**Notes:**

* **AMT – quiz to start to see that they can get one of each kind correct.**
  + **Feedback if they get it wrong**
* **Evidence = assertion**
* **Local folks to test it!**
* **Near misses to add to examples – facts**
* **Update talk – handout to do quiz in the beginning and then explain my stuff (10 sentences) – each sentence gets 2 people**
* **Why does it matter? – significance!**
* **For each one show how it is different**
* **More conversational guidelines for AMT**
* **Add a verb in the label = need evidence!**
* **Go through examples again**

**Overview**

The goal of this work is to determine if certain lexical cues are 98% precise at identifying assertion and unexplored topic annotations as described below (98% of the time the sentences with these lexical cues in them are either evidence or new topic), in order to be able to estimate a lower bound on the number of these types of sentences in the scientific literature. For each lexical cue there are 31-40 sentences to annotate. If 2 sentences are neither assertion nor unexplored topic, then the lexical cue is not 98% precise.

1. **Task at hand**

**Scientific goals: Assertion and Unexplored Topic**

**Task:** Please annotate each sentence as assertion, unexplored topic, or neither as defined below. Think about how lay people would annotate these sentences (there are no tricks involved). Only use the information given in the sentence, do not bring in any outside knowledge. Please also include the trigger word(s) that led you to the conclusion that the sentence was assertion or unexplored topic, and the scientific goal that comes from that sentence specifically.

General caveat: Some lexical cues provided do not always connote the type of annotation.

1. **Definitions and Examples**

**Assertion annotation = needs more evidence**

* Sentences where the author asserts a suggestive conclusion from their experiments or results that is not definitive. The evidence suggests the conclusion but does not prove it. The authors leave room for others to argue with the conclusion. Given new evidence, if you could argue with the statement, then annotate it as assertion.
  + Possible cues: 'suggests', 'possible', 'may', 'potentially', 'not adequately', 'should', 'will', 'probably', 'hypothesis', 'could', 'implicate', 'perhaps', 'likely', 'might', 'perhaps', 'possibility', 'possible', 'possibly', 'potentially', 'probably', 'seem', 'speculate', 'whether', 'suspect', 'suppose', 'unsure', 'speculation', 'uncertainty'
* We assume a statement annotated as “assertion” needs **more** **evidence** in order to determine if the claim is true or not.
* **Goal for knowledge: acquire evidence**
* **Examples:** lexical cue highlighted, scientific goal underlined

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| --- | --- | --- |
| **Sentences** | **Scientific goal** | **Truth value** |
| “this hypothesis warrants further investigation; identification of mirna binding sites in the 3' utr of genes such as abcg2 that promote multidrug resistance could enable the delivery of specific mirnas from this cluster to tumours in an attempt to repress abcg2 and to increase sensitivity to existing therapeutic agents.” | The hypothesis needs more evidence | Some confidence in the hypothesis |
| “therefore, the obtained results are likely to be subject to further improvement if a perfect matching is performed.” | Perform perfect matching to get better results | Clear improvement to the strategy = almost true |
| “what if some of the assumptions in the theoretical modelling were mistaken, or if the virus did not behave according to those assumptions?” | rethink assumptions and model | Negative confidence |

* **For more examples:** See second tab in Annotation\_guidelines\_examples.xlsx (evidence annotation tab)

**Unexplored topic annotation**

* Sentences that introduce a lack of knowledge about a topic. There is little known information about the topic presented, except for the fact that it has not been studied. This includes a topic that warrants further investigation.
  + Possible cues: 'not understood', 'not been explored', 'not explored', 'not assessed', 'did not demonstrate', 'little is known', 'unexplored', 'unknown', 'not known', 'unclear', 'not designed to', 'did not allow for', 'controversial', 'has not been determined', 'have not been determined', 'incomplete', 'open question', 'not fully', 'not comprehensively', 'not specifically', 'debated', 'contentious', 'unclear', 'unknown', 'further investigation', 'not intended to', 'not planned to', 'not yield', 'not distinguish', 'not determined', 'not evaluated', 'not estimated', 'not measured', 'not investigated', 'has not been specified', 'has not been settled', 'has not been concluded', 'not been investigated', 'not been researched'
* We assume a statement annotated as “unexplored topic” could lead to another paper on the topic.
* **Goal for knowledge: topic in** **need of investigation**
* **Examples:** lexical cue highlighted, scientific goal underlined

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| --- | --- | --- |
| **Sentences** | **Scientific goal** | **Truth value** |
| “mirna expression has not previously been characterized in bccs, leaving a potentially important facet of the differences between the subtypes unexplored.” | The differences between the subtypes | None |
| “our comprehension data do not show whether or not the errors are due to difficulties in (morpho)syntax or the interface of (morpho)syntax with discourse or discourse and prosody because the task was not designed to distinguish between these three options.” | Distinguish between these 3 options | None |
| “however, our experiments did not comprehensively address the question of whether eyg functions in tribolium head development.” | Whether eyg functions in tribolium head development | None |

