

FORECAST2023: A Forecast and Reasoning Corpus of Argumentation Structures

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University
of Dundee

ARG-tech
Centre for Argument Technology

Main Contribution

Dataset of 205 unique forecasting rationales annotated in IAT for argumentation structures

Forecasting Competitions

- test individuals on their accuracy in predicting future geopolitical events
- topics cover areas such as health, finance, climate, politics, international relations and technology
- used to inform researchers across many domains including intelligence work, psychology, economics and political science exploring

The Process

**Raw data
from HFC**

The Process

**Raw data
from HFC**

**Pre-
processing
and
automated
annotation**



The Process

**Raw data
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**Manual
Annotation**



The Process

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**Manual
Annotation**

**IAT-annotated
dataset of
forecasting
rationales**



**Raw data
from HFC**

Raw data from HFC

Will France's President Emmanuel Macron experience a significant leadership disruption between 3 April 2019 and 29 November 2019?

Yes

0.05

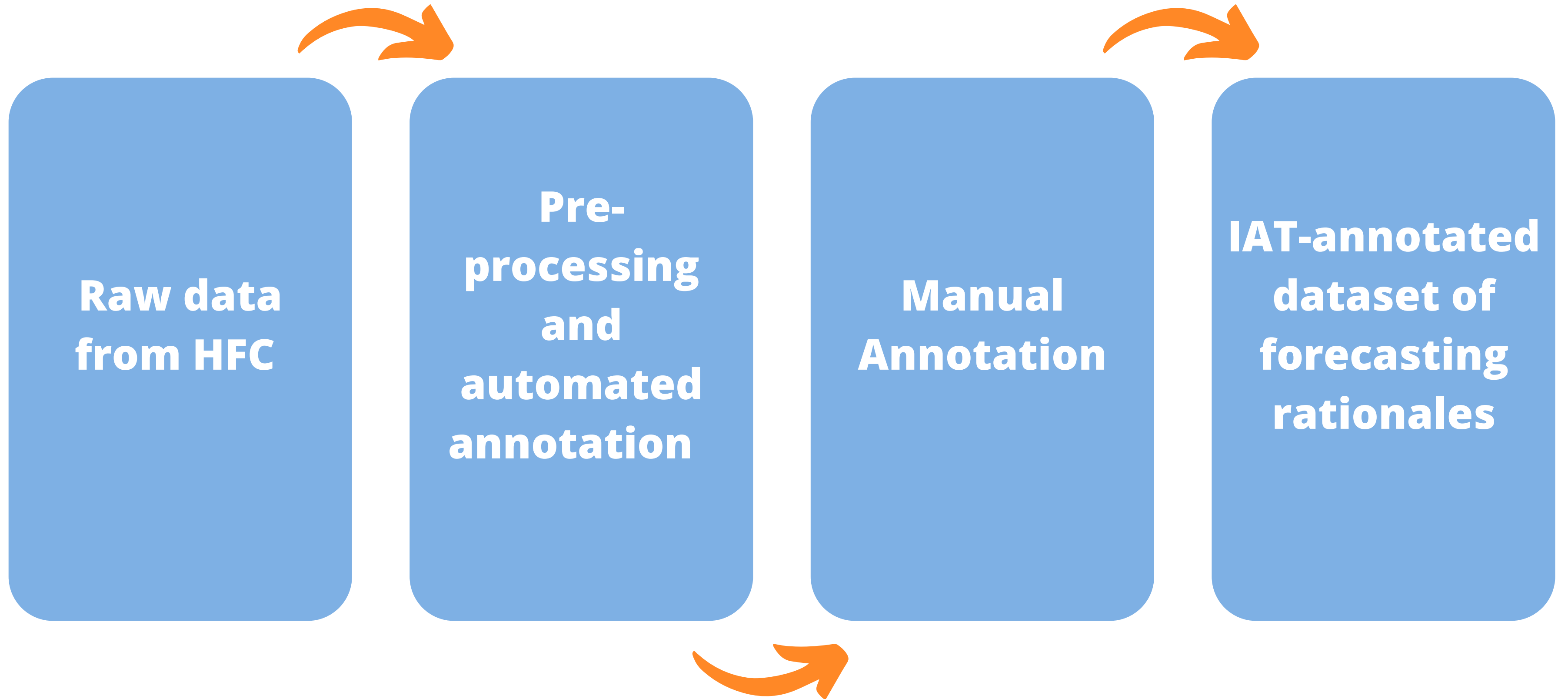
No

0.95

Rationale

I believe with the yellow vest protests put on by the working class who have been hit with low wages and heightened gasoline taxes are a sign of the people's abilities, but I do not believe this is something that will take Macron out of office. Macron has attempted to meet voters demands and is trying to rectify the situation by being more involved and less out of touch. Macron is hosting or involved in political discussions, debates and meetings to address the unrest in his country. I do think he's made plenty of mistakes that caused a lot of damage (albeit some being done by the protestors), but I believe he is regaining 'popularity' enough to maintain office.

