

[EN] Guidelines for Annotating Elementary Units in ChangeMyView

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Abstract

This instruction provides guidelines for *ChangeMyView* annotation. An annotator participating in this study should translate and annotate based on these guidelines. This instruction comprises three sections. First, the research background is explained. Next, the target dataset to be annotated is described. Finally, detailed annotation guidelines are described.

1 Background

1.1 Argument Mining

Argument mining is an emerging research field in natural language processing that focuses on extracting claim-premise arguments from argumentative discourses. Argument mining is a multi-disciplinary area related to logic, natural language, machine learning, and rhetoric. Argument mining is also deeply related to a syllogism of ancient Greek.

This study focuses on argument mining to extract arguments from various texts such as web arguments in fora. In future, argument mining will be applied to various tasks, such as document summarization, argument search engines, dialog systems, and any other argumentative document analyses.

In argument mining, a claim is a statement that something is true or factual although some may not believe it, whereas a premise is an idea or theory on which a statement or action is based. In addition, the claim and premise structure is referred to as an argument. An argument comprises several components and includes a claim supported or attacked by some premises (Palau and Moens, 2009; Stab and Gurevych, 2014; Peldszus and Stede, 2013). In many cases, the premise is the reason for the claim; thus, an argument holds the relation “(premise) \rightarrow therefore \rightarrow (claim).” The most basic argument is shown as follows:



Figure 1: Basic argument structure

In this context, the division into a premise and claim in the sentence “*Some people with ADHD don’t take these medications specifically because they’ve already developed coping mechanisms to help increase their productivity.*” is as follows:

Raw	<i>Some people with ADHD don’t take these medications specifically because they’ve already developed coping mechanisms to help increase their productivity.</i>
Claim	<i>Some people with ADHD don’t take these medications specifically</i>
Premise	<i>they’ve already developed coping mechanisms to help increase their productivity</i>

In the above example, the sentence is divided by the token “*because.*” A token or phrase used to organize a discourse into segments is referred to as a discourse marker. Other discourse marker examples are given as follows:

$$\frac{\begin{array}{c} \text{<claim> as <premise>}. \\ \text{Since, <premise> I believe that <claim>}. \\ \text{<premise>. Hence, <claim>}. \end{array}}{}{}$$

In addition, there are cases wherein discourse markers do not exist, even when some premises support a claim.

Well maybe that was a bit harsh, but I think I am insignificant. The universe is much bigger than anything a person can imagine; I don't think that anything I will ever do will matter because of this. This picture reaffirmed how I felt (<http://imgur.com/vyOiKDu>.)

In the example, the claim statement (“I think I am insignificant”) is supported by three premises (“(i) The universe is much bigger than anything a person can imagine”, “(ii) I don't think that anything I will ever do will matter”, and “(iii) This picture reaffirmed how I felt (<http://imgur.com/vyOiKDu>.)”). Each premise forms a support relation, as shown in Figure 2. The argument has a sequential structure, wherein a series of reasons and a conclusion in which each premise is supported by one reason referred to as *aserial argument*.

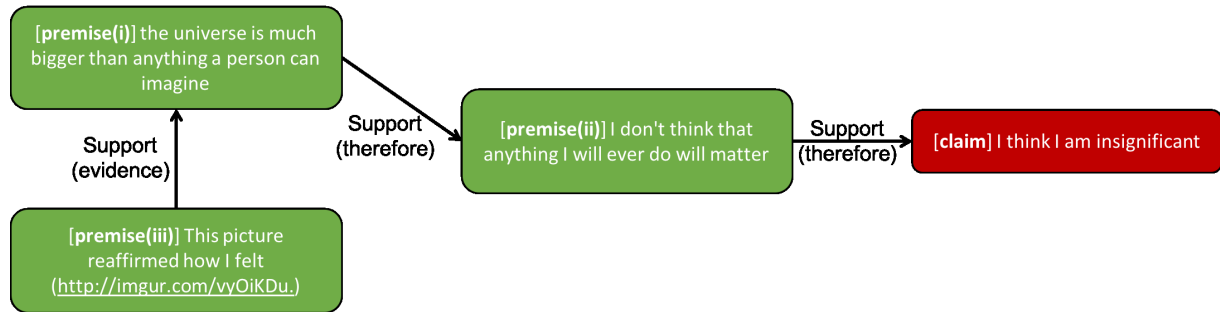


Figure 2: Example argument with four units (three premises and one claim)

