

# Annotation Protocol: Linguistic Polarity of Finding Sentences

The following definition, guidelines, and examples govern our annotation of Finding Sentences as having either “positive polarity” or “negative polarity”. In English, positive polarity (an affirmative assertion) is the default value, and an expression (sentence or clause) has negative polarity only if an appropriate linguistic cue signals negative polarity. Therefore, in practice, we need a protocol only for identifying negative polarity, and we assign positive polarity if the sentence or clause has no such cues for negative polarity.

## Part I: Definition

*Linguistic* or *grammatical* polarity is a concept that is distinct from, but related to, the *logical* concept of negation. Used in the strictly linguistic or grammatical sense, “affirmation” and “negation” are the two values of “polarity” for a linguistic expression (usually a sentence or clause). In general, in English, an affirmative (positive) form of linguistic expression is used to assert the validity or truth of the statement, while a negative form asserts the falsity of the statement or (equivalently) the truth of the statement’s logical negation.

Linguistic polarity therefore relates to the *meaning* of an oral or written *expression*. A declarative linguistic expression is distinct from the proposition that it expresses, and the *linguistic polarity* of a sentence or clause is distinct from the *truth-value* of the proposition being asserted. Assume, for example, that John has exactly one sister. We can formulate various sentences, classify them with respect to linguistic polarity, and evaluate the truth-value of the proposition being asserted when using the sentence:

Sentence	Linguistic Polarity	Truth-value of Asserted Proposition
“John has one sister.”	Positive (affirmative)	True
“It’s not the case that John has one sister.”	Negative	False
“John has three sisters.”	Positive	False
“John does not have three sisters.”	Negative	True

English has many ways to express a grammatical negation (many expressions we can use to assert that something is not the case). And if the author or speaker does not use some meaningful linguistic cue that signals grammatical negation, then the default meaning is affirmation or positive polarity. Therefore, in practice, only negative polarity needs to be substantiated or warranted by the occurrence of a negation cue.

Note that the task is to annotate linguistic polarity only for “Finding Sentences”. A Finding Sentence is a sentence that primarily states an authoritative finding of fact. The essential function of a finding of fact is to state whether some condition or requirement of a legal rule has been satisfied.

A necessary condition for being a Finding Sentence is that it primarily states an authoritative decision about whether a specific legal-rule condition or requirement is satisfied in the case. A Finding Sentence, or some portion of the Finding Sentence, must assert that a legal condition or requirement has been satisfied or not, given the evidence in the case. For example, if the Finding Sentence is “*the Board finds that the veteran currently has PTSD*,” then the words “*the Board finds that*” warrant our concluding that the Board has made a finding of fact that “*the veteran currently has PTSD*.”

If we consider the legal-rule conditions as specifying the issues (propositions) to be decided by the trier of fact, then a Finding Sentence can have one of two polarity values with respect to any particular legal proposition. If the text expressing the finding of fact has “positive polarity,” then it states that the rule condition has been satisfied in the case. If the text expressing the finding of fact has “negative polarity,” then it states that the rule condition has not been satisfied in the case. The example above, “*the Board finds that the veteran currently has PTSD*,” states a positive finding on the legal-rule requirement that the veteran must prove that she has “a present disability”.

## Part II: Guidelines for Manual Annotation

Polarity in our sense is linguistic or grammatical – it is about the meaning of the sentence, based on its wording. In analyzing the content and nature of a Finding Sentence, it is useful to employ attribution theory. Stated in general, attribution theory tries to identify any attribution relations within texts. Such relations typically have three main elements: the attribution cue, the attribution subject, and the attribution object. The “attribution cue” is the word or phrase that signals the attribution, and which provides the lexical grounds (warrant) for our making the attribution. The “attribution subject” is the actor to whom we attribute acceptance of a proposition as being true. The “attribution object” is the propositional content of a sentence or clause that we attribute to the attribution subject, and which states what the actor accepts as true.

In order to be classified as a Finding Sentence, the text of the sentence and/or its context must warrant our attributing at least one proposition (the finding-attribution

object, or simply “finding”) to the finder of fact (in these datasets, the BVA) as an authoritative determination of fact in the case. The finding-attribution cue is the portion of text that warrants our attributing the proposition to the BVA (the finder of fact). For example, in the Finding Sentence “*the Board finds that the Veteran has PTSD*,” the finding-attribution subject and cue “*the Board finds that*” warrants our attributing to the Board the finding that “the Veteran has PTSD”. When manually annotating a sentence to be a Finding Sentence, an important check is determining that it contains at least one finding-attribution relation.

One difficulty with labeling an entire Finding Sentence for linguistic polarity is the grammatical and logical complexity of some Finding Sentences. While every Finding Sentence must warrant our attributing at least one finding to the trier of fact, some Finding Sentences might state multiple findings, and some of those might be positive, and some negative. Or Finding Sentences might state additional propositions that are not findings (e.g., those stating evidence by attributing testimony to a witness, or those attributing legal rules to appellate courts).

