

## Developing a Typology for Language Learning Feedback

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## Summary

- Current NLP **writing support** tools focus on **correcting errors**, not helping users learn from them.
- For **learning support**, educational research recommends detailed and specific **feedback comments**.
- **Our Goal:** Generate feedback comments which **diagnose** errors and **explain** the underlying reasons.
- **Challenge:** Error typologies cover changes to text, but feedback is often about **what rules were broken**.

## Writing Support vs. Learning Support

If I **am** you, I'd be angry.

GRAMMAR

am → were

It appears that your sentence or clause uses an incorrect form of the verb **am**. Consider changing it.

Learn more

- Designed to correct text, not teach users.
- May not explain why there is an error.
- One-click fixes can be applied without understanding.

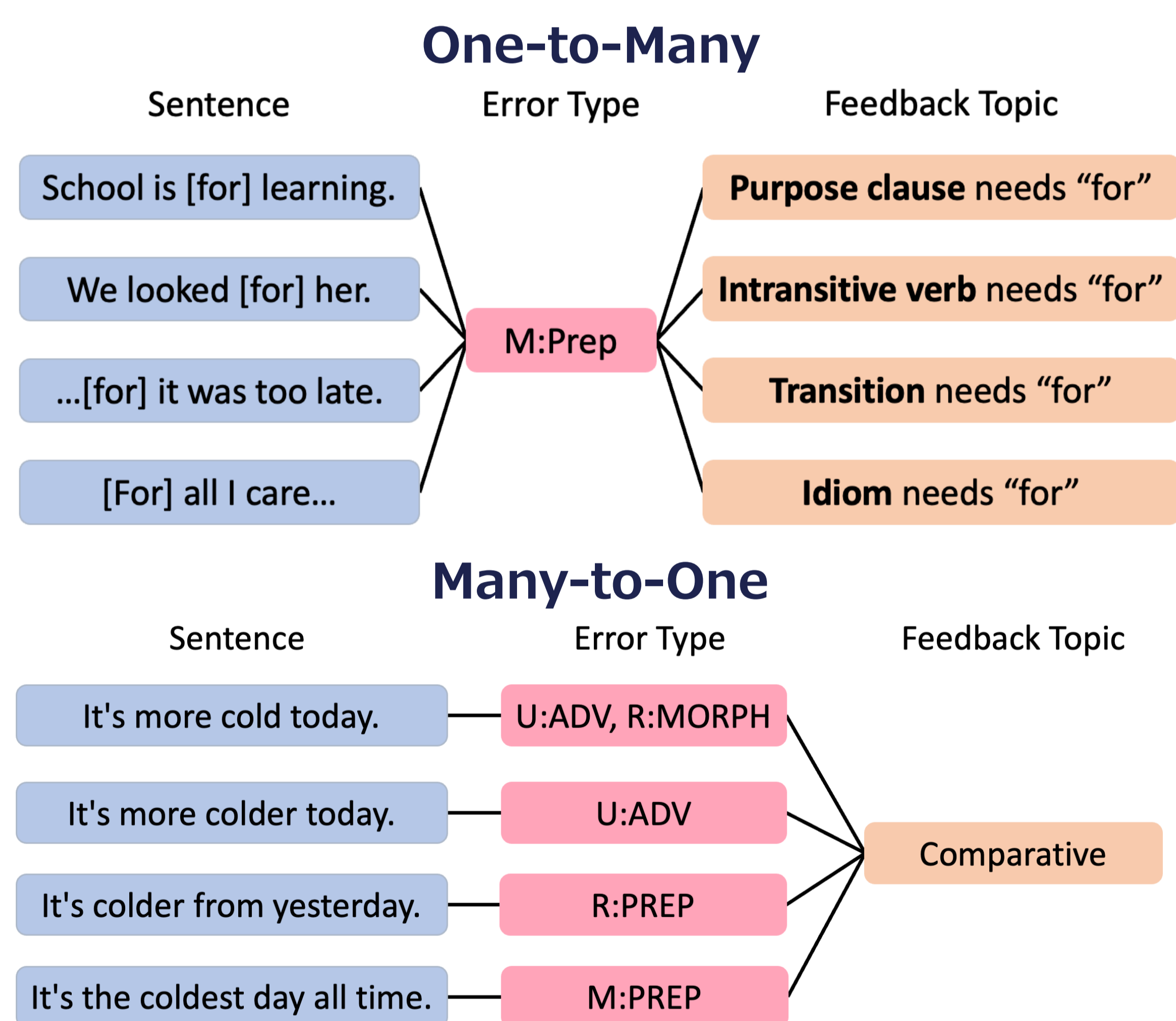
If I **am** you, I'd be angry.