2 ChangeMyView

ChangeMyView (CMV) is an online discussion forum in Reddit. CMV's official wiki¹ describes the forum as follows:

CMV is a subreddit dedicated to civil discourse, and is built around the idea that in order to resolve our differences, we must first understand them. We believe that productive conversation requires respect and openness, and that certitude is the enemy of understanding. That's why CMV is the perfect place to post an opinion you're open to changing. We're not looking to host aggressive debates, or encourage judgment, but help each other understand different perspectives.

A view is a way of considering or regarding something: an attitude or opinion. CMV is a place to discuss and change a specific opinion.

The CMV system can be described as follows.

1. You post the a view, and it is called an original post (OP). You must explain the reasoning behind your view, not just what that view is. Also, it is required 500+ characters and submission titles must adequately sum up your view.
2. Your purpose is to change the view throughout the reply to the OP. Also, direct responses to a CMV post must challenge at least one aspect of OP's current view, unless they are asking a clarifying question.

¹<https://www.reddit.com/r/changemyview/wiki/index>

3. Those who changed the OP's view is awarded a Delta (Δ) as a reward.² Also, the user who posts the OP must also include an explanation of the change along with the delta.

We refer to a post that has successfully changed the OP's view (awarded Δ) as *positive*, and a post that did not change the OP's view as *negative*. The following examples show an OP and positive and negative posts.

[OP title]

I do not love my parents. CMV

[OP]

I have caring parents. They supported me for a long time. But when I look at them objectively, they are average human beings. I am 25, and at this stage in my life, they add little value to my life. Why should I keep up with them just because they invested in me? The past is a sunk cost. This extends beyond just parents. Why should I blindly love any of my relatives? Some of them are bad people. If we all blindly love and support other people just because we're related, I feel it leads to a lot of irrational decisions. Please change my view.

[Positive]

Unfortunately there may come a point, where your life will get fucked up. Maybe it's an accident, maybe something else. Maybe financial problems, or a psychosis, everything is possible. Who will stay with you, support you, when they get nothing in return? Friends? Even if you have really good friends it would surprise me. Probably they will leave quiet, some sooner, the best ones later. But they will leave, because they have their own lives that can exist without you. A SO? Maybe, maybe not. When you are very lucky then maybe they do. But often this kind of bond is not strong enough. Your parents will stay. They put up with all your shit in your childhood (You said they did care for you, so I'll assume it was a healthy relationship between you and them). You are what will stay from them when they die. You are simply the most important thing for them. So, you will always can rely on them. If you are not able to love them for what they have already done for you, love them for what they might do.

[Negative]

*I can't convince you to *love* your parents. It doesn't work that way. What I can encourage you to do is to think twice about cutting them out. Frankly, it's healthy (to a point) to push them away; if they've done their job half-well, you'll be ready to face things on your own. And everyone's parents are bound to have a different sense of the world. But if their sense of things is warped, don't forget that yours might be too. As Nietzsche once said, every philosophy is the philosophy of some stage of life.. Parenthood is not a reciprocal arrangement. You are not bound to care about them the same way they care about you. But you may understand someday when you are a parent. Try and imagine it. For now, you can't force yourself to care. Much less, none of us can do that for you. But think of it as a favor to people who have done a lot for you. Call them regularly, just to say hello and catch up. Later on you'll be glad you did, and in the meantime, you'll be giving them a comfort that you will someday appreciate.*

In the example, the OP included the view “*I do not love my parents*” with an explanation and reasoning for that view. In the positive post, the author claims that parents are the only people the user can always rely on.

