Caption Label Noise Dataset (CLaN) Documentation - Data Appendix

First we provide an overview of the file contents included in this appendix. Then we provide details about the data collection and annotation protocol. Then, we provide information on how to setup our annotation interface. Lastly, we show tables and figures showing agreement stratified by question, option, and dataset.

Documents

1. `veil_annotation_project.zip` : a compressed directory containing images from each in-the-wild dataset.
2. `annotator_1_labelstudio_export.json` : contains metadata used to populate Label Studio annotation interface and selected annotations from annotator 1.
3. `annotator_1_labelstudio_export.json` : contains metadata used to populate Label Studio annotation interface and selected annotations from annotator 2.
4. `clan-label-interface.xml` : contains labeling interface code which can be pasted into label-studio. Note that the alias (stored in annotations.csv) mapping is in this file.
5. `annotations.csv` : contains all annotations

Data Collection and Annotation Protocol

We use three in-the-wild datasets (SBUCaps, RedCaps, Conceptual Captions) to construct this dataset. We perform weighted sampling to draw VAELs from the same distribution as WSOD training; this also represents VAELs from a diverse range of categories rather than a few frequent categroies. We sample 100 VAELs, their caption, and corresponding image from each in-the-wild VL dataset.

Annotation Schema

We annotate four types of information for each sample:

1. (Q1: Label Noise) How much of the VAEL object is present (visible, partially visible, completely absent);
2. (Q2: Similar Context) If the VAEL object is completely missing, whether a traditionally co-occurring context (“boat” and “water”), or semantically similar object (e.g. “cake” and “bread”, “car” and “truck”) is present;
3. (Q3: Visual Defects) If visible/partially visible, whether the VAEL object is occluded, has key parts missing, or atypical appearance (e.g. knitted animal); and
4. (Q4: Linguistic Indicators) What linguistic cues, if any, explain why the VAEL object is mentioned but absent, e.g. the caption discusses events or information beyond what the image shows (“beyond” in Table 1), describes the past (“past”), the extracted label is part of a prepositional phrase and likely to describe the setting and not objects (“on a train”), is a noun modifying another noun, is used in a non-literal way, has a different word sense (e.g. “bed” vs “river bed”), or is part of a named entity.

We compared disagreements between the two annotators after they annotated 100 samples from RedCaps and used it to calibrate responses for the remaining samples from SBUCaps and Conceptual Captions. We

indeed observe higher agreement (weighted Cohen's Kappa) for Q2-Q4 the remaining datasets in the Agreement section.

Annotation Interface Setup

1. Download Label-Studio (requires Python version 3.8+)

```
python3 -m venv env
source env/bin/activate
python -m pip install label-studio
```