For example, the following is a complex Finding Sentence from BVA decision Number 1715225: “*As the Board has found the March 2014 VA examination to be the most probative medical evidence of record, and the VA examiner did not find such disorder to be present diagnostically or to have been present in service, the Board finds that service connection for such a disorder is not warranted.*” This sentence consists of multiple clauses, each with a different rhetorical role. The first dependent clause (“*As the Board has found the March 2014 VA examination to be the most probative medical evidence of record*”) states the reasoning of the Board in evaluating the probative value of the evidence. The second dependent clause (“*as ... the VA examiner did not find such disorder to be present diagnostically or to have been present in service*”) is a statement of the evidence attributed to a VA examiner. The main clause is the actual finding of fact, and it contains all three elements of a finding attribution. Moreover, the main clause states a negative finding of fact (“*service connection for such a disorder is not warranted*”).

The following suggested annotation steps help an annotator to implement these insights.

### Suggested Annotation Steps

1. Read the sentence in its entirety, to determine its overall meaning.
2. Confirm (or determine) that it is a Finding Sentence, by identifying at least one finding-attribution cue, related to a finding-attribution subject (sometimes implicit in BVA decisions), and to a finding-attribution object (the propositional finding itself).
3. If the word “not” or any expression of grammatical negation occurs in the finding-attribution cue, then the finding sentence or clause is more likely to have a negative polarity - see the highlighted examples below, particularly for the normal

form. For example, linguistic cues that warrant attributing a negative finding to the Board include phrases involving negations of variations on: “the Board finds that”; “the evidence reveals that”; “the preponderance of the evidence establishes”; “the probative evidence demonstrates that”; “the weight of the evidence indicates that”; and “the evidence is at least in equipoise as to whether”.

4. If the word “not” or any expression of grammatical negation occurs in the main verb phrase of the finding-attribution object, then that finding attribution is more likely to have a negative polarity - see the highlighted examples below, particularly for the normal form.
5. If the Finding Sentence contains only a single finding (finding-attribution object), then the polarity of that finding becomes the polarity of the Finding Sentence.
6. If the Finding Sentence is grammatically complex in that it contains multiple clauses, then parse the sentence into its clauses and apply the above three steps to every clause that contains a finding attribution. Determine the polarity of each finding individually.
7. If the Finding Sentence contains more than one finding clause, then use the following guidelines to assign a single polarity to the Finding Sentence as a whole:
  - a. If all of the findings have the same polarity, then that polarity is assigned to the Finding Sentence.
  - b. If the findings have different polarity values, then we balance two potentially competing considerations.
    - i. First, other things being equal, we classify the sentence polarity as negative if the sentence contains at least one negative finding, because we want the predictive ML model to learn to identify negative-polarity cues as features.
    - ii. However, if the principal finding is positive, assign the sentence a positive polarity, because we do not want the predictive model to misclassify the polarity of a finding that is critical to the decision.

## Part III: Lists of Examples (Organized into 3 lists)

**List A: Normal Form** -- A span of text in “normal form” is one for which we are highly confident that it provides evidence of a finding attribution with negative polarity, and this confidence is based on some linguistic cue from the text of the sentence or clause. Also, a span in “normal form” has a certain fixed format or pattern, which we find recurring numerous times. These should be the easiest types of spans for a human annotator or computer software to identify.

Words highlighted in **yellow** provide the cues for negative polarity.

**EXAMPLES of finding sentences or clauses with negative polarity:**

The Board does **not** find that a psychiatric disorder was incurred in or aggravated by service.

[NOTE: in the example above, the negation term is within the finding-attribution cue, "*The Board does **not** find that*".]

However, the Board finds that the preponderance of the evidence does **not** show a relationship between depression and service.

[NOTE: the negation term is within the finding-attribution cue, "*the Board finds that the preponderance of the evidence does **not** show*".]

Thus, the Board finds the Veteran does **not** have PTSD.

[NOTE: the negation term is within the finding-attribution object, or the proposition being attributed, "*the Veteran does **not** have PTSD*".]

In summary, the preponderance of the evidence shows that the Veteran does **not** have a psychiatric disorder that is related to his military service.

[NOTE: the negation term is within the finding-attribution object, or the proposition being attributed, "*the Veteran does **not** have a psychiatric disorder that is related to his military service*".]

Therefore, the Veteran does **not** have two of the required elements needed to establish a claim for service connection for PTSD pursuant to 38 C.F.R. § 3.304(f).

[NOTE: the negation term is within the finding-attribution object, or the proposition being attributed, "*the Veteran does **not** have two of the required elements needed*".]

**List B: Linguistic Transforms of Normal Forms** -- A span of text that is a "linguistic transform" of a "normal form" is one for which we are also highly confident that it provides evidence of a finding attribution with negative polarity, and that confidence based on some linguistic cues from the text of the sentence. However, while a span in "normal form" has a certain recurring format or pattern, a "linguistic transform" has a more unusual linguistic pattern. Yet there might be some linguistic rules that would make it easier for computer software to identify them. So here we are looking for merely grammatical variants of a normal form.