We annotate the triple (*OP, positive, negative*) for each thread. This study uses a subset of a CMV dataset (Tan et al., 2016) for annotation.

² Δ is used in mathematics to represent change.

3 Argument Mining in ChangeMyView

CMV is not a debate forum; it is a forum for discussion and conversation to understand various views. Therefore, we expect that argument mining can shed light on reasons that make web arguments persuasive. Therefore, this study applied argument mining to CMV.

Stab et al.(Stab and Gurevych, 2017) annotated a persuasive essay for argument mining, and they defined the argumentative components as the *major claim*, *claim*, and *premise*, where the *major claim* is the consistent claim of an essay writer. The *claim* is the writer’s assertion, and the *premise* is the reason for the claim. Although we can apply the scheme presented by Stab et al. (Stab and Gurevych, 2017) to CMV, we expect that applying only this scheme will be ineffective because essays and fora have different characteristics. Therefore, we apply the original scheme, which considers the characteristics of CMV. The characteristics of our scheme are summarized as follows.

- We propose inner-post annotation to differentiate each post so that we may consider each post an independent document.
- We feature elementary units, such as propositions with rhetorical statements, facts, and personal experiences, because a CMV user typically provides a claim with a statement of what action(s) should be taken, rhetoric for effective persuasion, or states something based on personal experiences.
- We annotate the dataset at the token level (rather than sentence level annotation). Park et al.(Park and Cardie, 2018) annotated an online forum at the clause level; however, it is important to annotate at the token level to analyze fine-grained units. In addition, there may be cases wherein a sentence comprises both premises and a claim.
- If we employ only inner-post annotation, we cannot determine the types of interactions that occur between posts. Therefore, we also propose inter-post annotation, which is omitted here and will be the focus of future work.

Here, we briefly describe the annotation process in consideration of above characteristics.

- (i) First, translate posts into Japanese to standardize recognition because most annotators are non-native speakers.
- (ii) Extract and classify five elementary units (four propositions (i.e., Policy, Value, Fact, and Testimony) and a Rhetorical Statement).

To prevent mistakes and remove annotator bias as much as possible, we assign two or more annotators to each thread to ensure redundancy. In addition, we integrate and create a gold standard for each annotation process. The annotation process is summarized visually in Figure 3. This figure includes future annotation plans, i.e., inner-post and inter-post relations.