The Process



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Data Filtering

**Pre-
processing
and
automated
annotation**

- Remove any answers made after the outcome was known
- Remove rationale under 10 words
- Remove forecasts where outcomes were almost certain
- Append updates to preceding forecast to be annotated together

Sampling

**Pre-
processing
and
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annotation**

We choose 120 rationales at random while ensuring they are not weighted towards any:

- question
- participant

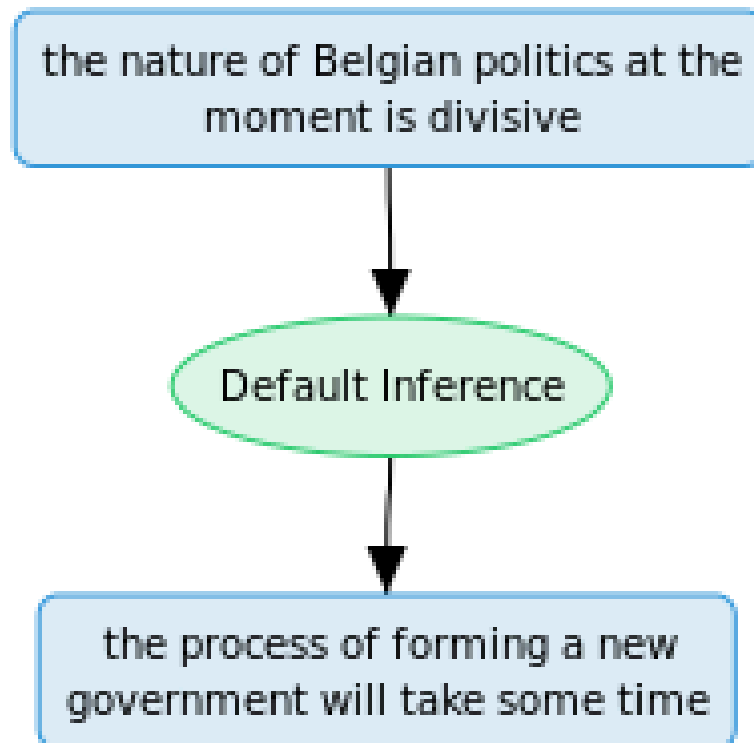
With updates making 205 rationales to be annotated

Automated Annotation

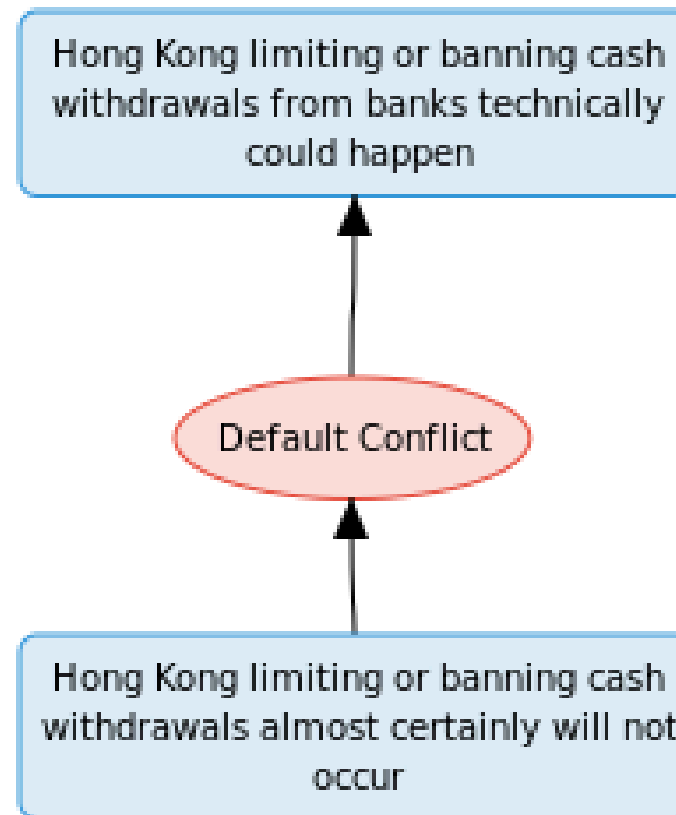
**Pre-
processing
and
automated
annotation**

We annotate in Inference Anchoring Theory,
which captures:

