in fewer than 10% of the comments. The infrequent use of rebuttals shows that commenters on the Change My View subreddit opt to interact with opposing perspectives through counter arguments and concessions rather than at once attacking the logical structure or proof of the original arguments. This choice for a greater optimistic and much less confrontational form of engagement aligns with the subreddit's purpose of encouraging thoughtful and respectful discourse. Some examples of counterarguments used are:

D1: ''However, here is a counterargument: by legalizing drugs, you open them to the usual forces of free market competition. That means advertisers promoting drugs aggressively, producers working on more addictive strains, and retailers competing to have the lowest price point. ''

D14: ''However, I don't think that giving someone the free pass for hard drugs (manufactured drugs like cocaine, heroin, etc.) is the right call in any situation. These drugs are highly addictive and can destroy families''

4.4. Critical Evaluation Strategies

Table 5
Critical Evaluation Strategies

	0.1. Delta score 1-5 (n=191)	0.2. Delta score 6-max (n=25)
	%	%
4.1. Rhetorical/ critical question (n=70)	34% (n=65)	20% (n=5)
4.2. Cost-Benefit Analysis (n=29)	14% (n=27)	8% (n=2)
4.3. Focus on Alternative Solutions (n=58)	26% (n=50)	32% (n=8)
4.4. Reframing (n=74)	32% (n=62)	48% (n=12)
4.5. Open-ended doubt (n=12)	6% (n=12)	0% (n=0)

The *"Rhetorical/Critical Question"* code appeared in 65 comments (34%) with delta scores 1-5 and in 5 comments (20%) with delta scores 6-max. This strategy involves asking questions that do not require a direct answer but rather encourage the audience to reflect deeper and think about the issue. Additionally, this code was applied to comments where the OP's view was questioned regarding a specific aspect of their opinion or required a clarification. The frequent use of this approach highlighted its effectiveness in stimulating readers' critical thinking, making it a valuable tool in persuasive discourse on drug policy. Additionally, it was used as a powerful tool for engaging the audience's attention and encouraging them to critically evaluate the arguments.

The *"Focus on Alternative Solutions"* code appeared in 50 comments (26%) with delta scores 1-5 and in 8 comments (32%) with delta scores 6-max. This strategy mainly focuses on trying to find other potential solutions to the problem being discussed. Its considerable frequency implies

that it is effective in stimulating more in-depth conversation, which is necessary for considering various perspectives in the context of drug policy debates.

The *"Reframing"* code was found in 62 comments (32%) with delta scores 1-5 and in 12 comments (48%) with delta scores 6-max. By using this method, the issue was presented from an entirely new perspective or in a different light. The high usage rate, particularly among higher delta scores, indicating an effect alter views and enhances the argument's persuasiveness.

Less than 15% of comments utilised the "**Cost-benefit analysis"** and **"Open-Ended Doubt"** codes, suggesting their limited applicability in the research. While open-ended doubt was used to emphasise the uncertainty and complexity associated with drug policy changes, mostly at the end of the comments and raised questions without providing conclusive answers, cost-benefit analysis evaluated positives and negatives of specific aspects of drug legalisation, for example regarding the medical systems.

4.5. Type of Evidence

Table 6
Type of evidence

	0.1. Delta score 1-5 (n=191)	0.2. Delta score 6-max (n=25)
	%	%
5.1. Evidence - statistical (n=11)	5% (n=10)	4% (n=1)
5.2. Evidence - scientific (n=18)	8% (n=15)	12% (n=3)
5.3. Evidence - historical (n=22)	10% (n=19)	12% (n=3)

Less than 15% of comments used statistical, scientific, or historical evidence, meaning that on CMV people rely on other persuasive strategies more, such as logical reasoning and strong arguments without necessarily having to provide evidence. Comments containing **"Statistical Evidence"** involved using numerical data to support a certain claim. For example, an argument against

decriminalisation included percentage rates on drug-related crime in a given area or specific drug abuse statistics.

D7: ''Why do you limit the criminality at drugs? There are many harmful things some people partake in namely food, at least partially causing 4 of the [10 leading causes of death in the U.S.] (https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm) (nearly 1.5 million deaths annually)''

A little more common was **"Scientific Evidence",** which referred to findings from scientific research on the effects of various psychoactive substances and their effects on different aspects surrounding drug use, as well as expert opinions to reinforce their claims.

