

Date: March 2016

## Entity Annotation

### Overview

Annotate all entities that occur in the text and that belong to any of the following entity types:

- **Disorders**  
(FOCUS\_PSYCHIATRIC\_DISORDER, OTHER\_PSYCHIATRIC\_DISORDER, OTHER\_DISORDER)
- **Etiological Factors**  
(ETIOLOGICAL\_FACTOR)
- **Symptoms**  
(SYMPTOM)
- **Treatments** (TREATMENT)

Entities should also be annotated if they occur in their plural form or as adjective.

Example 1
<p>Main Concept: <b>depression</b></p> <p>Examples of correct annotations (among others):</p> <ul style="list-style-type: none"> <li>• depression</li> <li>• depressive</li> <li>• depressed</li> <li>• depressed patients (mark as patient group; additionally annotate “depressed” using nested annotation.)</li> <li>• Hamilton Depression Rating Scale (mark as disorder scale; additionally annotate “Depression” using nested annotation.)</li> <li>• Other possible annotations: depressive disorder, depressive illness, melancholia, symptoms of depression, depression symptomatology...</li> </ul>

### Disorders

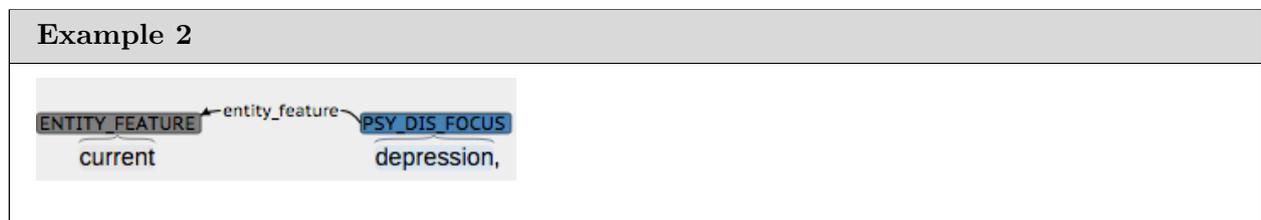
#### **FOCUS\_PSYCHIATRIC\_DISORDER - PSY\_DIS\_FOCUS**

Any of the following “core psychiatric disorders” should be annotated as FOCUS\_PSYCHIATRIC\_DISORDER:

- Depressive\_Disorder
- Dysthymic\_Disorder
- Generalized\_Anxiety\_Disorder
- Social\_Anxiety\_Disorder
- Obsessive\_Compulsive\_Disorder
- Panic\_Disorder
- Agoraphobia

### Disorder Sub-types

Disorder sub-types, such as “chronic depression”, “treatment-resistant depression”, “minor depression” or “mild to moderate depression” should be annotated using the ENTITY\_FEATURE complement, as described below in the Entity Complements Section and seen in Example 2.



On the other hand, the following disorders are not understood as subtypes, but as types on their own and should always be annotated as one disorder:

- Major depression; Major depressive disorder
- panic disorder with agoraphobia; panic disorder without agoraphobia
- Disorders starting with “clinical”: clinical panic, clinical anxiety, clinical depression, ...

### Disorder Modifiers

The following entity attributes can be added as modifiers to disorder annotations and it is crucial to add them wherever they apply:



**abbrev:** if a disorder is expressed through an abbreviation in the text, the abbreviation should be annotated as disorder and the “abbrev” entity attribute should be added.

**implicit:** if words in the text refer directly to a disorder but the disorder is not mentioned in these words, these words should be annotated with the disorder to which the reference is made but the “implicit” marker should be added.

The original concept should be connected to the implicit mention as an anaphora.

### Example 4

METHOD: An equibriometric movement pattern analysis system that allows differentiation between psychomotor activity and reactivity was

applied in 58 unipolar depressive patients and 76 healthy controls.

RESULTS: Compared to controls, the patients as a group were significantly slower in their psychomotor reactivity.