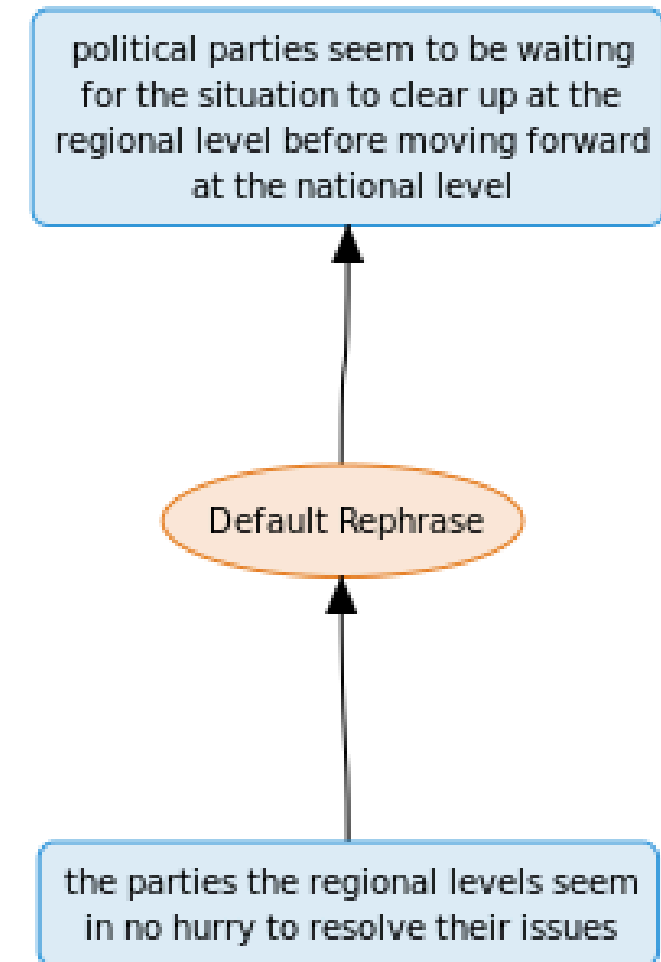
- argument structure



Relation of Support



Relation of Conflict



Relation of Rephrase

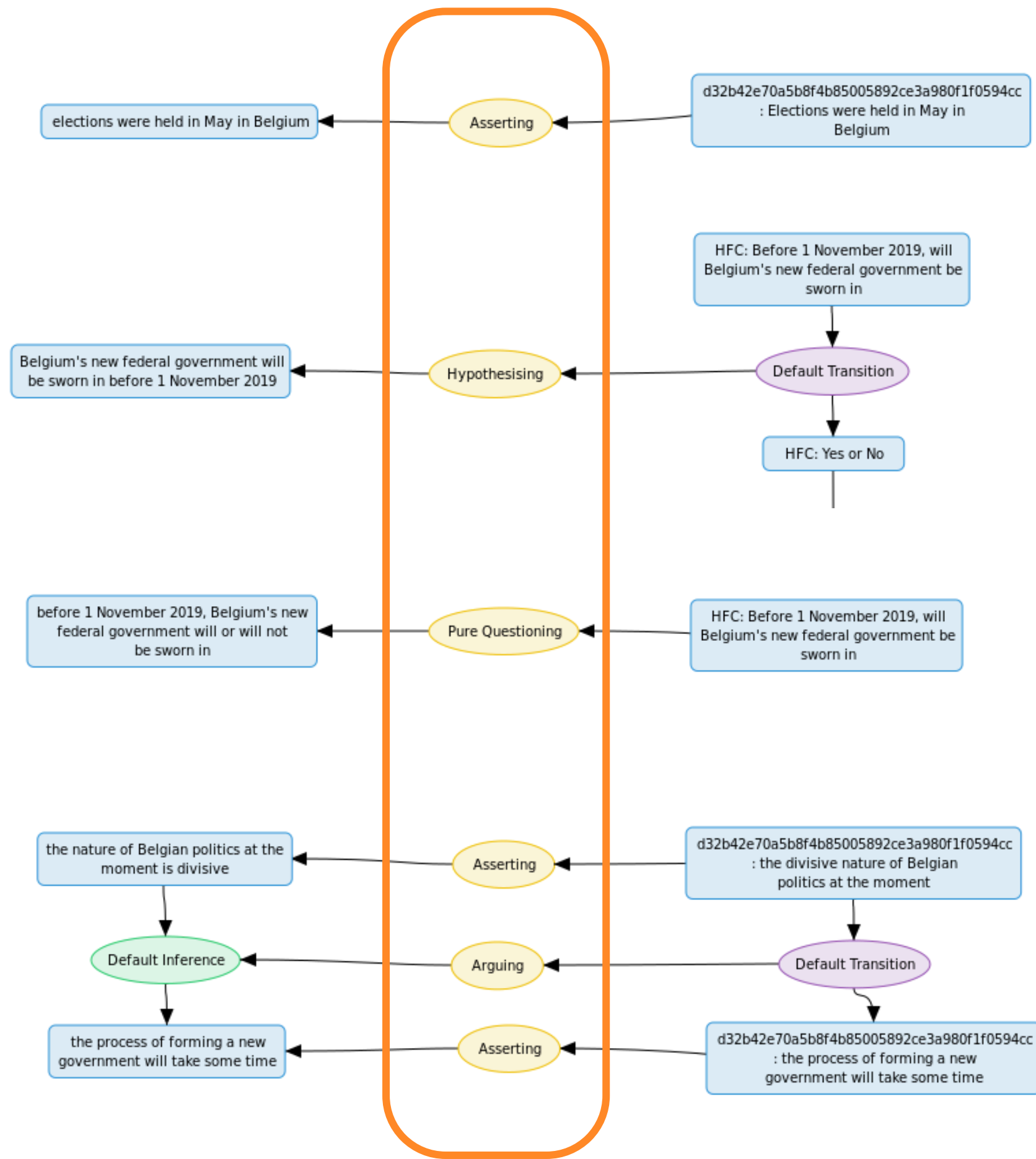
Automated Annotation

**Pre-
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automated
annotation**

We annotate in Inference Anchoring Theory,
which captures:

- argument structure
- speech acts

Asserting
Arguing
Agreeing
Alternative Giving
Challenging
Disagreeing
Evaluating
Hypothesising
Restating
Pure Questioning
Default Illocuting