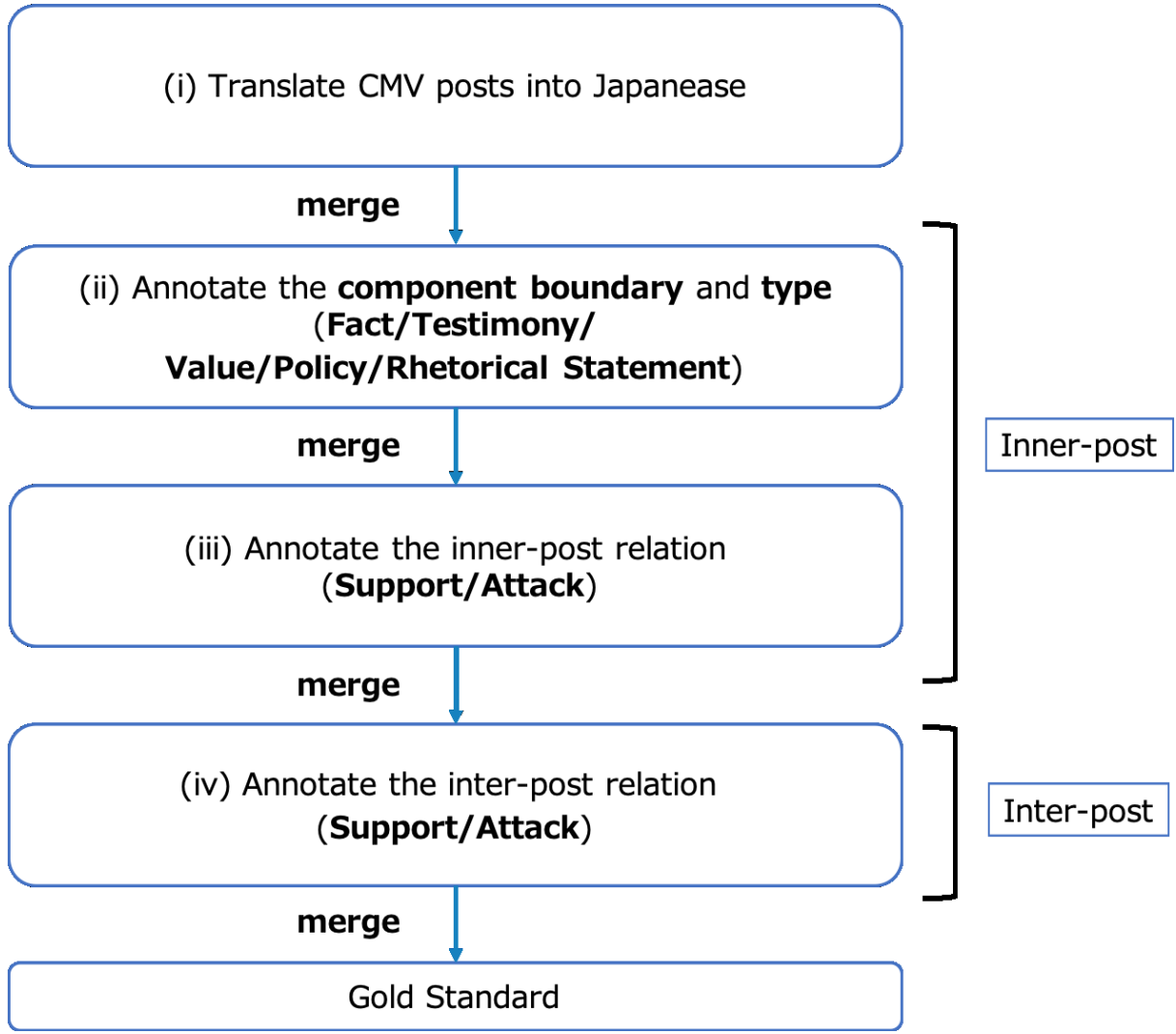


Figure 3: Annotation process at a glance

In the merging process, we essentially merge automatically. First, (i) translation is performed with one translator and a validator to improve the reliability of the translation result. (ii) Three annotators annotate the boundaries and types of elementary units, and the result are merged automatically by majority voting. (iii) Two annotators annotate the relations between elementary units, and the results are merged by an expert annotator who should refer to and merge the results of step (ii). Note that this will be the focus of future work. This step was not performed in the current study. (iv) Three annotators annotated the types of interactions between posts. This will also be the focus of future work (not conducted in the current study). The detailed annotation guidelines are described in the next section.

4 Regulation for Translation

In the translation step, a post is translated to retain the original meaning as much as possible. The translation regulations are as follows.

1. For complicated sentences, employ a loose translation that is easy for Japanese readers to understand.
2. Various web-related symbols and tags may be included; however, if they do not affect interpretation of the original text, such symbols and tags are not included in the translation (e.g., symbols such as “</p><p>” do not make sense).

3. Do not translate moderator or bot comments, such as “> *Hello, CMV users! This is a footnote from your moderators. We would just like to remind you of a couple of things....”
4. Obviously recognizable misspellings should be corrected and then translated. For example, “Theer is no reason” should be considered “There is no reason”.
5. The format of symbols and tags should be maintained intact as much as possible.

5 Regulation for Elementary Unit Boundary and Type

In the inner-post annotation, we extract elementary units at the token level for each OP, positive post, and negative post. Stab et al.(Stab and Gurevych, 2017) annotated the types of components as a major claim, a claim, and a premise; however, we use more detailed definitions of unit types. Five types of elementary units are defined in our annotation.