*In this example, “the patients” is annotated as Focus Psychiatric Disorder, adding the implicit and patient group attributes. It refers to the previously mentioned “unipolar depressive patients” to which the anaphoric relation is added.*

**patient group:** if a text mentions a group of patients/subjects with a specific disorder, they should be annotated as that disorder marked as “patient group” (see Example 5).

Important: Within the patient group the disorder itself also has to be annotated using nested annotation.

For the patient group, the longest possible span should be annotated (e.g. “chinese woman with depression” instead of “women with depression”).

If later in the text, only the text “the patients” occur, these should again be annotated with this specific disorder, adding the “Patient Group” marker, as well as the “implicit” marker, as shown in Example 4.

If there are several disorders annotated with entity\_part annotation, the patient group should only be annotated for the longest span (see Example 14), i.e. patient group annotations do not have to be added for each of the disorders.

### Example 5

individuals with generalized social anxiety disorder (SAD, n=85),

*In this example, the span “individuals with generalized social anxiety disorder” is annotated using the patient group modifier.*

**disorder scale:** if text is mentioning a disorder scale (e.g. for depressions), all mentions of this disorder scale should be annotated with the respective disorder, adding the modifier ‘disorder scale’. Annotation of disorder scales is important since mentions of disorder scales are used in some cases to refer to a disorder. If a disorder term occurs as part of a disorder scale annotation, it should be annotated separately, using nested annotation.

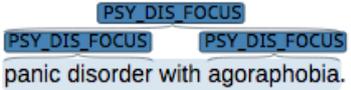
### Example 6

Hamilton Anxiety Rating Scale (HAM-A).

## Remarks and Special Cases for Disorder Annotation

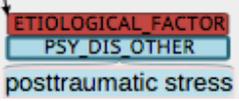
- Disorder sub-types should be annotated using ENTITY\_FEATURE annotation as shown above.
- Certain disorders should always be annotated as one disorder instead of making use of entity feature annotation (e.g. “Major Depression”, “panic disorder with agoraphobia”, “clinical panic”, “clinical anxiety”, ...). However, the parts of it should be annotated as well using nested annotation (see Examples 7 and 13).
- Disorders should be annotated in any case, even if they occur as part of another entity.
- Constructions like the following should be annotated as disorder, with the disorder itself annotated as well using nested annotation: “symptoms of depression”, “depressive symptomatology”. Compare Example 15.
- “panic” should not be annotated if it occurs on its own, but only if it occurs as “clinical panic” or “panic disorder”.

If more than one disorder occur as part of another disorder, nested annotation should be applied (Example 7).

Example 7
 <p>The diagram shows the text "panic disorder with agoraphobia." with three overlapping blue boxes labeled "PSY_DIS_FOCUS". One box covers the entire phrase. Two other boxes are nested within it: one covers "panic disorder" and the other covers "with agoraphobia".</p>

## OTHER\_PSYCHIATRIC\_DISORDER - PSY\_DIS\_OTHER

Any other psychiatric disorder that is not in the list of Focus Psychiatric Disorders. If this disorder at the same time functions as etiological factor, it should be annotated as etiological factor as well by using double/nested annotations.

Example 8
 <p>The diagram shows the text "posttraumatic stress" with two overlapping boxes. The outer box is red and labeled "ETIOLOGICAL_FACTOR", covering the entire phrase. The inner box is blue and labeled "PSY_DIS_OTHER", covering "posttraumatic stress".</p>

## OTHER\_DISORDER

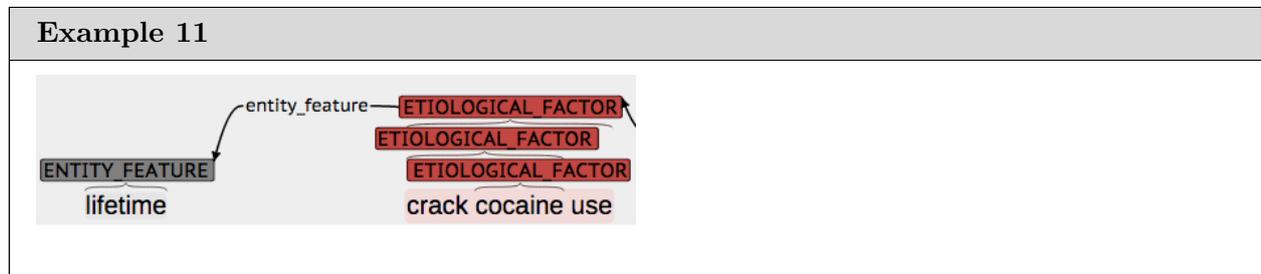
Any other non-psychiatric disorder. Same as for OTHER\_PSYCHIATRIC\_DISORDER, if this disorder at the same time functions as etiological factor, it should be annotated as etiological factor as well by using double/nested annotations.