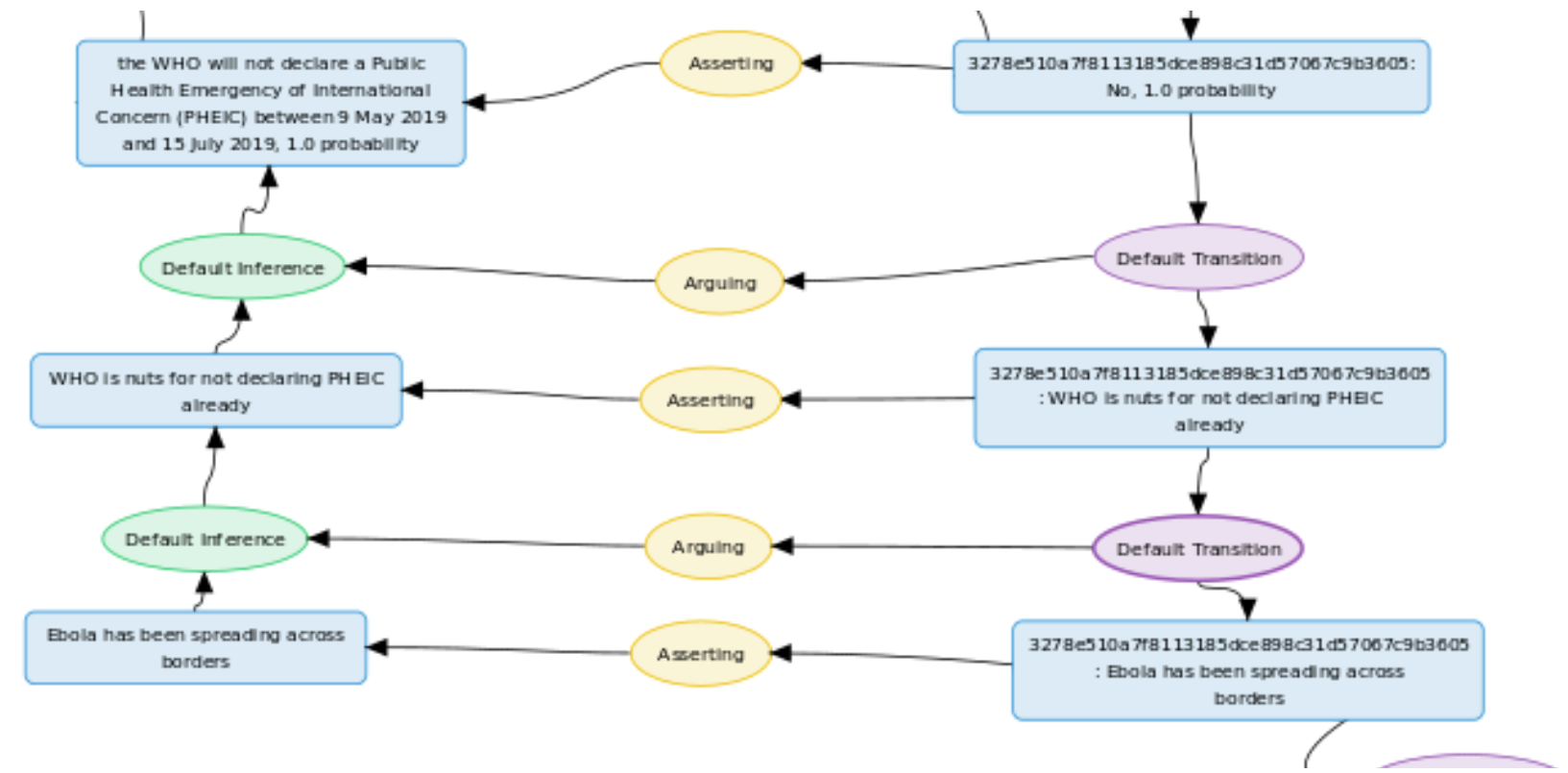
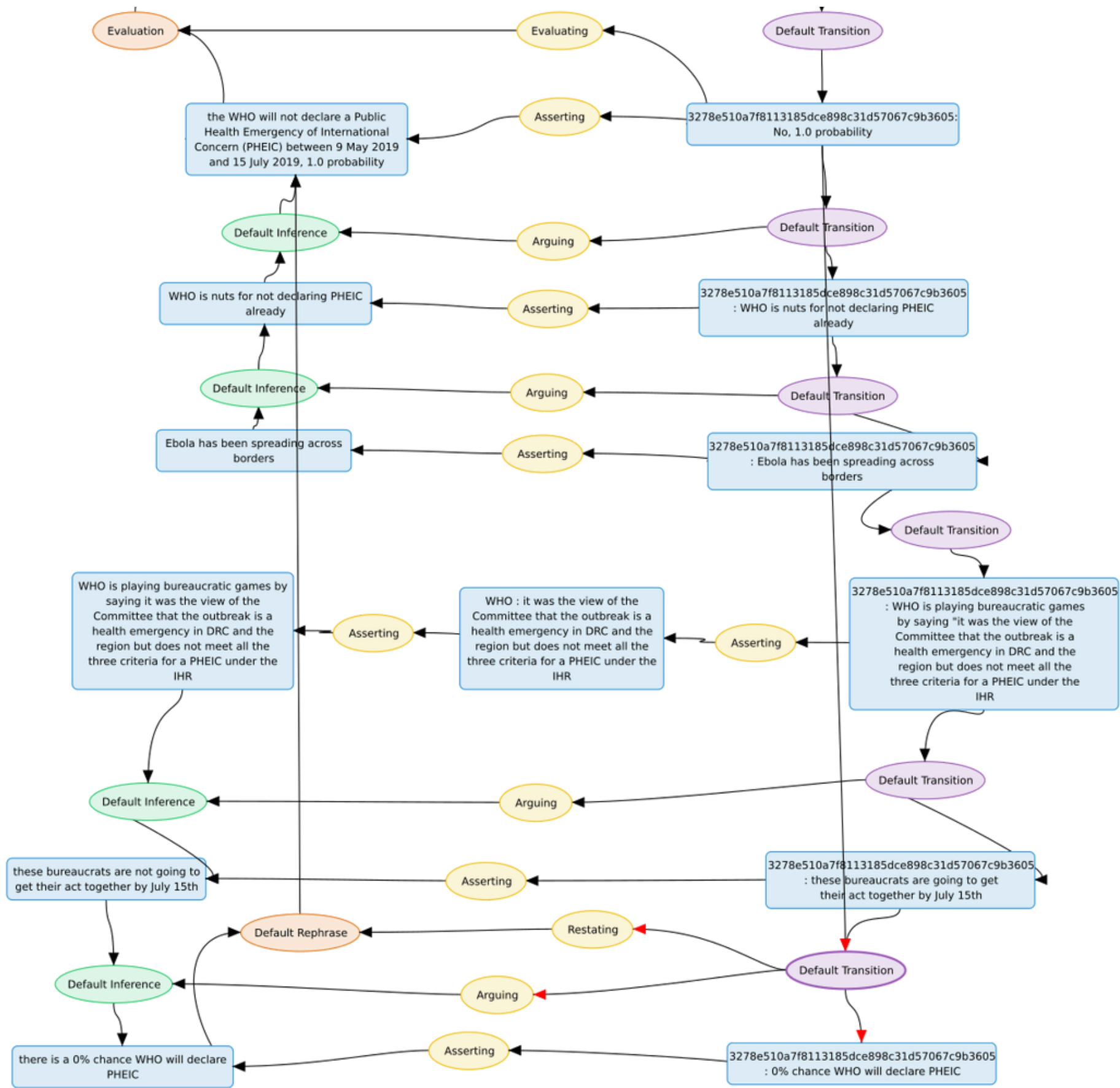


