

1. Motivation

- Legal documents are **difficult to comprehend** due to length and use of *legalese*.
- It is important to understand the **obligations**, **entitlements**, **prohibitions**, and **permissions** mentioned in a contract.
- Limited availability of annotated datasets** is a bottleneck in using NLP methods for *legalese* understanding.

- (1) a. Tenant **shall** pay the rent to the Landlord. **Modal Triggers**
b. Landlord **shall not** obtain financing or enter into any agreement affecting the Property.
c. Landlord **may** continue this Lease in effect after Tenant's abandonment and recover Rent as it becomes due.
- (2) a. Tenant **agrees** to pay the rent. **Non-Modal Triggers**
b. Landlord **is responsible for** maintaining the structural soundness of the house.

Why LexDeMod?

- Need to condition deontic modality detection on a given agent.
- A sentence may express multiple deontic types.
- Need to capture both modal and non-modal triggers.

2. LexDeMod Curation

- Lease agreements from LEDGAR corpus.
- Extract different aliases used to refer to a contracting party (or *agent*) using regex.

Deontic Type	Description
Obligation (Obl)	Agent is required to have or do something
Entitlement (Ent)	Agent has the right to have or do something
Prohibition (Pro)	Agent is forbidden to have or do something
Permission (Per)	Agent is allowed to have or do something
No Obligation (Nobl)	Agent is not required to have or do something
No Entitlement (Nent)	Agent has no right to have or do something

Taxonomy for deontic type annotation

- For each agent and a sentence collect two types of annotations via AMT.
 - All deontic types expressed for an agent.
 - Trigger* phrase which expresses each of the selected types.

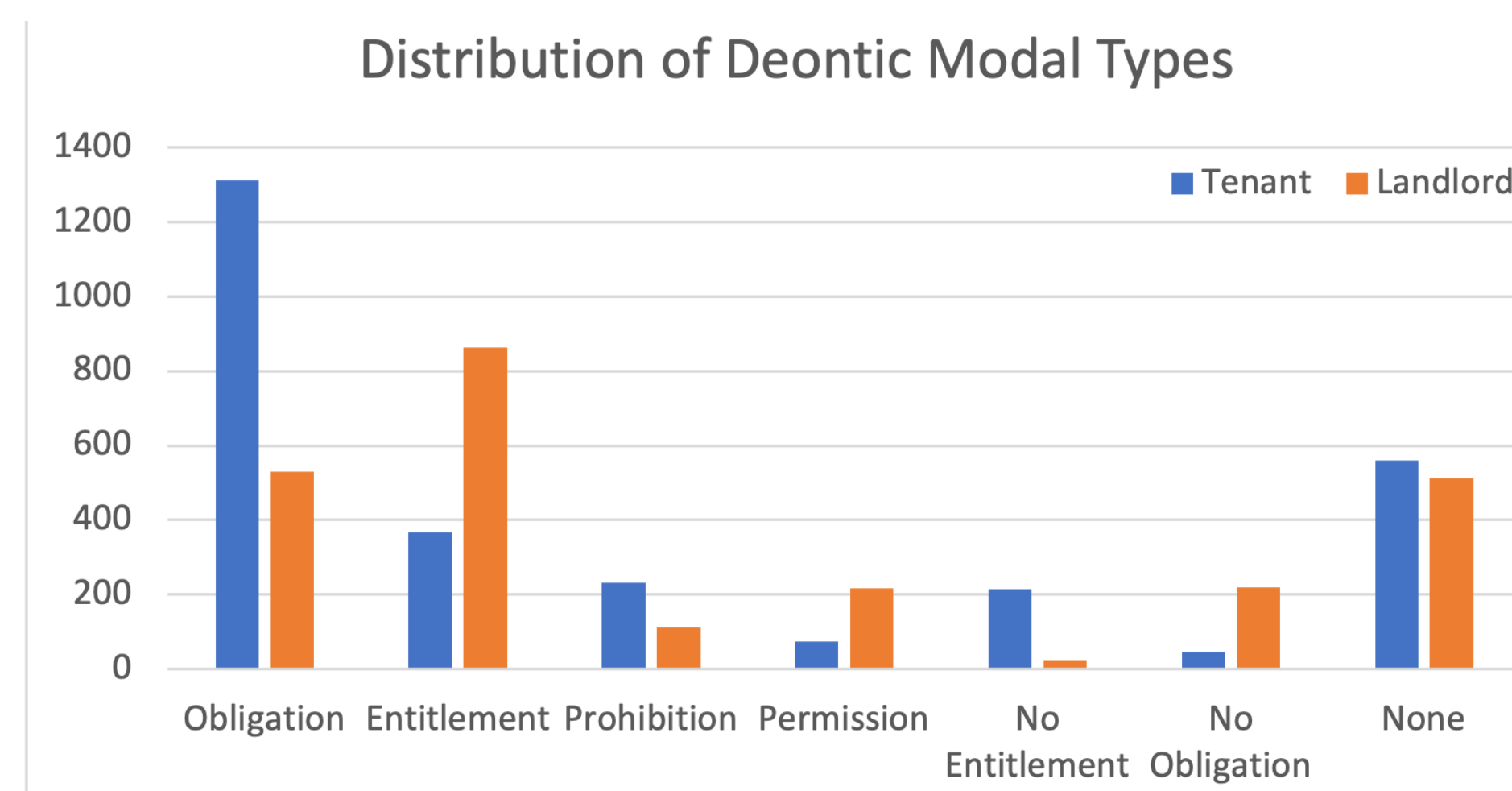
1. Select category(s) expressed in the sentence with respect to **landlord** and corresponding trigger word/phrase.

