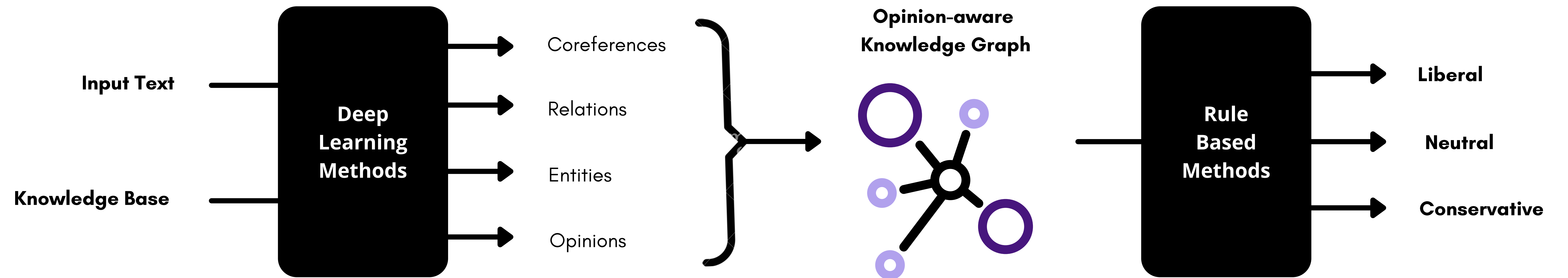


INTRODUCTION

Current stance detection methods don't use the extensive **background knowledge** that human readers have. This makes the algorithms superficial in their classification: they can only predict the stances towards entities directly mentioned in the text and won't be able to detect subtle connections between entities.

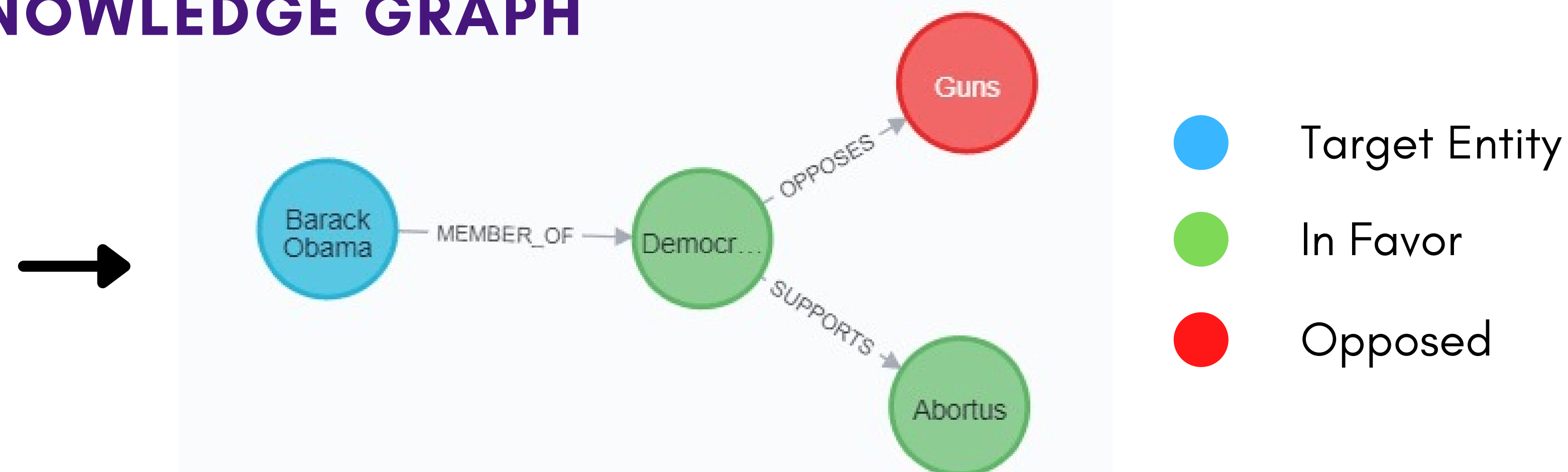
This lack of background knowledge could be solved by the usage of **knowledge graphs**.