(If there is doubt that a piece of information is crucial enough to be annotated as part of an entity, better use “ENTITY\_FEATURE” instead.)

## ENTITY\_FEATURE

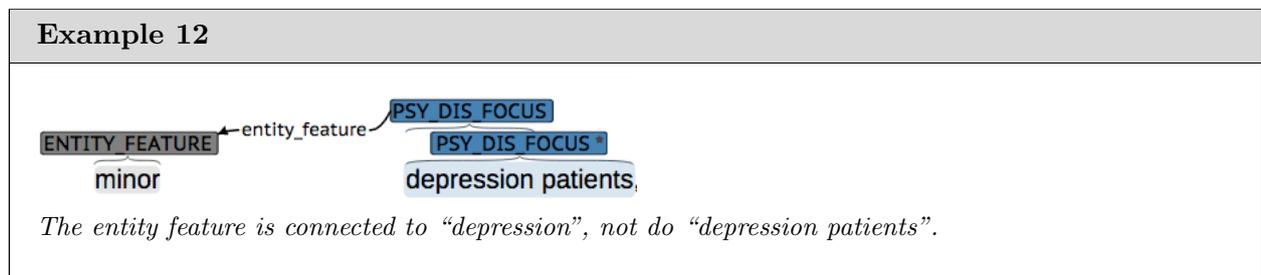
Entity features add additional properties to entities.



Can be connected to the following entity annotations:

- FOCUS\_PSYCHIATRIC\_DISORDER (Disorder\_Feature Relation)
- OTHER\_PSYCHIATRIC\_DISORDER (Disorder\_Feature Relation)
- AETIOLOGICAL\_FACTOR (Etiology\_Feature Relation)
- TREATMENT (Treatment\_Feature Relation)
- ENTITY\_FEATURE (Feature\_Feature Relation)

It is important that an entity feature is connected to the correct referent, as can be seen in Example 12.

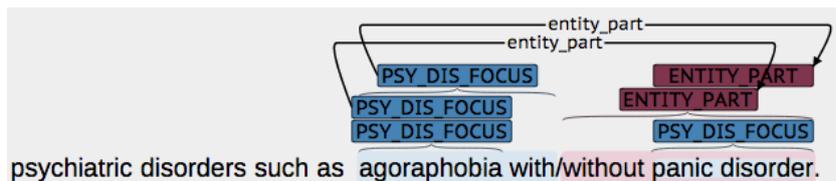


## ENTITY\_PART

Entity parts are not complements strictly speaking, since they are used whenever an entity cannot be annotated in one piece for some reason. Together with the span of text annotated as entity they form the complete term, i.e. after the annotation, these two parts are joined together to form one term as it could be entered in a dictionary.

Entity parts can be used interchangeably with fragment annotation. Fragment annotation is done in BRAT in the following way: Annotate an entity, click on the annotation and select ”Add Fragment” then chose a fragment of the text as belonging to the entity. **The two parts of entity, the span annotated with the entity part as well as the span annotated with the ENTITY\_PART tag, are to be seen as equally important and belonging together. For this reason, it does not matter if the entity part or the entity itself are annotated first (both Examples 13 and 14 are correct).**