* **For more examples:** See first tab in Annotation\_guidelines\_examples.xlsx (new topic annotation tab)

**Neither annotation**

* Neither assertion nor unexplored topic annotations. Neither involves a definitive statement.
* **Examples:**

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| --- | --- | --- |
| **Sentences** | **Scientific goal** | **Truth value** |
| “in order to identify the possible source of the infection, we collected forest soil samples (n = 50) from the area where the infection most likely occurred and could indeed isolate a. mysorens from one sample.” |  | True |
| “neural network architectures provide a two-fold solution: a fast way of system customization to the patient and a better patient adoption to the system, improving the low rate of acceptance of the devices.” |  | True |
| “thus, the clinical picture, together with the serological findings did not clearly correlate with the early clinical manifestation of lyme disease, namely em [2,3].” |  | True |

* **For more examples:** See last tab in Annotation\_guidelines\_examples.xlsx (neither annotation tab)

1. **Confusing the annotations**

The main difference between assertion and unexplored topic annotations is

whether or not there is a truth value assigned to the sentence. Evidence annotations have a probabilistic truth value where the experiments provide some evidence for the conclusions but not enough to be definitive. One could almost say the truth value of an evidence annotation is almost true. For new topic annotations, there is no truth value involved because the author is stating future directions or unexplored topics in the area and not making any claim about its truth value.

**Similar tasks**

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| --- | --- | --- | --- |
| **Author** | **Task** | **Definition** | **In my terms** |
| Elizabeth White Thesis | Argumentation | Summarizing the paper = scientific methods, cognition, discourse, negation, causation, and modality | * Modality relates to **evidence annotation** * Negation is also rampant in the lexical cues used |
| Zerva/Ananiado (2017) | Uncertainty | Assessing the confidence of related information in terms of the certainty of a statement based on its textual context – hypotheses, speculated outcome, case under investigation, result attributed to an unclear external source (Medlock 2008)   * Uncertainty of events and particularly linking it with interactions in pathways and interaction networks | **Evidence annotation** but capturing how sure we are about it to use as evidence for mechanisms |
| Light (2004) - future work/applications:   * Speculation search engine * Knowledge discovery test set | Speculative language – distinguished between high and low but didn’t work | Expressions of levels of belief: the expressions of hypotheses, tentative conclusions, hedges, and speculations – (Affect) | **Evidence annotation** = levels of certainty – maybe how much more evidence we need |
| Vincze and Csirik (2008)   * Annotation guidelines includes keywords but cautions * Scientific texts harder than clinical stuff – not many articles annotated | Bioscope – uncertainty and negation corpus | Impressions, hypothesized explanations of experimental results or negative findings  Speculation = hedge/soft negation | **Evidence annotation** with hedging to speculate results so need more evidence because given a truth value here |
| Kilicoglu and Bergler (2008) | Speculative language = hedging | Nice review of previous work  Builds off of hyland | **Evidence annotation** with speculation |
| Hyland (1998) | Hedging | One part of epistemic modality, it indicates an unwillingness to make an explicit and complete commitment to the truth of propositions | **Evidence annotation** with hedging - no truth value commitment |
| Medlock (2007)   * Single terms as features, based on intuition that many hedge cues are single terms * Defined non-hedges as no cues for hedges = problematic   Future = | Hedging | Under the umbrella of subjectivity   * Authorial opinion   Hedge:   * an assertion relating to a result that does not necessarily follow from work presented but extrapolated from it (Light) * relay of hedge made in previous work * statement of knowledge paucity * speculative question * statement of speculative hypothesis * anaphoric hedge reference | **Evidence annotation** = hedging |
| Farkas - CoNLL (2010)   * application: information extraction, making sure everything is certain | Uncertainty cues and their linguistic scope | Hedges = indicating that authors do not or cannot back up their opinions/statements with facts | **Evidence annotations** = hedging |
| Ganter (2009) | Hedges by chasing weasels! – Wikipedia   * goal: to get rid of non-factual information | Offer an opinion without really backing it up and… are really used to express a non-neutral point of view | **Evidence annotations** = hedging |
| Ram and Hunter (1992) | Goals/desires for knowledge | A knowledge goal represents the need to fill in gaps in the reasoner’s knowledge base that are detected when a piece of information required for a task turns out to be missing, incorrect, or otherwise problematic   * gaps give rise to new questions, which in turn stimulate further interest in the topic * underlying goal: learn and improve one’s model of the world | Goals are:   * gather more evidence * investigate the topic in general |