Automated Annotation

**Pre-
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and
automated
annotation**

We annotate in Inference Anchoring Theory,
which captures:

- argument structure
- speech acts
- dialogue rules



Transitions model the dialogue

Both short distance transitions showing turn-taking and longer distance reflecting the argumentation structure

Automated Annotation

The question and answer portion of the text is structured, lending towards automated analysis.

First step to reduce total annotation time.

Will France's President Emmanuel Macron experience a significant leadership disruption between 3 April 2019 and 29 November 2019?

Yes

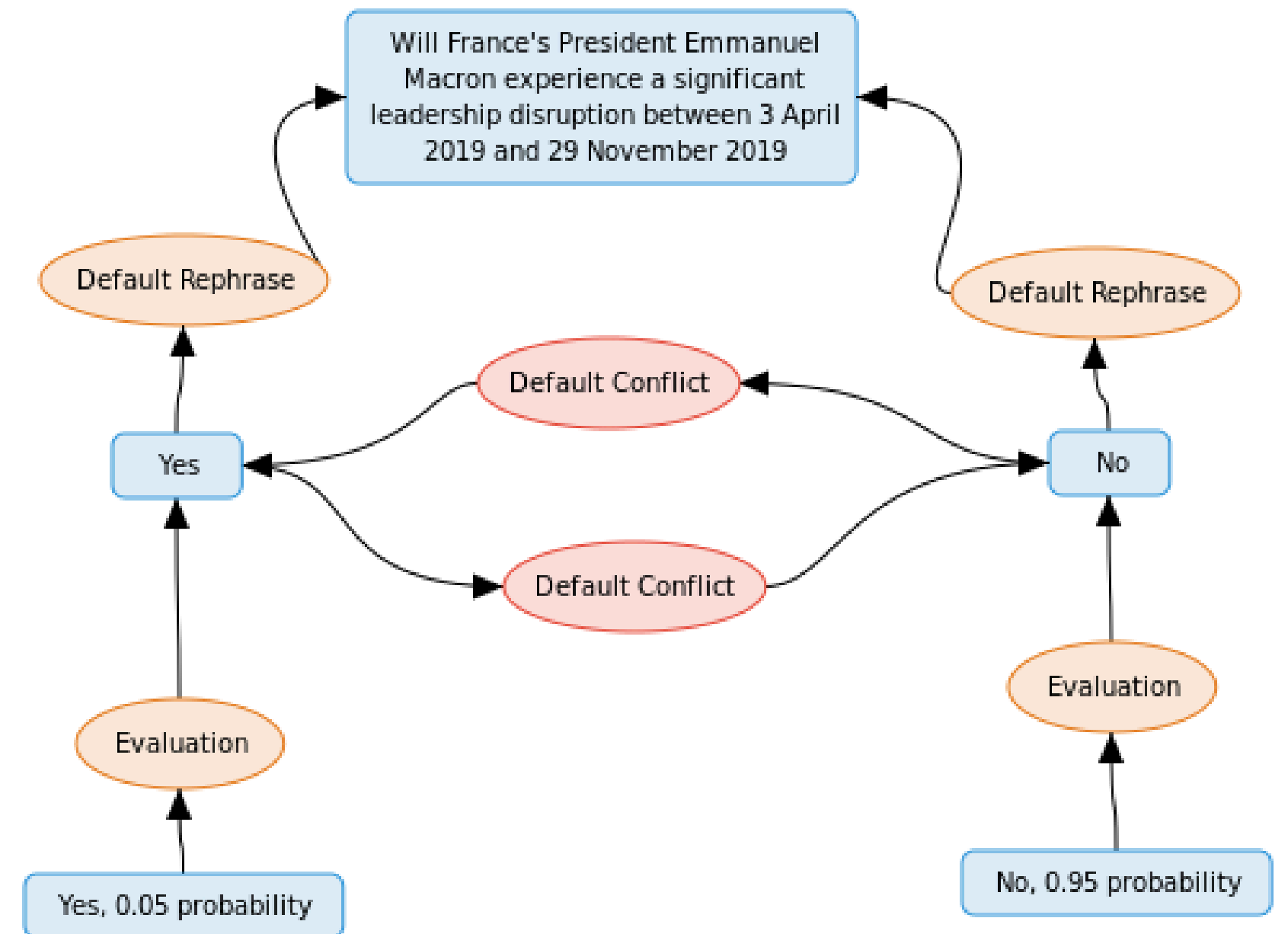
0.05

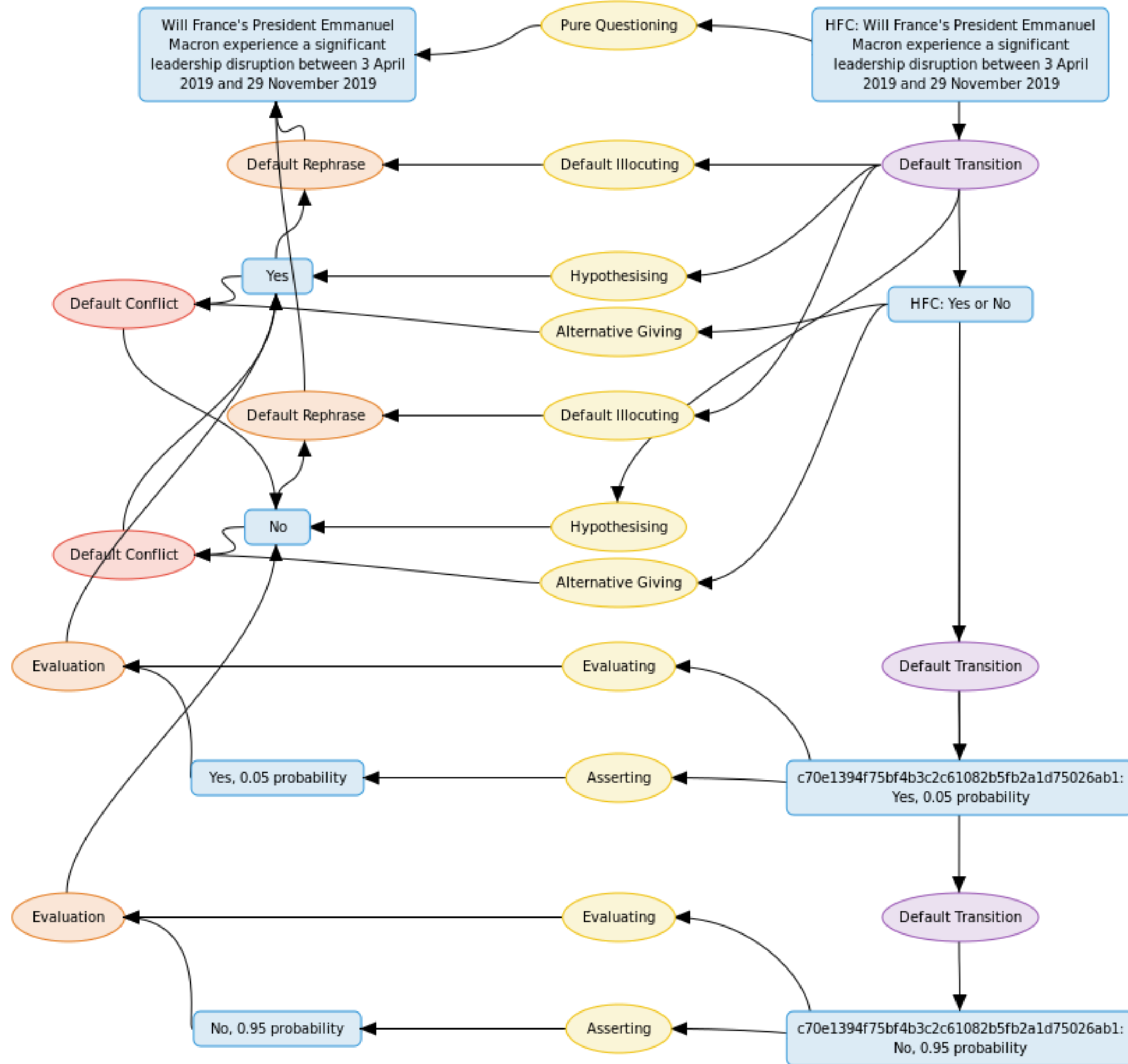
No

0.95

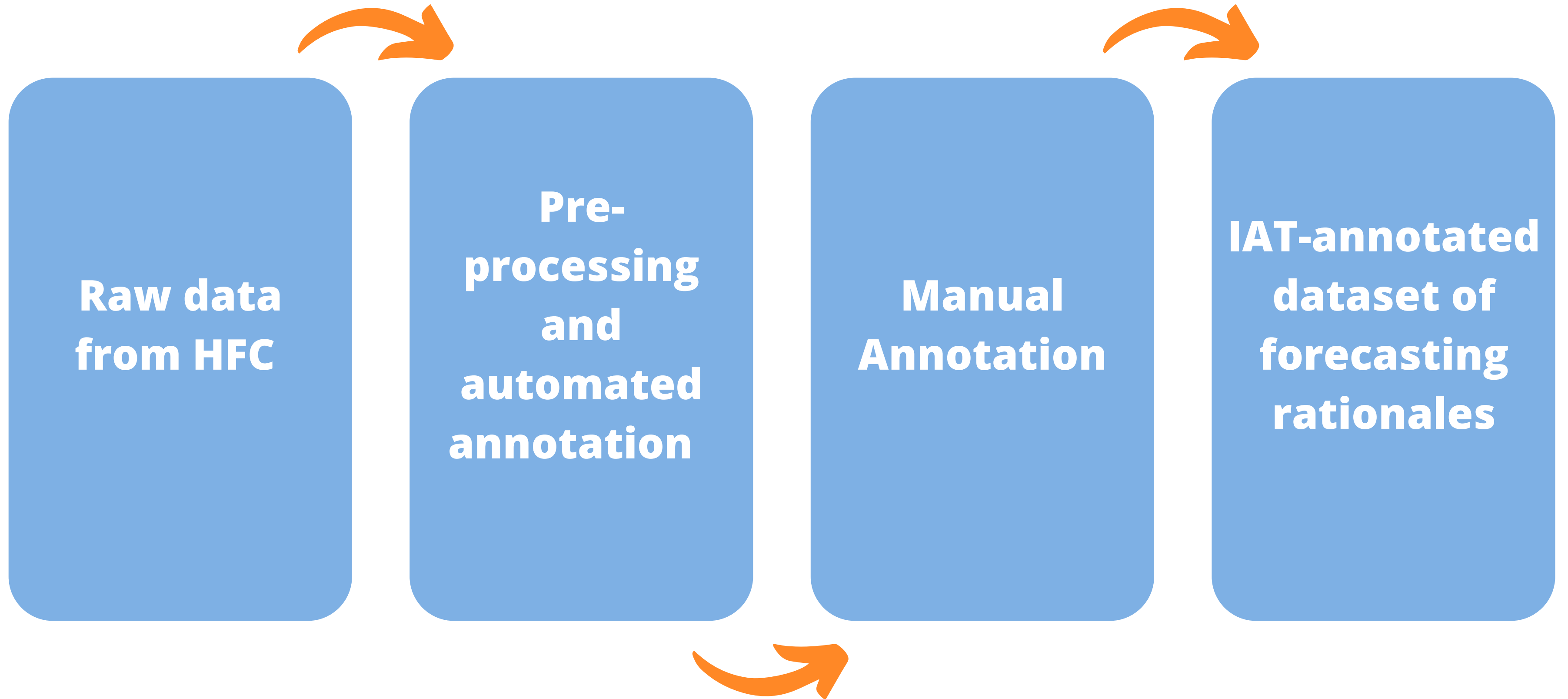
Rationale

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The Process



A solid blue rounded rectangle with rounded corners, centered on a white background. The text "Manual Annotation" is written in white, bold, sans-serif font in the center of the rectangle.

**Manual
Annotation**

A blue rounded rectangle with the text "Manual Annotation" centered inside it.