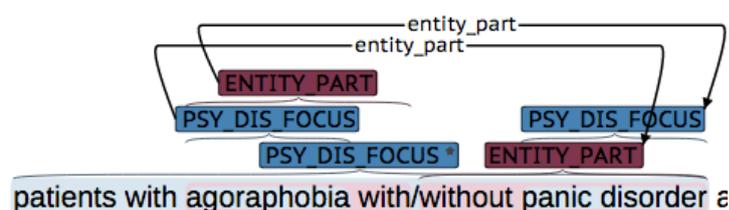
### Example 13



In this example, the disorders “agoraphobia with panic disorder” and “agoraphobia without panic disorder” are annotated using entity parts. The parts, which cannot be annotated in one span, can be added together after annotation to obtain the two entities. Furthermore, the disorders “agoraphobia” and “panic disorder” are annotated separately as disorders on their own. The following entities can be extracted from the annotations:

- agoraphobia with panic disorder
- agoraphobia without panic disorder
- agoraphobia
- panic disorder

### Example 14



This shows a similar setting as Example 13, but including a patient group annotation (“patients with agoraphobia with/without panic disorder”). Note that the entity part and entity are reversed here compared to Example 13. This is no problem, as entity part annotation and entity annotation are joined together to obtain the final entity annotation.

ENTITY\_PART can occur together with the following entity annotations:

- FOCUS\_PSYCHIATRIC\_DISORDER
- OTHER\_PSYCHIATRIC\_DISORDER
- AETIOLOGICAL\_FACTOR

## Other Entities

### TREATMENT

Any Entity that the text mentions to be a treatment for any of the following entities:

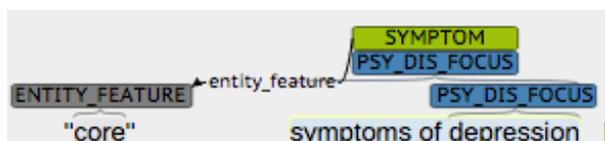
- FOCUS\_PSYCHIATRIC\_DISORDER
- OTHER\_PSYCHIATRIC\_DISORDER

## SYMPTOM

Any Entity that the text mentions to be a symptom of any of the following entities:

- FOCUS\_PSYCHIATRIC\_DISORDER
- OTHER\_PSYCHIATRIC\_DISORDER

### Example 15



*In this example, the symptom annotation contains a nested focus disorder annotation.*

*The span “symptoms of depression” should be annotated as SYMPTOM and PSY\_DIS\_FOCUS using double annotation.*

## OTHER\_ENTITY

This should be used if there is any other entity mentioned that is none of the above but still is meaningful in some way (only use this if it cannot be annotated in any other way) [REMARK: Was this ever used? Can this be deleted?]

## UNCLEAR

Placeholder for any annotation that is relevant but it is unclear to the annotator how exactly it should be annotated.

## Relation Annotation

### Equivalence = Equiv

Should be used if two terms are annotated in the same abstract that are equivalent to each other (e.g. long form and abbreviation of the same term).

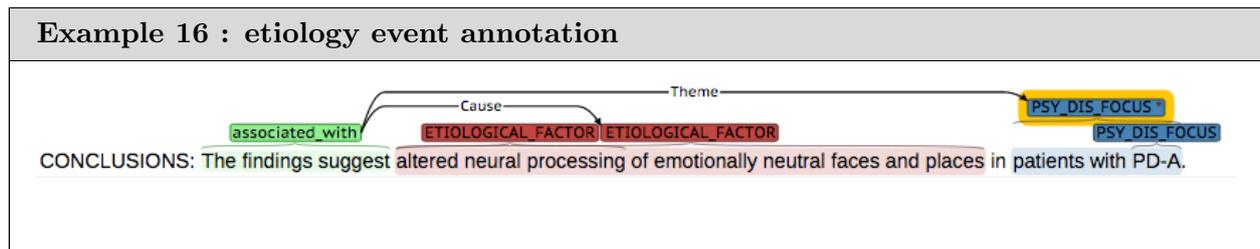
Throughout the text, all equivalences should be annotated for all annotated entities. One equivalence annotation per term variant pair is sufficient (e.g. if an equivalence between a full form and an abbreviation is annotated at the beginning of an abstract, this does not have to be repeated for every occurrence of the abbreviated form). See Example 5.