2. Unzip compressed image data

```
unzip veil_annotation_project.zip -d veil_annotation_project
```

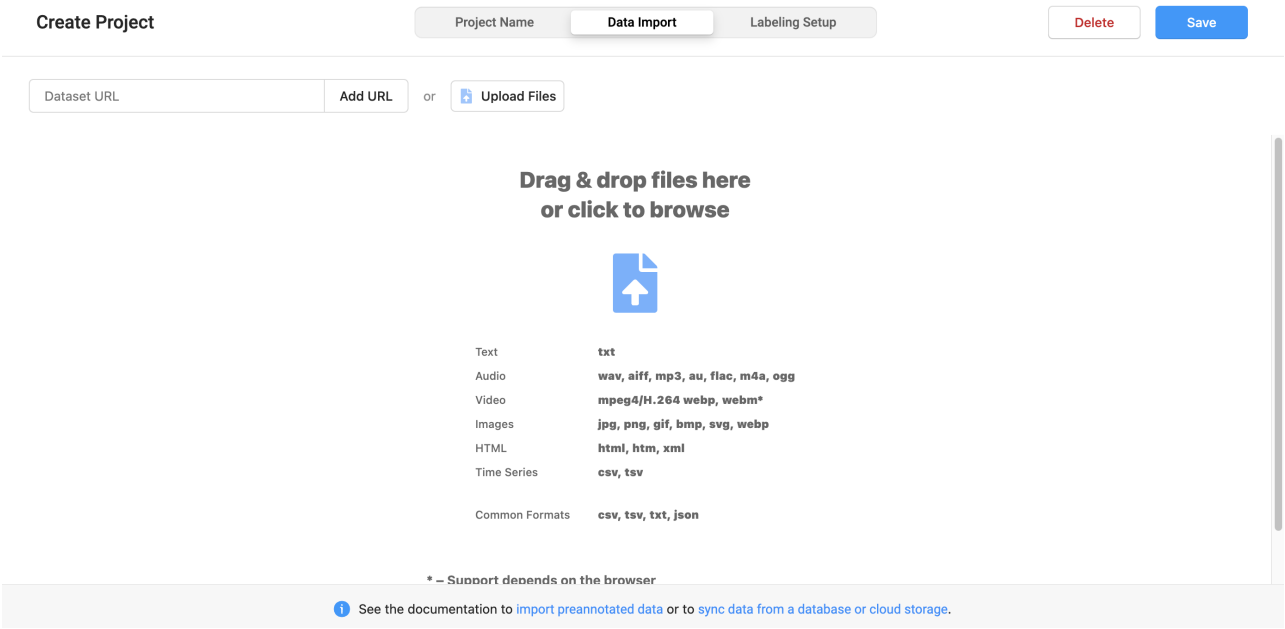
3. Setup environment variables

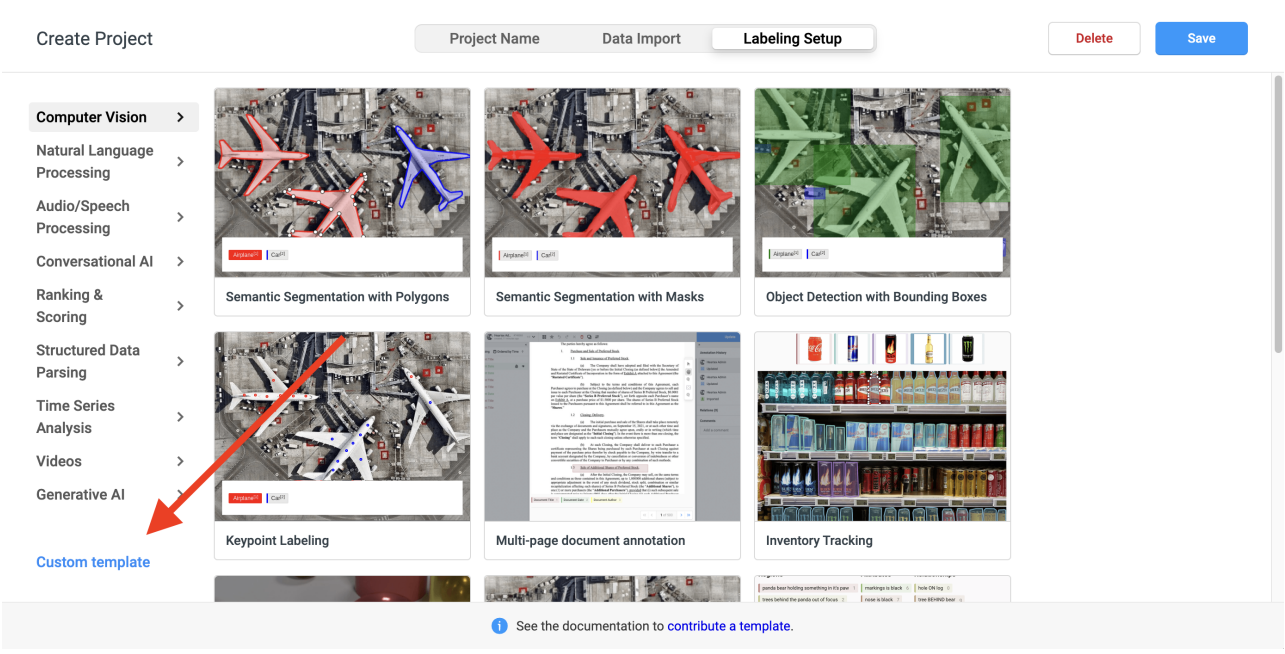
```
LABEL_STUDIO_LOCAL_FILES_SERVING_ENABLED=TRUE
LABEL_STUDIO_LOCAL_FILES_DOCUMENT_ROOT=/ # replace with absolute path to
the parent directory of veil_annotation_project
```