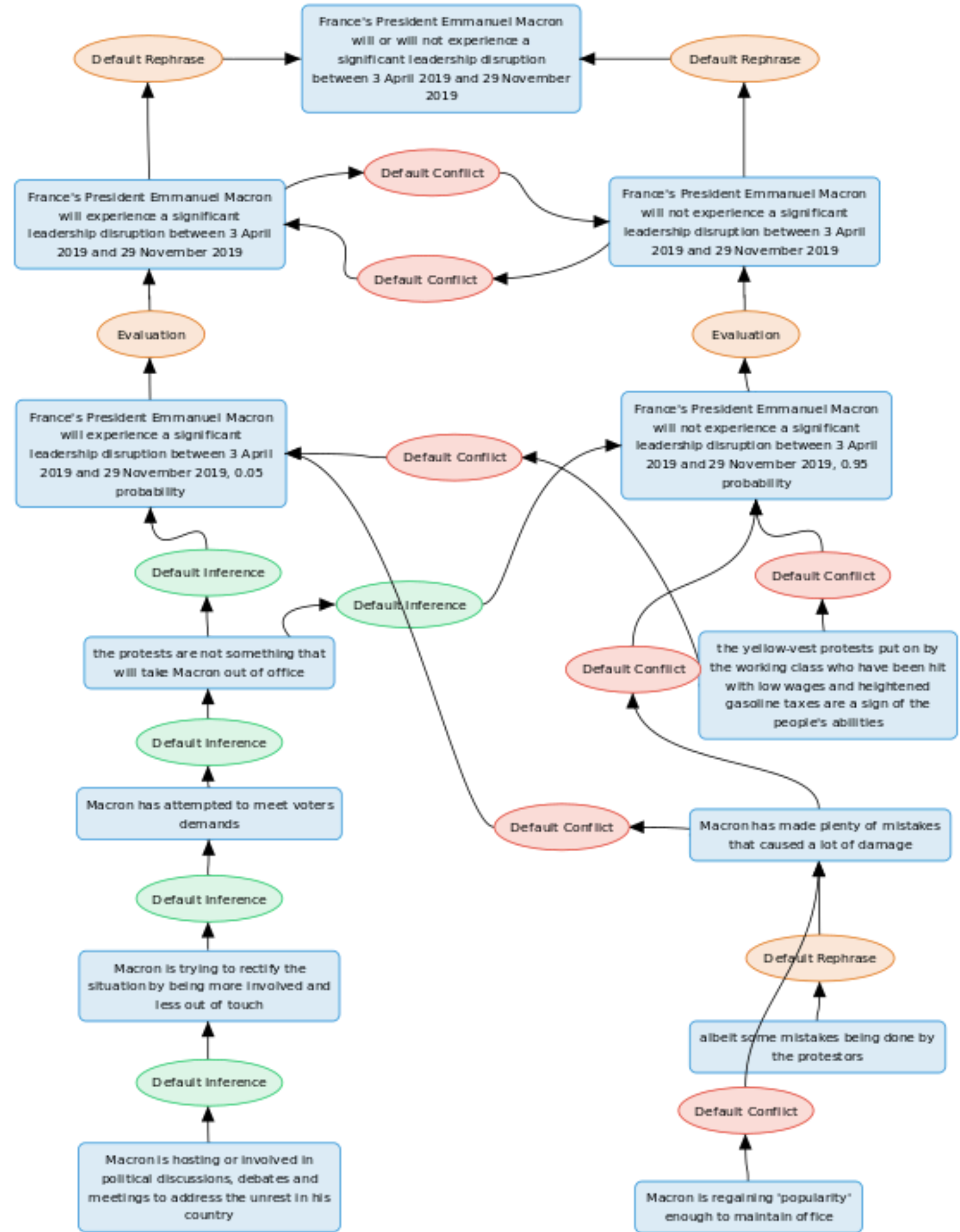
**Manual
Annotation**

Manual Annotation

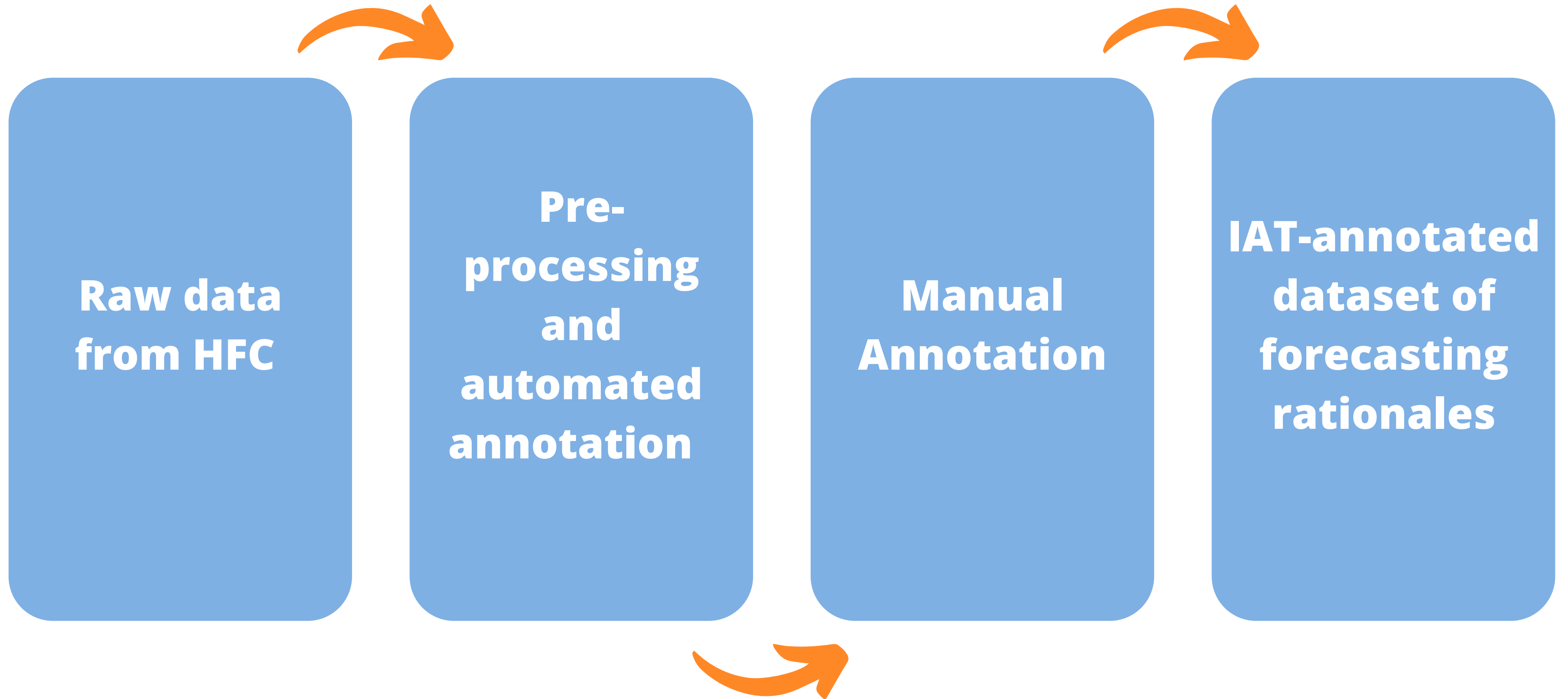
- **The annotation is completed by 11 annotators**
- **Trained in Inference Anchoring Theory (IAT)**
- **Annotation is peer-reviewed**

Inter-Annotator Agreement

- **CASS-κ = 0.78**



The Process



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dataset of
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Feature	Count
Rationales	205
-- (which are updates)	85
Questions	100
Hypotheses	353
Support Relations	968
Conflict Relations	946
-- (which are not alternative hypotheses)	74
Words	31556

The work presented here covers the creation of a unique dataset of prediction rationales that provides a uniquely fine-grained and close characterisation of the structure of argumentation, with potential impact on forecasting domains from intelligence analysis to investment decision-making.

Future Work

- explore the argumentative strategies used when making forecasts
- explore whether there is a correlation between any argumentative strategies and forecast accuracy

Find Out More



FORECAST2023 provides a first step towards the argumentative analysis of forecasting rationales, which opens the door to deeper analysis among other things: how argumentative strategies affect decision-making, the key strategies accurate forecasters use to come to decisions, and exploring how decision-making can be improved across various domains.

The fully annotated corpus, the code used to develop the automated annotation and pre-processing, and the manual annotation guidelines are all openly available online.

<https://linktr.ee/forecast2023>

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