D5: ''As the article itself states, the drop in drug use/deaths likely was due to a big cultural shift in how addiction is looked at more than the *decriminalization*.''

The most frequently employed type of evidence to support one's argument was **"Historical Evidence"** and using which commenters referred to specific examples from the past related to drug policy implementation and their consequences, drawing parallels with the current discussion.

D20: ''well this was sort of tested during the opioid epidemic where opioids weren't exactly legal but you could take them. it resulted in a mass death and sort of destroyed many people and families. decriminalizing drugs would sort of remove any penalty that could actually prevent people from using them.''

4.6. Drug Policy Topics

Table 7
Drug policy topics

	0.1. Delta score 1-5 (n=191)	0.2. Delta score 6-max (n=25)
	%	%
6.1. Public health (n=129)	57% (n=109)	80% (n=20)
6.2. Social (n=85)	39% (n=75)	40% (n=10)
6.3. Economical (n=20)	10% (n=19)	4% (n=1)
6.4. Criminal justice (n=36)	16% (n=31)	20% (n=5)

6.5. Policy and regulation (n=131)	62% (n=118)	52% (n=13)
6.6. Political (n=9)	4% (n=8)	4% (n=1)

4.7. Scope of Perspective

Table 8
Scope of perspective

	0.1. Delta score 1-5 (n=191)	0.2. Delta score 6-max (n=25)
	%	%
7.1. Perspective - narrow down (n=66)	31% (n=59)	28% (n=7)
7.1. Perspective - broader view (n=88)	39% (n=74)	56% (n=14)

The code group ''scope of perspective'' indicating whether the comment provided a broader or more narrowed view in relation to the OP's opinion, occurred at similar rates across all comments to which the code was assigned to. Generally, the comments that were shorter in length provided a more narrow-down approach by focusing on a specific aspect, such as drug cartels or rehabilitation. While longer comments that contained multiple paragraphs and a wider variety of perspectives, often framed the drug policy debate as a broad, multifaceted issue that requires a more holistic view. In some cases the opposite was also true, shorter comments provided a broad perspective on OP's view and longer comments focused too much on very specific aspects meaning that on CMV people choose their scope of perspective relative to the scope of perspective presented in the Original Post.

5. Discussion

This discussion examines the implications of the findings on persuasive argumentation strategies leading to opinion change in drug policy-related discussions on Reddit's 'Change My View'. The study aimed to identify those strategies by qualitatively analysing delta-awarded comments, revealing key themes and argumentation tactics, persuasive and interactional elements that users employ in the discussions. The main research question of this study was: "Which persuasive argumentation strategies facilitate opinion change in drug policy-related discussions on Reddit's ''Change My View?".

Further sections will interpret the results and findings of this study in attempts to answer the research question, discussing the most important findings from the results section as well as correlations and possible explanations for those findings., Additionally this section will discuss theoretical and practical implications, limitations and suggestions for future research as well as reflect upon the methods and instruments used in this study.

5.1. Interpretation of the Findings

This study provides new insights into the role of specific argumentation schemes in online discussions. The frequent use of arguments from consequences and examples suggests that practical, outcome-based reasoning and relatable examples are particularly effective in persuading others in the context of drug policy debates. Additionally, the integration of interactive aspects such as counterarguments and concessions highlights the importance of engaging directly with opposing viewpoints to foster opinion change.

The analysis found that logical reasoning and ethical appeals were predominant in delta-awarded comments, supporting the notion that well-structured, fact-based arguments are highly persuasive. This aligns with Westwood (2015), who emphasised the importance of cognitive effort in evaluating persuasive messages. The use of logical arguments and ethical appeals supports the Elaboration Likelihood Model (Petty & Cacioppo, 1986), which suggests that both central and

peripheral routes to persuasion are effective depending on the audience's motivation and ability to process the message.

Unique to this study was the significant use of arguments from consequences and examples, indicating that commenters often emphasise the potential outcomes of drug policy changes and provide specific instances to support their claims. This approach helps make abstract policy discussions more concrete and relatable, enhancing the persuasive impact.

5.2. Application for Practitioners

The practical implications of this study are relevant for practitioners involved in policy advocacy, public relations, and other fields where persuasive communication is crucial. The study's findings can help practitioners develop more effective communication strategies by highlighting the importance of combining logical reasoning with ethical considerations and real-world examples. For instance, policy advocates can use these strategies to craft more compelling messages that resonate with their audience and encourage constructive debate.