1. **Fact** is an objective proposition expressing or dealing with facts or conditions. A Fact has a truth value that can be verified with objective evidence.
2. **Testimony** is an objective proposition about the author’s personal state or experience.
3. **Value** is a subjective proposition containing a value judgment without describing a corresponding action or actions.
4. **Policy** is a subjective proposition for a specific course of action.
5. **Rhetorical Statement** is a subjective statement (may not be a proposition) that describes a value judgment indirectly and is intended to affect and influence readers.

Using these subdivided elementary units, we can analyze CMV arguments in detail. In addition, using fine-grained types, such as the Policy and Value, rather than only using the type of a claim, it is possible to distinguish whether the proposition insists that some action be taken. Therefore, we can characterize the difference in the nature of the subjective proposition. We also aim to analyze the rhetorical characteristics that appeal to emotions as well as logic using the Rhetorical Statement type because rhetorical questions, e.g., “*Do you think it will actually work?*”, are typically used in discussion fora. Furthermore, we can distinguish whether the argument is based on facts or personal experiences by defining the Fact and Testimony types rather than simply defining the premise type.

Example sentences for each elementary unit type are given in the following.

If you are not able to love them for what they have already done for you, love them for what they might do (policy) .

The above example should be labeled as a Policy because it clearly proposes a specific course of action.

Unfortunately there may come a point, were your life will get fucked up (value).

The above example should be labeled as a Value because it contains a value judgment without describing what should be done.

So what was the critical difference? (rhetorical statement)

The above example should be labeled as a Rhetorical Statement because it indirectly describes a value judgment and is intended to elicit emotion.

I’ve heard suggestions of an exorbitant tax on ammunition (testimony) .

This example should be labeled as a Testimony because the proposition cannot be proven as fact and is based on personal experience.

5	Interestingly enough, they did exactly this in the U.K. about thirty or so years ago.	Fact
6	It all seems logical and practical and like it should work. Then they decided that legally, ownership was satisfied if you could own something at all.	Value Fact
7	So handguns were turned in in huge numbers and you were allowed to keep rifles and shotguns.	Fact
8	Then it was shotguns only.	Fact
9	Then you could only keep them if you had a proven use for them like on a farm or similar.	Fact
11	Thirty years later and the inventors of most of our modern arms and the people who helped us the most in WWII are completely castrated. Firearms are essentially gone and crime is out of control.	Fact Fact
13	So what was the critical difference?	Rhetorical_Statement
14	As was pointed out, it's that your argument pre-supposes that firearms are a privilege and not a right.	Value
15	You go into the creation of the list with a view that logically will lead you down this path. But let's get into each statement/idea.	Value Rhetorical_Statement
16	Because some are good, and some are not.	Value
17	And this isn't really abot how you set up the argument so much as the individual points.	Rhetorical_Statement
19	1 - This sounds great.	Value

Figure 4: Example of annotations for elementary unit boundaries and types

This is almost the law in some states already (fact).

The example above should be labeled as a Fact because the proposition contains an objective fact that can be validated. For better understanding, we illustrate an annotation example using the brat tool in Figure 4.

Basic Regulation

Only boundaries that are relevant to the five types (Fact, Testimony, Value, Policy, and Rhetorical Statement) are annotated. This rule means one should not annotate unrelated sentences (e.g., “Hi.”, “View changed, deltas awarded”, and “Change my view.”), which are examples of fixed phrases and bot and moderator comments.

Recall that component annotations are made at token level (\neq sentence-level). In other words, the boundary from token (i) to token (j), where $i < j$ in a document should be labeled appropriately.

Proposition Rule (except Rhetorical Statement)

The boundary of the four propositions (Fact, Testimony, Value, and Policy) should cover a complete sentence. A complete sentence always contains a verb and should express a complete idea that makes sense independent of any other statement. To test whether the candidate is a complete sentence, “*It is true (that)*” can be added to the beginning of the proposition to determine whether the sentence is grammatically correct. Consider the following example.