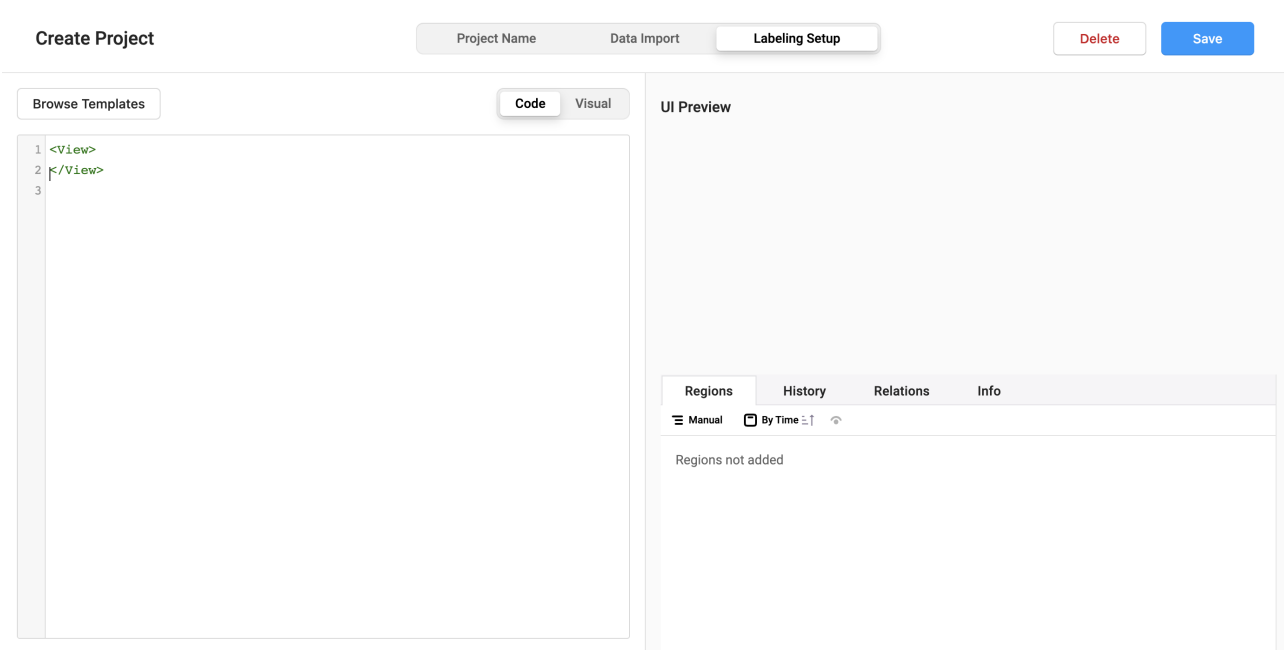
4. Launch Label Studio `label-studio`

5. Create a new project.

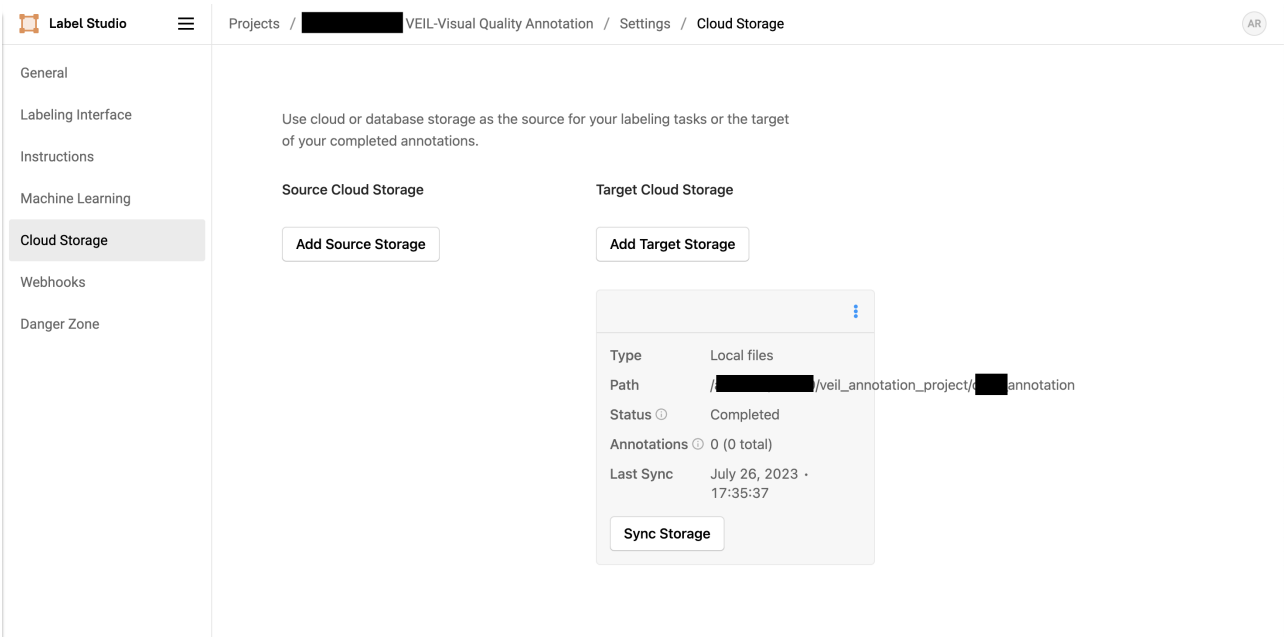
6. Import one of the JSON files above `annotator_1_labelstudio_export.json` OR `annotator_2_labelstudio_export.json`. To populate the labeling interface, copy the contents of `clan-label-interface.xml`.


Create Project
Project Name
Data Import
Labeling Setup
Delete
Save
Dataset URL
Add URL
or
Upload Files
Drag & drop files here
or click to browse
Text txt
Audio wav, aiff, mp3, au, flac, m4a, ogg
Video mpeg4/H.264 webp, webm*
Images jpg, png, gif, bmp, svg, webp
HTML html, htm, xml
Time Series csv, tsv
Common Formats csv, tsv, txt, json
* – Support depends on the browser
See the documentation to import preannotated data or to sync data from a database or cloud storage.


Create Project
Project Name
Data Import
Labeling Setup
Delete
Save
Computer Vision
Natural Language Processing
Audio/Speech Processing
Conversational AI
Ranking & Scoring
Structured Data Parsing
Time Series Analysis
Videos
Generative AI
Custom template
Semantic Segmentation with Polygons
Semantic Segmentation with Masks
Object Detection with Bounding Boxes
Keypoint Labeling
Multi-page document annotation
Inventory Tracking
See the documentation to contribute a template.


Create Project
Project Name
Data Import
Labeling Setup
Delete
Save
Browse Templates
Code
Visual
1 <View>
2 </View>
3
UI Preview
Regions
History
Relations
Info
Manual
By Time
Regions not added

7. Finally, set the target storage. This is where you want to store your annotations. Note that if you set the environment variables correctly, then all the images should load correctly. (redacted example below)



Should the images not load, then there might be an error with the relative paths in the export file. Check if you can construct the absolute file path by concatenating the output of `echo LABEL_STUDIO_LOCAL_FILES_DOCUMENT_ROOT` and `image_url` in the export json files (after ?d=).