METHODOLOGY



OPINION-AWARE KNOWLEDGE GRAPH

"Guns kill people, abortion gives people a choice."



FORMULAS

OPINION LINKING

$$\begin{cases} libOp = \frac{1}{|L|} \sum_{L_i \in L} \left(\frac{1}{|L_i|} \sum_{d_j \in L_i} s(d_j) \right) \\ conOp = \frac{1}{|C|} \sum_{C_i \in C} \left(\frac{1}{|C_i|} \sum_{d_j \in C_i} s(d_j) \right) \end{cases}$$

OPINION PROPAGATION

$$\begin{cases} libOp = - \sum_{j=1}^p \log [P(r_j)] \cdot libOp_j \\ conOp = - \sum_{j=1}^p \log [P(r_j)] \cdot conOp_j \end{cases}$$

SENTENCE CLASSIFICATION

$$ideology = \frac{\sum_{v \in V} (libOp_v \cdot OO_v - conOp_v \cdot OO_v)}{|V_T|}$$

OPINION ORIENTATION

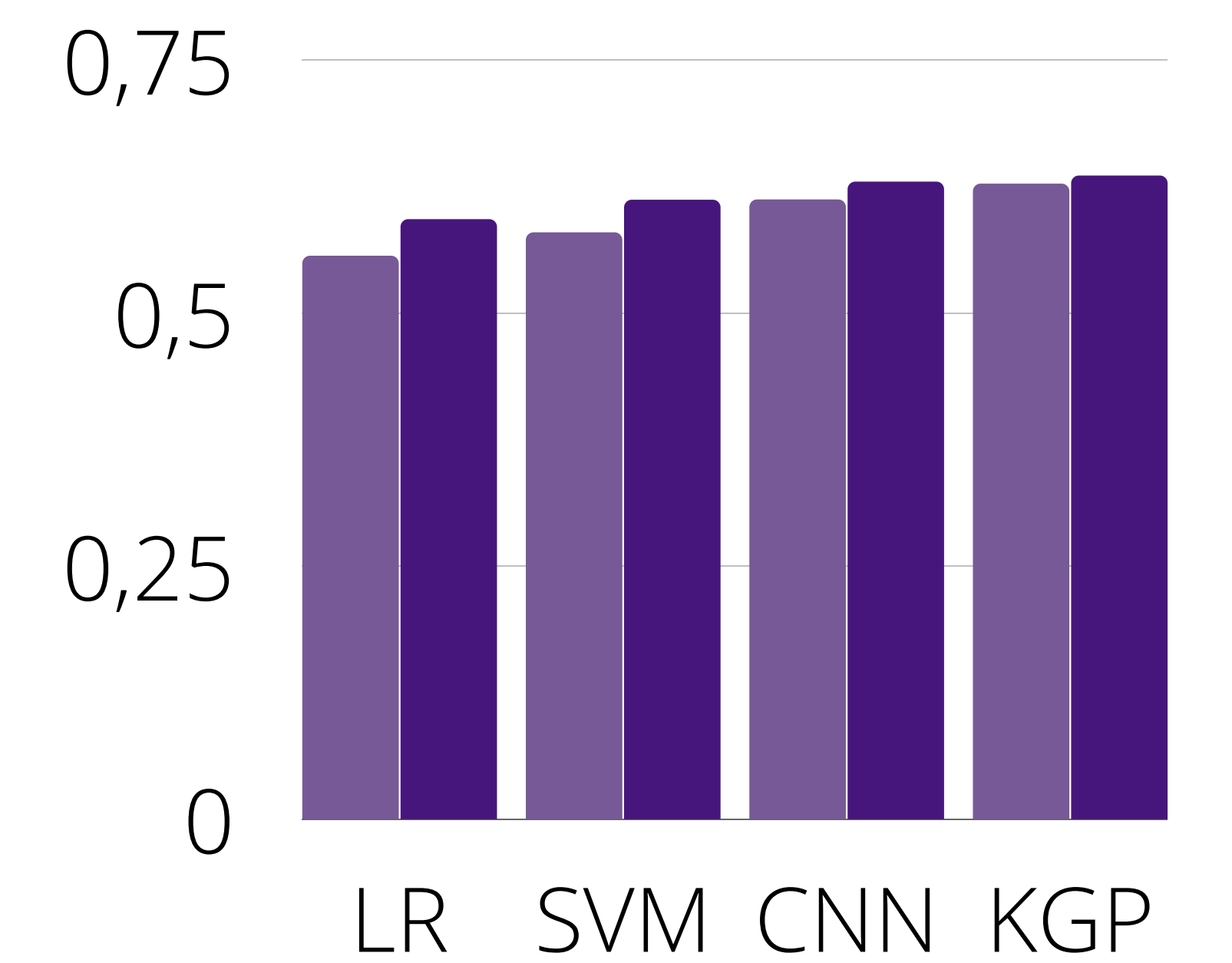
$$OO_v = \text{sign} \left(\sum_{d_v \in T} s(d_v) \right)$$