It is important that only terms with completely identical meaning are annotated as equivalent.

### Anaphora

An anaphora should be used if a focus entity occurs in one sentence but a statement about a focus entity is made in a different sentence using pronouns or a more general form which does not express the focus entity (e.g. “the patients” instead of “patients with depression”). See Example 4 above. The anaphora relation should always (only) be connected to the closest preceding explicit focus entity.

# Event Annotations



An Event annotation consists of the following elements:

- Entities involved in the event (here: Etiological Factor (red) and Focus Psychiatric Disorder (blue))
- Textual evidence for the event (marked in green)
- The involved entities are connected to the textual evidence as *Cause* (Etiological Factors) or as *Theme* (Disorders).

**Each event evidence needs to be connected to at least two actors/entities: one disorder and one etiological factor!**

The following events should be annotated when they occur:

- **associated\_with**  
*Cause\**: Etiological Factor, *Theme\**: Psychiatric Disorder (*focus + non-focus*)  
Used for etiological events. As arguments, it takes a psychiatric disorder (focus disorder or non-focus disorder) and an etiological factor.
- **treatment\_for**  
*Cause*: Treatment, *Theme\**: Psychiatric Disorder (*focus + non-focus*)  
Used for treatment events. As arguments, it takes a psychiatric disorder (focus disorder or non-focus disorder) and a treatment.
- **other\_relation**  
*Cause\**: Symptom/OTHER\_ENTITY, *Theme\**: Psychiatric Disorder (*focus + non-focus*)  
Used for symptom events. As arguments, it takes a psychiatric disorder (focus disorder or non-focus disorder) and a symptom.

**Note:** if any of the entities involved in an event are annotated using nested annotation, the event should be connected to the span that makes most sense, or, if in doubt, to the longest annotated span, as can be seen in the example: the event is connected to “patients with PD-A” instead of “PD-A” only. Using nested annotation, it does not make sense to connect the event to all nested parts.

## Event Attributes

The following attributes and modifiers can be added to Events and should be added in all cases where they apply:

- **positive\_association**  
*An event describes a positive association (e.g. between a disorder and a etiological factor)*

- **negative\_association**

*An event describes a negative association (e.g. between a disorder and a etiological factor)*

- **Negation**

*An event is described as not holding true.*

- **Speculation**

*The authors of a paper/abstract speculate about an event being true but it is not stated as fact.*

- **Revised**

*In the past an event was believed to hold true but this knowledge has been revised according to the current text.*

**Example 17 : Event annotation window in BRAT**

**Event type**

- treatment\_for
- associated\_with
- other\_relation

**Event attributes**

- negative\_association
- positive\_association
- Negation
- Speculation
- Revised

## How to annotate

### General Rules

- Consistency of annotations is important. Everything should be annotated the same way. If consistency cannot be kept for some reason, the span of text should be marked and discussed.
- All entities should be annotated, regardless if they participate in an event or not.
- (For all entities, terms in the text should be annotated as they possibly would occur in a dictionary.)
- Important: make sure to add entity modifiers (implicit, disorder scale, patient group) whenever they apply.
- Only annotate the span of text itself without any punctuation or brackets which do not belong to the entity itself (e.g. if an entity occurs at the end of a sentence be careful exclude the full stop marking the end of the sentence).

- It can happen that annotations overlap. This should not be a problem.
- Entities should be annotated in a nested way wherever it applies. However, with etiological factors this is less strict: when there is a doubt, the longest span that makes sense should be annotated.
- For other disorders and other psychiatric disorders, it is not as crucial that all sub-disorders are annotated using nested annotation.

## Annotation Workflow

1. Annotate Entity mentions, add all necessary attributes (such as patient group, disorder scale and/or implicit).
2. Annotate evidence text for any of the events to be annotated (*associated\_with*, *treatment\_for*, *other\_relation*), choose the appropriate event type (Example 17).
3. Connect the arguments participating in the event. There can be more than one arguments of one type (e.g. several etiological factors can be connected to the same focus disorder).