Annotation Interface Example

Projects / [redacted] VEIL-Visual Quality Annotation / Labeling

#1041 [redacted]

For the following VAEL 'train', answer the following questions:

Q1: Object Visibility (select which one is applicable)

VAEL: train
CAPTION: riley just came home after finishing his 2 week board and train!

- [ ] Option 1: Visible - 75% or more of object is visible[1]
- [ ] Option 2: Partially Visible - less than 75% of object is visible[2]
- [x] Option 3: Completely Missing[3]
- [ ] Option 4: Not clear what fraction of the object is visible[4]

Q2: If Option 3 [Object completely missing] was selected in Q1 (check all that apply)

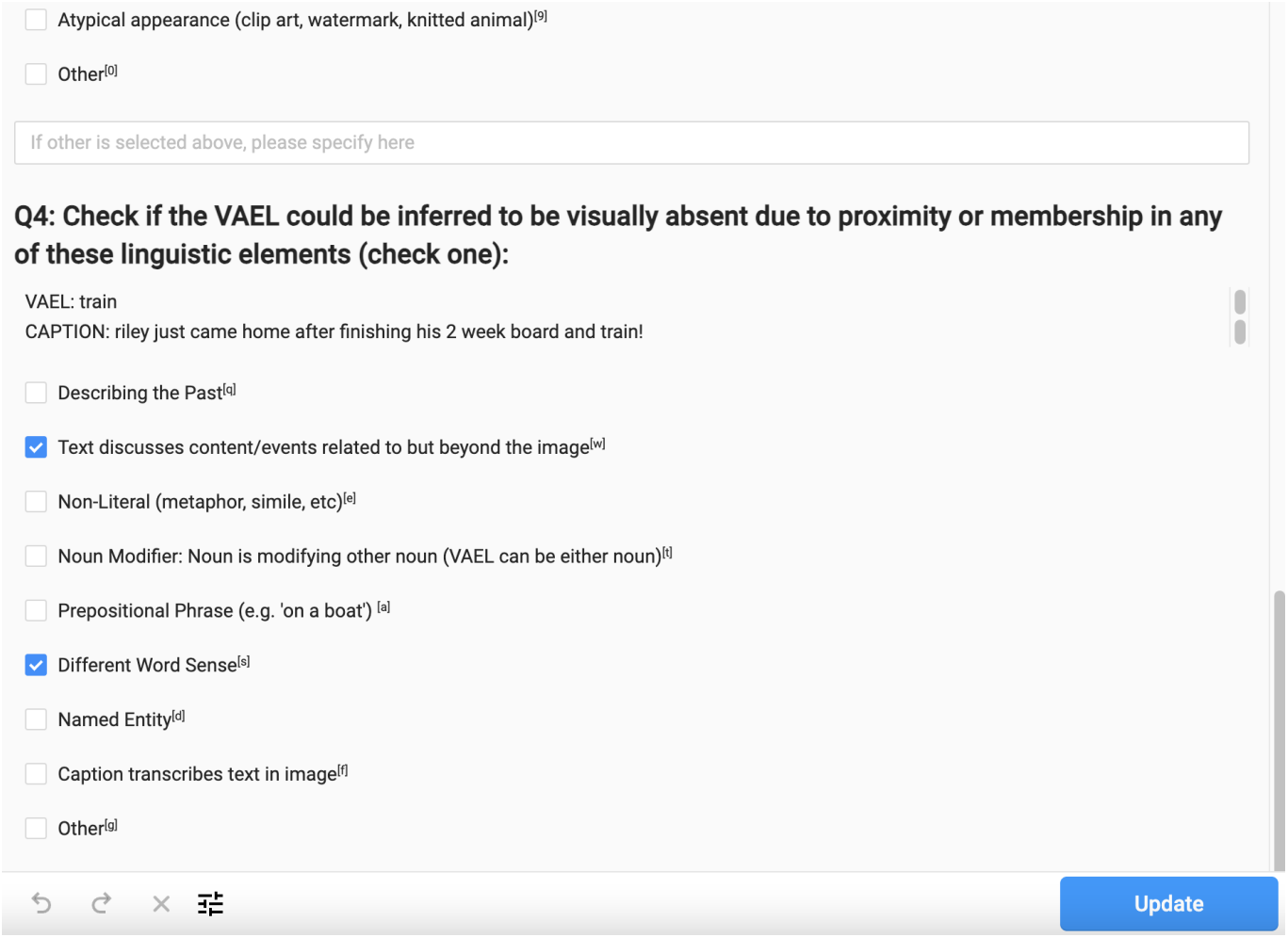
VAEL: train
CAPTION: riley just came home after finishing his 2 week board and train!