Words highlighted in **yellow** provide the cues for negative polarity.

### **EXAMPLES of finding sentences or clauses with negative polarity:**

That doctrine **is inapplicable** in the instant case because the preponderance of the evidence **is against** the Veteran's claim.

Notably, there is **no credible evidence** that any of the in-service events complained of by the Veteran, aside from the death of the recruit, actually occurred.

The evidence of record **does not support** a finding that the Veteran had a psychiatric condition in service other than the two drug-related diagnoses from 1978.

**No disability** for which compensation may be paid (i.e, a disability which was not a drug induced psychiatric disorder) **was manifest** in service.

The stressor is **unrelated** to service.

The Veteran's PTSD **could not have been aggravated** by his military service insofar as this implies that PTSD was present prior to, and during, the Veteran's service.

There is **no indication** of a diagnosis of PTSD conforming to DSM-IV here.

Given the foregoing, there is **no credible supporting evidence** that the claimed in-service stressors occurred.

Nevertheless, the preponderance of the evidence **is unfavorable** to the claim.

As noted above, there is **no credible supporting evidence** that the claimed in-service stressors occurred and **none** of the mental health treatment records that document a diagnosis of PTSD were linked to the alleged stressors.

[NOTE: The above sentence contains two finding attributions, hence the two separate cues for negative polarity: the linguistic transform of the norm “*no credible supporting evidence*” and the aberrant form “*none ... were linked*”.]

As the preponderance of the evidence **is against** the claim, the benefit of the doubt rule **is inapplicable**.

[NOTE: Likewise, this sentence has two finding-attributions, with two separate expressions of negative polarity.]

The Board further finds that service connection for PTSD is **not** warranted under 38 C.F.R. § 3.304(f) because the Veteran was **not** diagnosed with PTSD during service, did **not** engage in combat with the enemy, did **not** experience a stressor related to fear of hostile military or terrorist activity, was **not** a prisoner-of-war, and did **not** sustain an in-service personal assault.

[NOTE: This sentence contains two finding attribution relations, and many negative polarity cues. However, it is important to read through the entirety of the sentence just to make sure that a positive point is not thrown into the mix - which is not the case above.]

Therefore, the presumption of soundness is **not rebutted**.

[NOTE: This sentence is linked to the legal condition that rebuts the Presumption of Soundness, and this sentence asserts that the rebuttal condition is not satisfied, as evidenced by the sentence's negative polarity.]

The Board finds **no competent medical evidence** linking the Veteran's son's illness to her military service, and **no indication** that the Veteran's post-service life stressors, which have clearly been shown to be the cause of her current psychiatric disorder, are related to her service in any way.

**List C: Aberrant Forms of Normal Forms** -- Some spans of text have very unusual linguistic structures, but we are still fairly confident that they provide a finding attribution with negative polarity. This confidence might be based more on the context than on linguistic cues within the sentence itself (e.g., co-references to words or phrases in other sentences). These we will have to study to determine what evidence we have that they probably provide a finding attribution with negative polarity.

Words highlighted in **yellow** provide the cues for negative polarity.

### EXAMPLES of finding sentences or clauses with negative polarity:

The Veteran did **not** have a valid diagnosis of PTSD **or** have a psychiatric disorder that was causally or etiologically related to his military service.

[NOTE: This sentence contains two attribution relations separated by "or". Because of the grammatical form of the "or", the negative polarity of the initial "not" carries over to the second attribution relation.]

**Nor** is there evidence of a psychosis within one year of service.

**None** of the Veteran's alleged stressors based on in-service sexual assaults in the present case involve "fear of hostile military or terrorist activity," as contemplated by the amended regulation.

A psychiatric condition was **not** noted at the Veteran's entrance into service, and **clear and unmistakable evidence does not show** a psychiatric condition existed prior to service and was **not** aggravated therein.

[NOTE: This sentence contains two attribution relations. 1) "A psychiatric condition was **not** noted at the Veteran's entrance into service" is relevant to the Presumption of Soundness rule condition; although it has a negative grammatical polarity, logically such a finding tends to have a favorable effect on the Veteran's argument. 2) The words "**clear and unmistakable evidence does not show** a psychiatric condition existed prior to service and was **not** aggravated therein" links to the rule condition for rebutting the Presumption of Soundness; it has a negative grammatical polarity, but the finding has a complex logical effect within the Veteran's argument.]

Thus, **in the absence** of a diagnosis of PTSD, the Veteran's claim **fails**.

However, because, as will be discussed, the evidence shows that an anxiety disorder did **not** manifest in service, there is **no need to discuss** the presumption of soundness.

[NOTE: This sentence has two attribution relations: 1) a transform of a normal form: “*the evidence shows that an anxiety disorder did **not** manifest in service*”; 2) an aberrant form: “*there is **no need to discuss** the presumption of soundness.*” Both attribution relations have negative polarity, but the second has a complex interpretation within the logic of the argument.]