I have caring parents.

This a proposition (and can be a Testimony) because “*(It is true that) I have caring parents*” is grammatically correct.

Consider the next example.

caring parents.

This cannot be a proposition because it is not a complete sentence.

Rhetorical Statement Rule

In the case of a Rhetorical Statement, the boundary is annotated even with an incomplete sentence. For example, the boundary of “*Friends?*” in the sentence “*Who will stay with you, support you, when they get nothing in return? Friends?*” is an incomplete sentence because it does not contain both a noun and a verb. However, even in this case, this statement is annotated as a Rhetorical Statement because the description uses a rhetorical question.

Boundary Rule

All appropriate adverbs and adjectives should be included in the boundary if they contribute to the meaning. For example, the adverb “*Recently*” in the sentence “*Recently, argument mining is attracting much attention, and thus ...*” must be annotated because the token contributes to the proposition’s meaning.

Shell language Rule

Ignore a *Shell Language*, i.e., “*I am strongly convinced that*”, “*I agree that*”, “*For example*” and “*As can be seen*” except when the shell language contributes to the meaning. In other words, the phrase “*For example*” in the sentence “*For example, <testimony>*” should not be annotated because it does not contribute semantically to the proposition. In addition, shell language should not be annotated in the following cases: “*I agree that <proposition>*” and “*I am strongly convinced that <proposition>*.” Consider the following example.

Put simply the idea is put forward that any religion that calls for the sharing with and converting of others not in your religion means that your deity unfairly punishes certain people (value) .

In this case, the phrase “*Put simply*” should not be annotated because it does not contribute semantically to the component.

However, negative expressions, such as “*I disagree with the view that ...*” should be annotated because the shell language of “*I disagree*” contributes to the logic. If this phrase is not included, the author’s perspective can be considered a positive stance for the <value>. Therefore, annotate just like “*I disagree with the view that ... (value)*”.

Inference Step

An elementary unit should be annotated in a single sentence. This rule eliminates annotations across multiple sentences. However, the sentence should be divided if it contains an inference step, i.e., a claim-premise(s) pair in a single sentence. Consider the following example.

The universe is much bigger than anything a person can imagine (value); I don’t think that anything I will ever do will matter because of this (value).

In this context, the sentence is divided into two elementary units because an inference step is included in “*The universe is much bigger than anything a person can imagine*” and “*I don’t think that anything I will ever do will matter because of this*” can form a claim-premise relationship.

In addition, a sentence should not be divided when the given sentence does not include any inference steps.

Sentence Division in Parentheses

When parentheses or double quotations appear in a sentence, the sentence should be divided into appropriate elementary units when the description in parentheses is independent and forms a complete sentence. Consider the following example.

They put up with all your shit in your childhood (value) (You said they did care for you (fact) , so I’ll assume it was a healthy relationship between you and them (value)).

In this case, the sentence should be divided into three units (two units are bound by parentheses) because there are punctuation symbols immediately after the end of the parentheses and the sentences in parentheses are independent and complete. Note that annotations should not include bracket symbols when splitting a sentence.

Also, make a concerted effort to promote such permit ownership to our youths (say, training leading up to a full permit at adulthood) and as part of self-defense programs and so on (policy) .

Here, the boundary is annotated without a division because there are no symbols immediately after the end of the parentheses and the description in parentheses is an incomplete sentence.

Punctuation Rule

Punctuation marks at the end of an elementary unit should not be included in the boundary. The following example shows proper annotation in this case.

People should stop pronouncing English loanwords as if they're speaking their native language (policy).

An exclamation mark, such as “?” and “!,” should be included in the boundary if such expressions contribute to the semantic meaning or rhetorical statement. Consider the following example.

After all, why spend a bunch of money putting something on the internet that nobody has the technical ability to receive? (rhetorical statement)

Recall that the shell language of “After all” does not contribute to the elementary unit; thus, it should not be included in the boundary.

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