Recommendations for Real-World Contexts

1. Using logical arguments supported by statistics and factual data to enhance credibility.
2. Incorporating ethical appeals to align with the audience's values and moral principles.
3. Providing specific examples and considering the practical consequences of proposed policies to make arguments more relatable and concrete.
4. Engaging directly with opposing viewpoints through counterarguments and concessions to foster respectful and productive dialogue.

5.3. Limitations and suggestions for suture research

However, the study has several limitations. Firstly, his study solely focused on the delta awarded comments and not the whole didn't explore back and forth dialogue between the commenter and the OP, so findings of this study do not fully consider the whole context and the impact of its various

aspects on the specific factors that led to opinion change. The findings of the current study took only the delta awarded comment and assumed that the whole comment as a standalone factor changed the view, when it could have been the progression of the whole conversation thread or very specific aspect of the whole comment that made an impact. Luckily there have been various studies conducted on CMV, specifically analysing the whole discussion threads, however employed quantitative as opposed to qualitative method. Additionally, the specific focus on drug policy-related discussions may limit the generalizability of the findings to other topics.

Future research could address these limitations by expanding the analysis to include other topics and platforms. Exploring the role of demographic factors in persuasive effectiveness could provide a more nuanced understanding of how different audiences respond to various argumentation strategies. Additionally, further studies could investigate the impact of different moderation practices on the nature of online discussions and opinion change.

6. Conclusion

It is very crucial to study opinion change however also difficult, especially in dialogical context due to it being hard to observe if and when and why the opinion change occurs as well as due to observers' presence bias. The observation needs to happen in natural conversations without people knowing that they're being observed without violating people's privacy and the opinion change needs to be observable (indicated). Anonymous online discussion forums with clear and applied moderation practices are perfect for studying opinion change. Ofc it's hard to know exactly which aspect of the comment changed the Ops view, if the comment is long and maybe only 1 argument changed Ops view in a specific aspect. But finding what all comments have in common can provide valuable insights and practical knowledge for people to use in their daily life to at the very least increase chances of people changing their minds during discussions.

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Appendix

Appendix 1

"During the preparation of this work the author used ChatGPT in order to generate ideas and identify spelling and grammar mistakes. Moreover, ChatGPT was used in order to obtain guidance in working with Atlas.ti software. After using this tool/service, the author reviewed and edited the content as needed and takes full responsibility for the content of the work."

Appendix 2

Search Log and Criteria

Search Log

Date	Database	Search string	Total hits	Remarks
2024-05-01	PubMed	"persuasive argumentation" AND "opinion change" AND "qualitative content analysis"	120	Many relevant articles; focuses on medical and psychological contexts.
2024-05-02	JSTOR	"persuasive argumentation" AND "opinion change" AND "subreddit"	85	Found historical and contemporary discussions on persuasion.
2024-05-06	Google Scholar	"persuasive argumentation" AND "change my view" AND "Reddit"	200	Broad range of articles, including grey literature.
2024-05-09	PsycINFO	"opinion change" AND "argumentation" AND "delta awarded comments"	95	Focused on psychological impacts of argumentation.

| 2024-05-17 | Scopus | "qualitative content analysis" AND "persuasive argumentation" AND "change my view subreddit" | 150 | Provided multidisciplinary perspectives. |
| 2024-05-22 | Web of Science | "qualitative content analysis" AND "persuasive argumentation" AND "social media" | 175 | Found articles on social media impacts. |

Criteria

Search matrix / Search terms

Key concepts	Related terms	Narrower terms	Broader terms
Persuasive argumentation	Persuasion, Debate, Rhetoric	Specific techniques (e.g., ethos)	Communication
Opinion change	Attitude change, Belief revision	Short-term change	Social influence
Qualitative content analysis	Thematic analysis, Discourse analysis	Manual coding	Qualitative research methods
Subreddit	Online forum, Social media platform	Specific subreddit names (e.g., CMV)	Internet communities

Databases

Database	Why do you want to use this database, what do you expect to find
PubMed	Covers medical and psychological literature; expects to find studies on psychological impacts.

JSTOR	Provides historical and contemporary discussions on various topics, including persuasion.
Google Scholar	Broad range of articles, including grey literature.
PsycINFO	Focused on psychological impacts of argumentation and opinion change.
Scopus	Multidisciplinary perspectives, expects to find various articles on qualitative analysis.
Web of Science	Covers a wide range of scientific disciplines, expects to find research on social media impacts.