- [ ] Image contains co-occurring scene/objects/entities with extracted label (boat and water, train and train tracks, bus and bus stop) [5]
- [ ] Semantically similar object is present in image instead (e.g. extracted label is truck but there is a car present in the image)[6]

Q3: Object Appearance Quality - Defects (check all that apply)

VAEL: train
CAPTION: riley just came home after finishing his 2 week board and train!

- [ ] Occlusion (for example: inside a vehicle, or object blocked by another entity in an image)[7]
- [ ] Key Parts are missing from image (like head of an animal)[8]



Agreement

	Q1	Q2	Q3	Q4
RedCaps	0.75	0.14	0.29	0.56
SBUCaps	0.69	0.38	0.49	0.57
CC	0.83	0.33	0.52	0.61

Table: Annotator Agreement with Weighted Cohen's Kappa

Agreement by Option Figures per Dataset

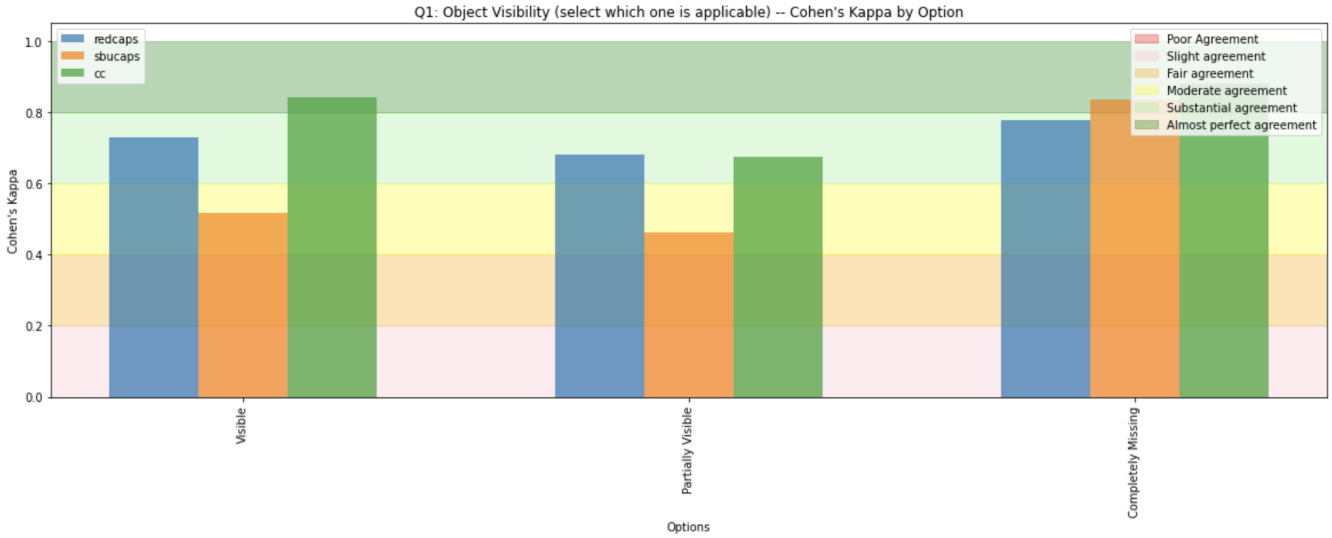


Figure: Annotator Agreement for Question 1

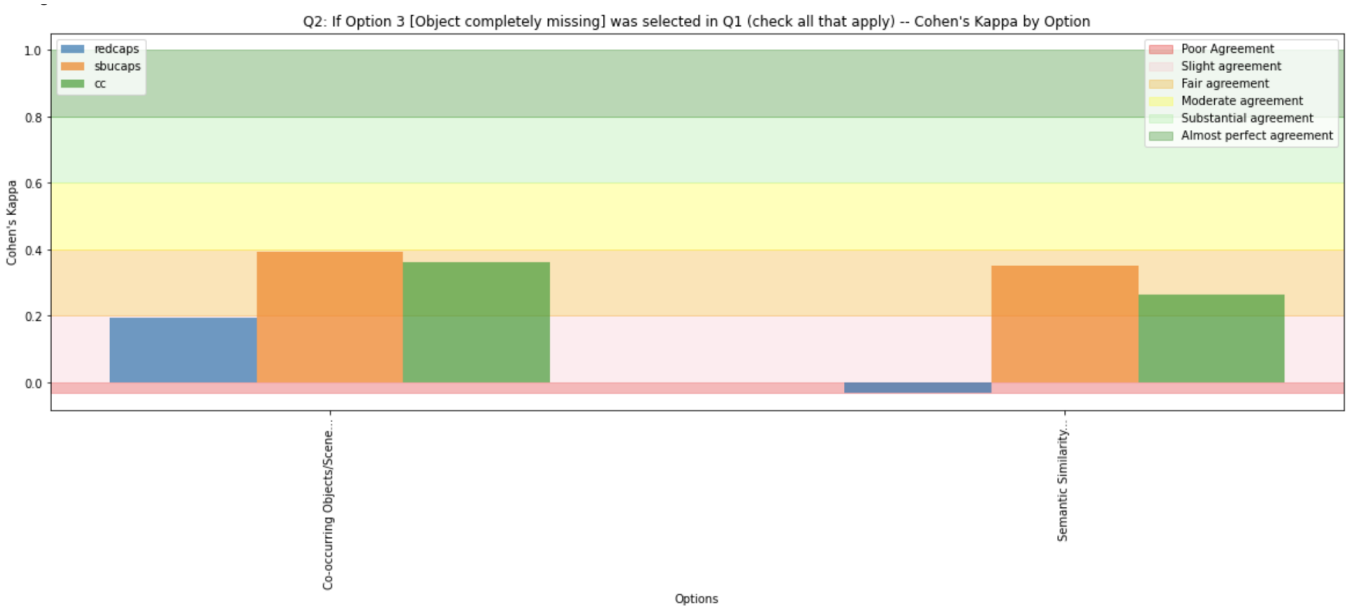


Figure: Annotator Agreement for Question 2

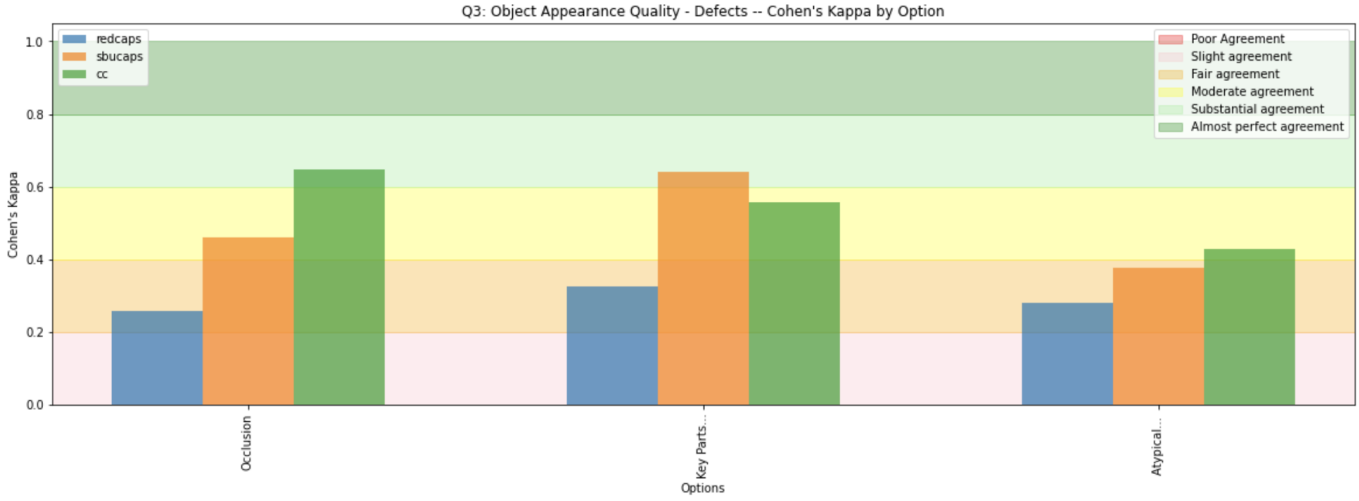


Figure: Annotator Agreement for Question 3

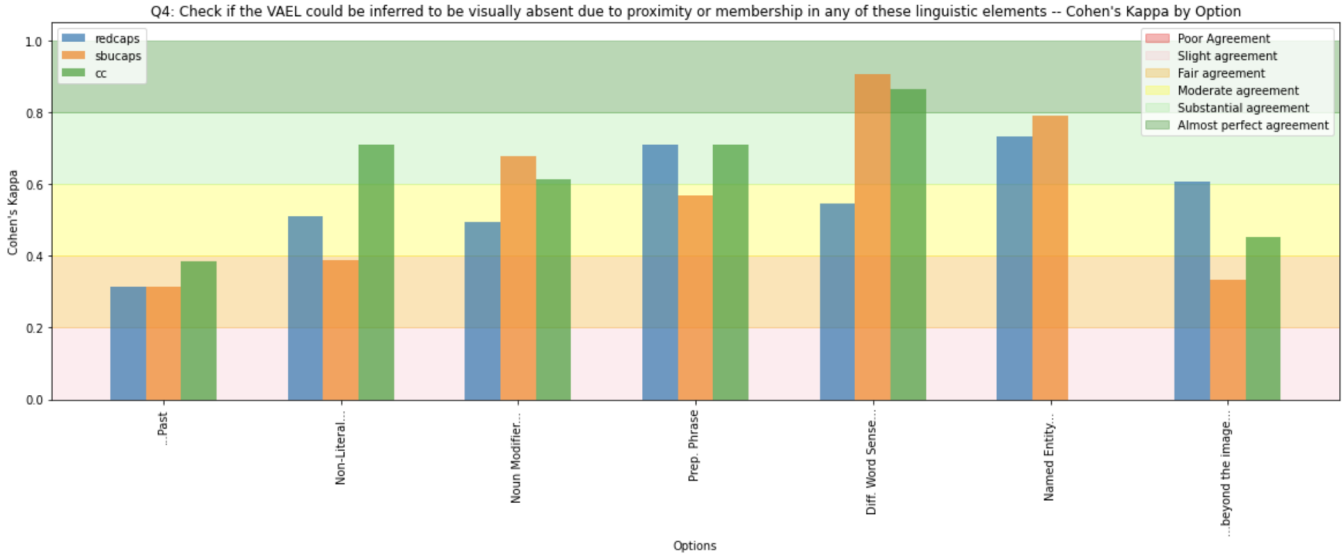


Figure: Annotator Agreement for Question 4