OBLIGATION ENTITLEMENT PERMISSION PROHIBITION NO OBLIGATION NO ENTITLEMENT ☐ No category expressed

Landlord **shall not be responsible** to Tenant for any disruption or any other problem involving the electrical service supplied by such solar panels and Landlord **will have** sole ownership of any or all of Landlord's Power Generating Systems that **may be installed** by landlord from time to time.

Annotation interface

3. Qualitative and Quantitative Analysis



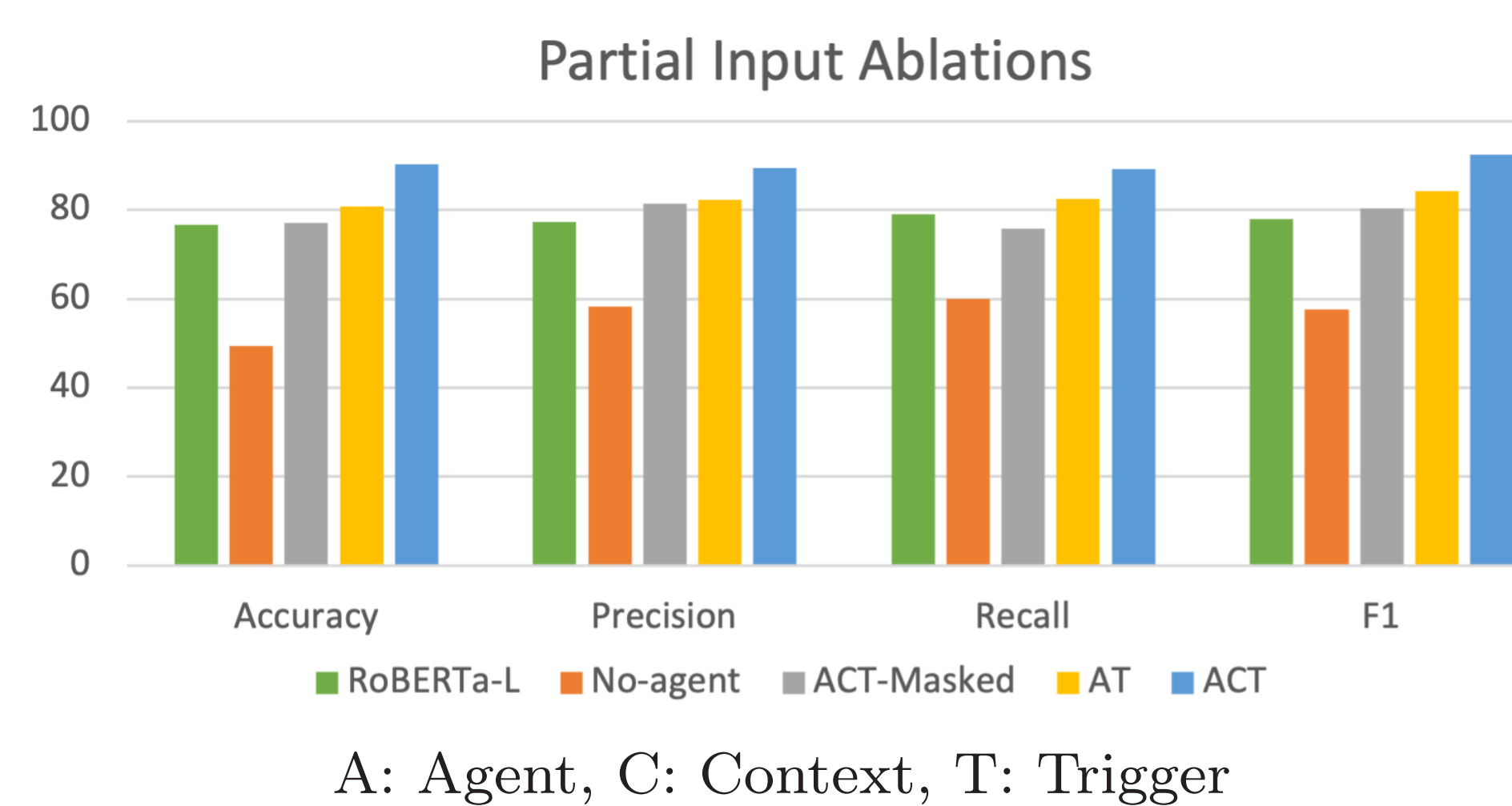
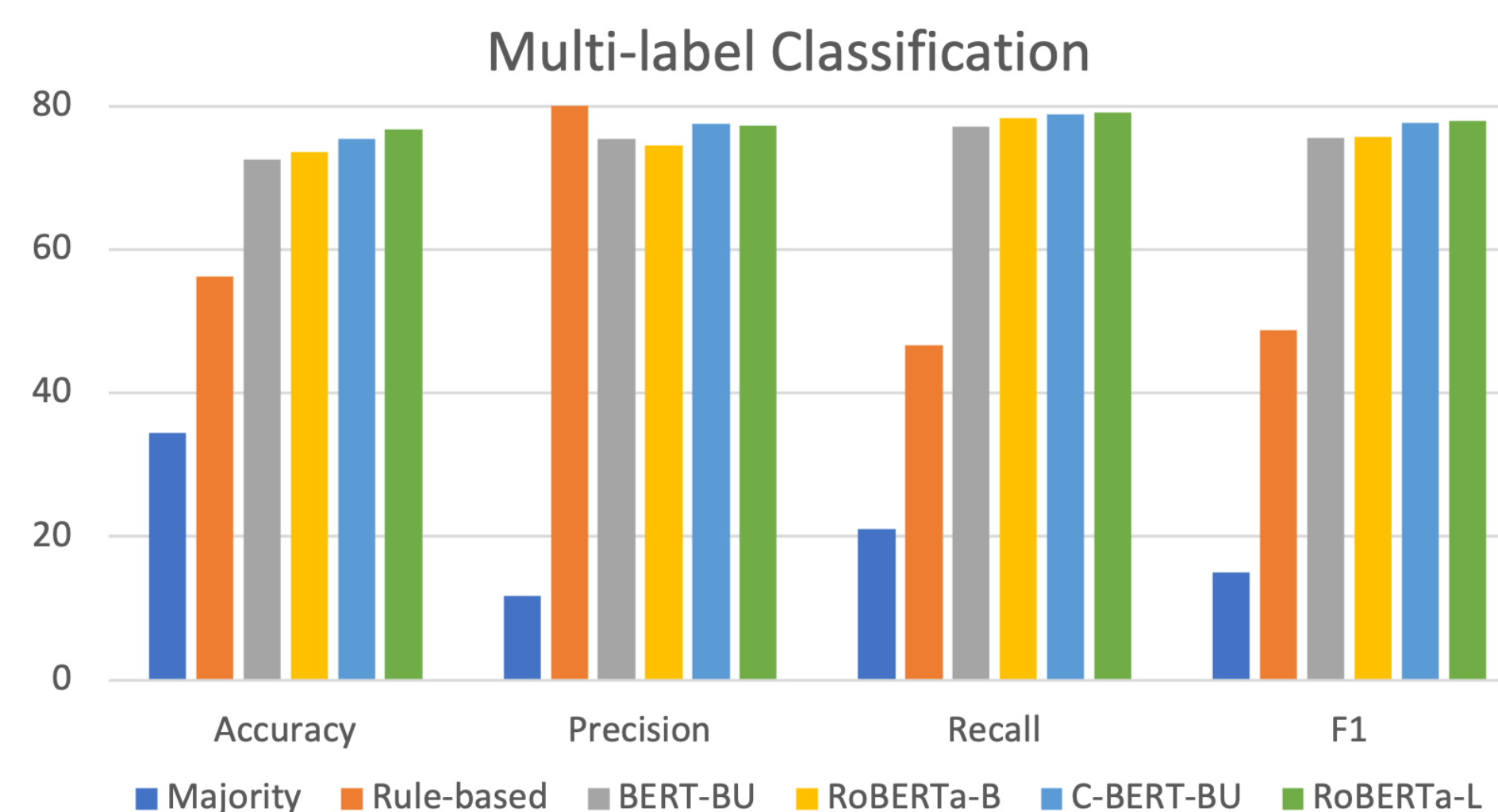
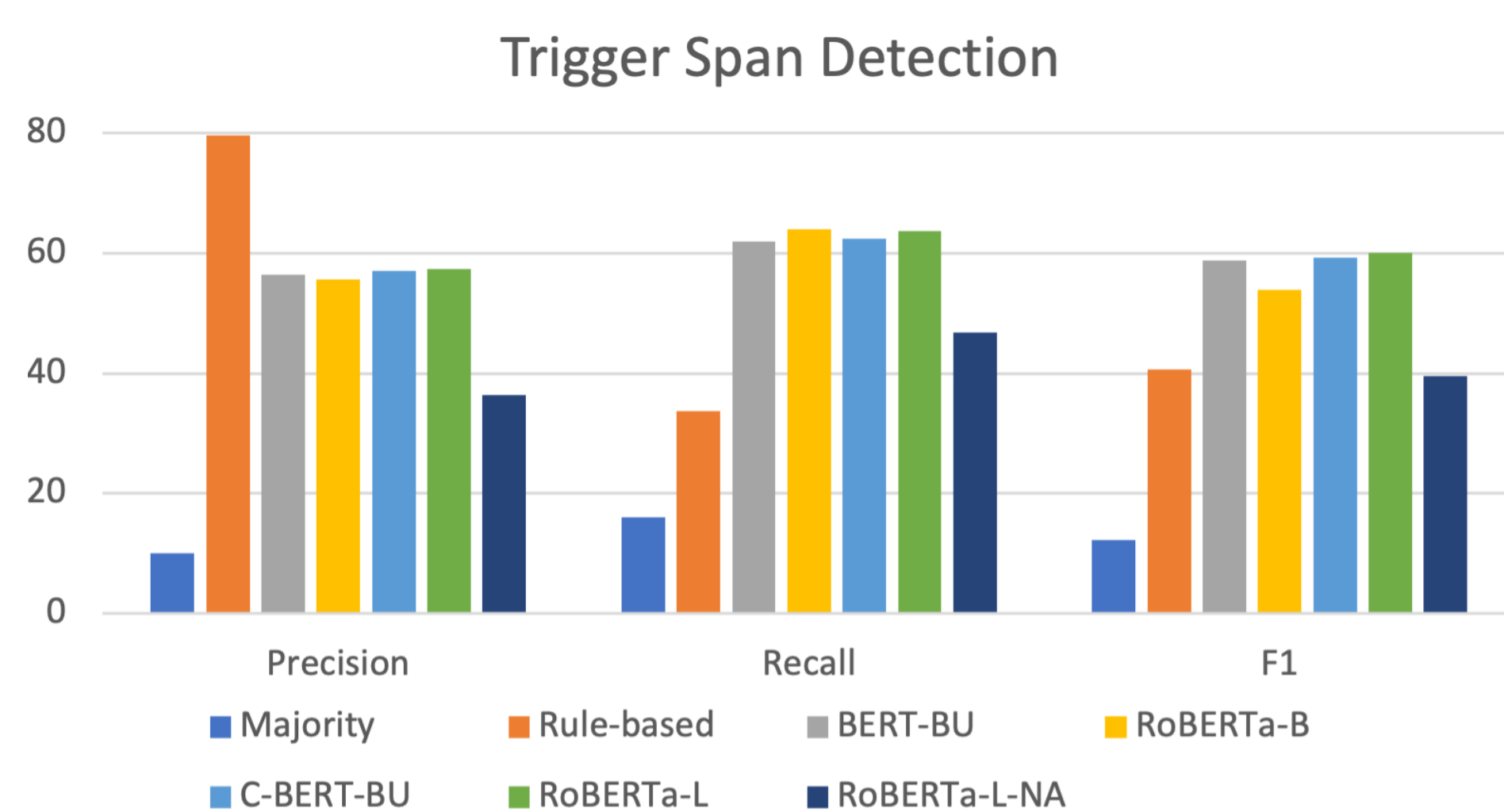
- 17.3% of the sentences have multiple trigger annotations, 48.6% of these sentences express multiple deontic types.
- 14.9% of prohibitions are expressed using negation words between the context (e.g., 'neither lessor nor lessee may').
- Overall 383 unique triggers.
- 24.8% of the sentences do not express any deontic type.