RESULTS

DATASETS

- SemEval2016 Dataset
- IBC Dataset

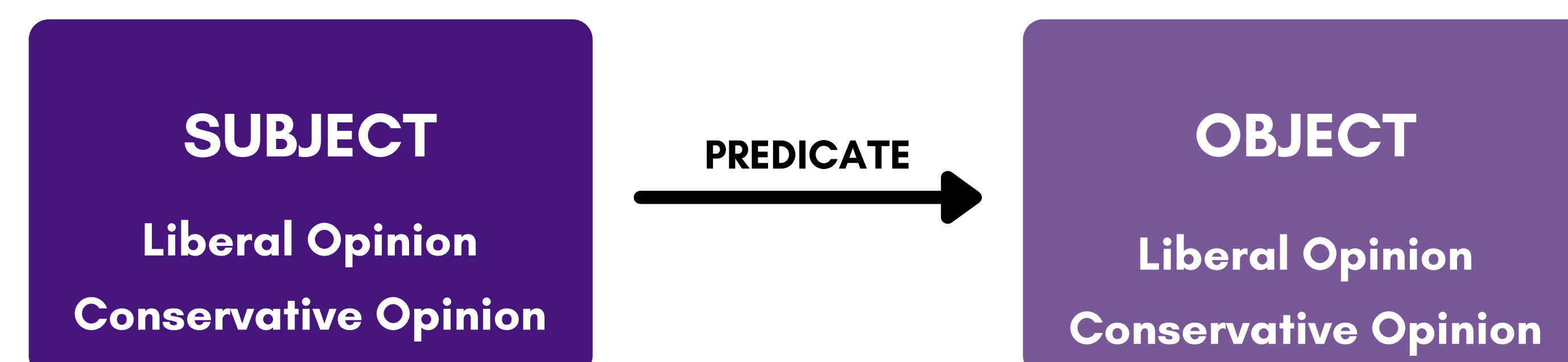
F-SCORES



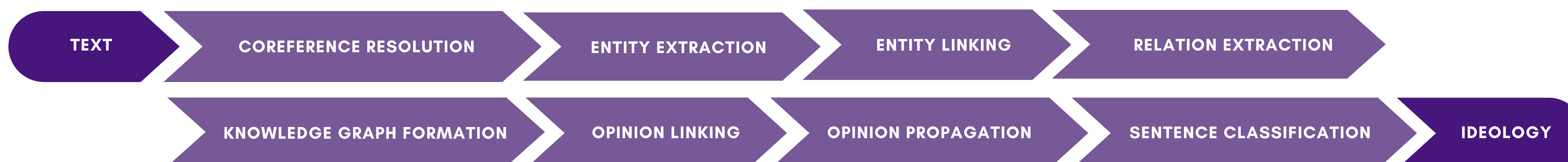
→ KGP Average F-score = **0.63**

RDF-TRIPLE

Describes the relations between the entities. Each entity stores expected liberal and conservative opinion.



THE PIPELINE



REFERENCES

- Opinion-aware Knowledge Graph for Political Ideology Detection (Chen W. et al., 2017)
- Opinion-Aware Knowledge Embedding for Stance Detection (Xu Z. et al., 2019)

EXPLANATION FORMULATION