Type	Top 10 triggers
Obl	shall, will, agrees, agree, acknowledges, acknowledge, represents and warrants, shall be responsible for, undertakes, will be responsible for
Ent	shall, will, agrees, shall have the right to, shall be entitled to, represents and warrants, acknowledges, waives no rights, shall not, retains all other rights, will be entitled to
Pro	shall not, will not, may not, nor shall, not to be, neither lessor nor lessee may, in no event shall, nor will, will not allow, nor may
Per	may, is permitted, will allow, has the right, shall, or at landlord's option, shall be permitted to, shall be allowed
Nobl	shall not be liable, shall not be obligated to, shall not be required to, shall, shall have no obligation to, in no event shall landlord be obligated to, waives, shall not, shall have no liability
Nent	shall, shall have no right to, waives no rights, shall not, shall have no obligation to, waives, shall not be required, shall not be obligated, waive the right, shall not have the right to

- 45.2% of the total unique triggers are non-modal expressions (e.g., agrees) covering 20.3% of the annotated trigger spans.

4. Proposed Benchmarking Tasks

- Agent-specific multi-label deontic modality classification.**
 - identify all the deontic types expressed for a given agent
- Agent-specific deontic modality and trigger span detection.**
 - identify both the deontic type and corresponding triggers for a given agent



- Transformer-based models can better capture the linguistic diversity of deontic modal expressions.
- Agent conditioning significantly improves the performance.
- Rule-based approach attains high precision but has low recall due to the non-robustness to capturing diverse linguistic expressions.

5. Beyond Lease Agreements

- Collected annotations for employment and rental agreements to investigate the **generalizability** of diverse linguistic expressions in LexDeMod to other agreement types.
- Performance drops due to lease-specific agent conditioning (e.g., tenant) during training while commonly occurring agents in employment agreements are employee, employer, etc.
- Train RoBERTa-L with **agent anonymized**.
 - AR**: all occurrences of an agent are replaced with the same token (e.g., a1 for Tenant)
 - ARR**: agent is randomly replaced with a token consistent within a sentence.

Model	Accuracy	Precision	Recall	F1
Multi-label Classification (Rental/Employment)				
Majority	36.36/27.45	11.87/8.80	19.10/15.15	14.46/11.11
Rule-based	41.56/47.45	53.77/64.63	34.54/35.00	33.27/37.22
RoBERTa-L	73.16/48.72	83.08/52.87	63.42/48.90	68.90/48.32
RoBERTa-L-AR	55.19/42.55	56.87/59.29	52.38/46.48	50.66/50.30
RoBERTa-L-ARR	70.35/64.68	76.79/70.05	63.14/64.62	65.89/65.36
Trigger Span Detection (Labeled) (Rental/Employment)				
Majority	96.09/97.37	18.33/4.23	1.90/7.08	3.42/5.30
Rule-based	96.40/97.83	56.25/59.66	23.69/19.65	29.62/27.45
RoBERTa-L	97.48/97.78	49.74/36.80	45.87/37.84	45.58/34.87
RoBERTa-L-AR	97.22/98.15	49.97/48.86	44.43/42.99	44.22/43.42
RoBERTa-L-ARR	97.60/98.38	59.42/53.14	47.83/43.84	49.61/45.47

6. Conclusion

- Introduce LexDeMod for deontic modality detection in the legal domain which consists of diverse linguistic expressions of deontic modality.
- Propose and benchmark two tasks: agent-specific multi-label deontic modality classification, and agent-specific deontic modality and trigger span detection using transformer-based models.
- Demonstrate the generalizability of diverse linguistic expressions captured in LexDeMod to employment and rental agreements.