In a **conditional** sentence like this one, the first verb should be in the past tense or subjunctive.

- Explains why "am" is wrong and what to change.
- Keywords for learning about the rule (conditionals).
- Writer has a chance to learn and apply the rule.

## Unsuitability of Error Typologies

- Error types from Grammatical Error Correction (GEC) **do not cover** broader **topics** identified in teacher feedback comments.
- The relationships between them can be complex:



Error types from ERRANT (Bryant et al., 2017)

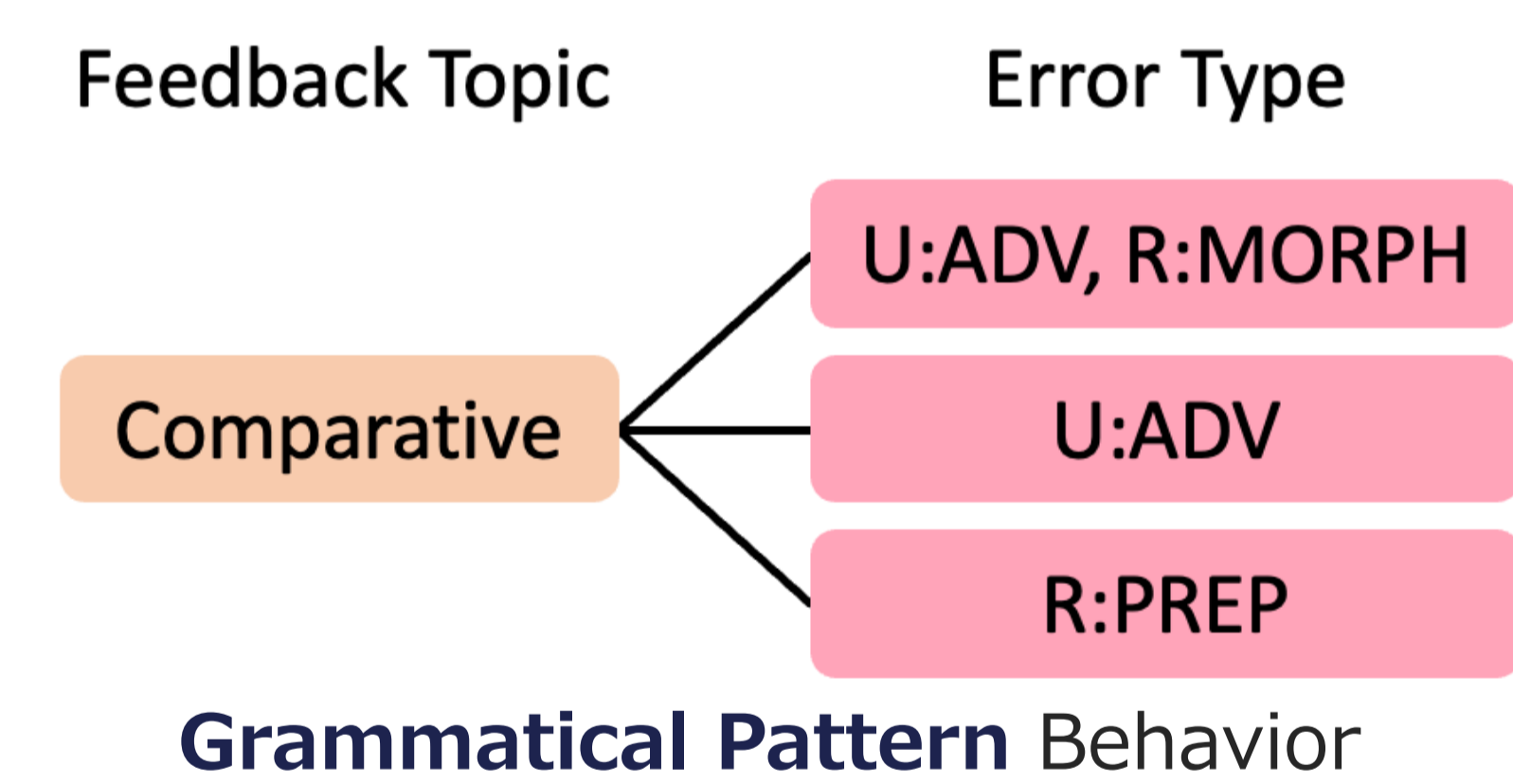
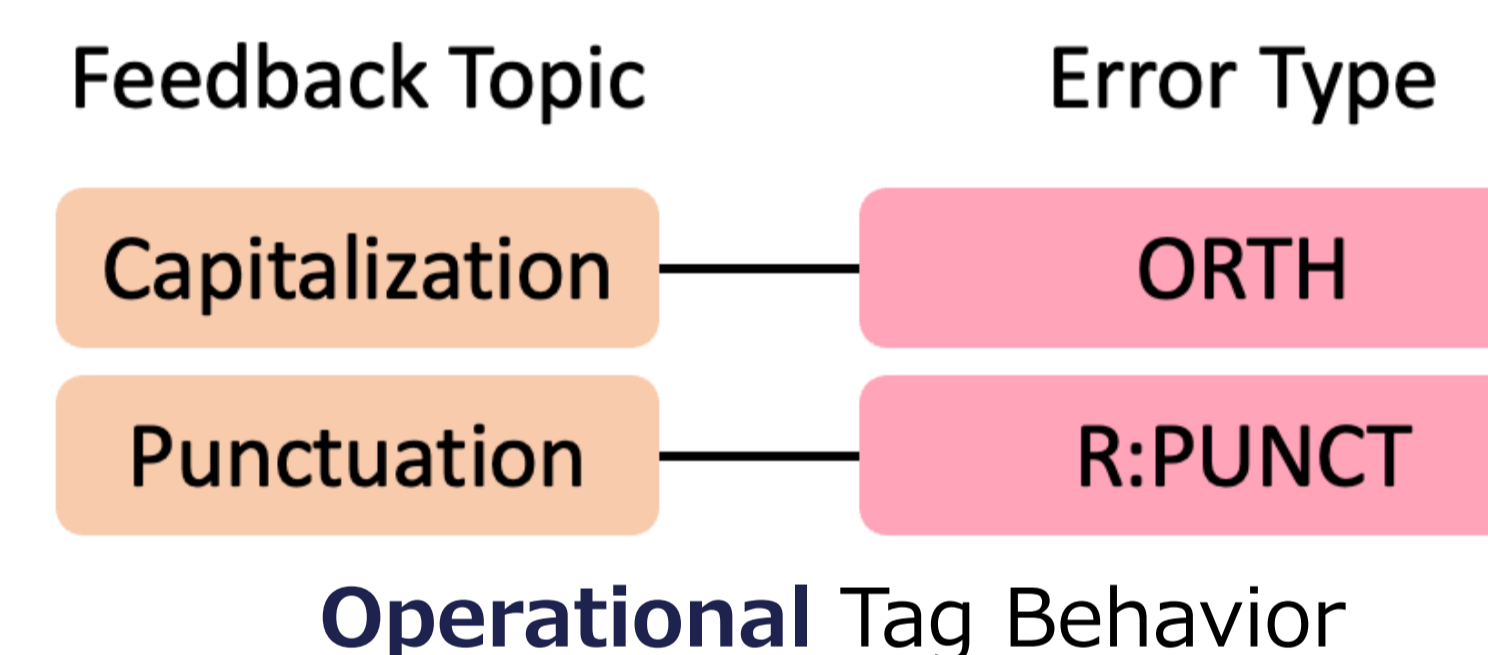
## Proposed System

## Annotations: Three levels of abstraction

**Operational:** Straightforward match with one or a few errors and edits.

**Grammatical Patterns:** Map to more complex sets or combinations of errors.

**Abstract:** May map to "any" or "none" of the possible combinations.



## Grammatical Pattern Tags

Tag Name	Example
Comparative	Maybe you will study [ <b>more hard</b> → <b>harder</b> ] in the class.
Preposition + Transitivity	I completely agree [ <b>with</b> ] this opinion.
Purpose Clause	They should earn money [ <b>for</b> → <b>to</b> ] spend in the daily life by themselves.
Transition	[ <b>But</b> → <b>However,</b> ] it costs a lot to go to the university.

Sample of proposed Grammatical Pattern Tags, a "middle level" of comment abstraction. See our paper for the full typology.

## Next Steps: Generating Feedback Comments

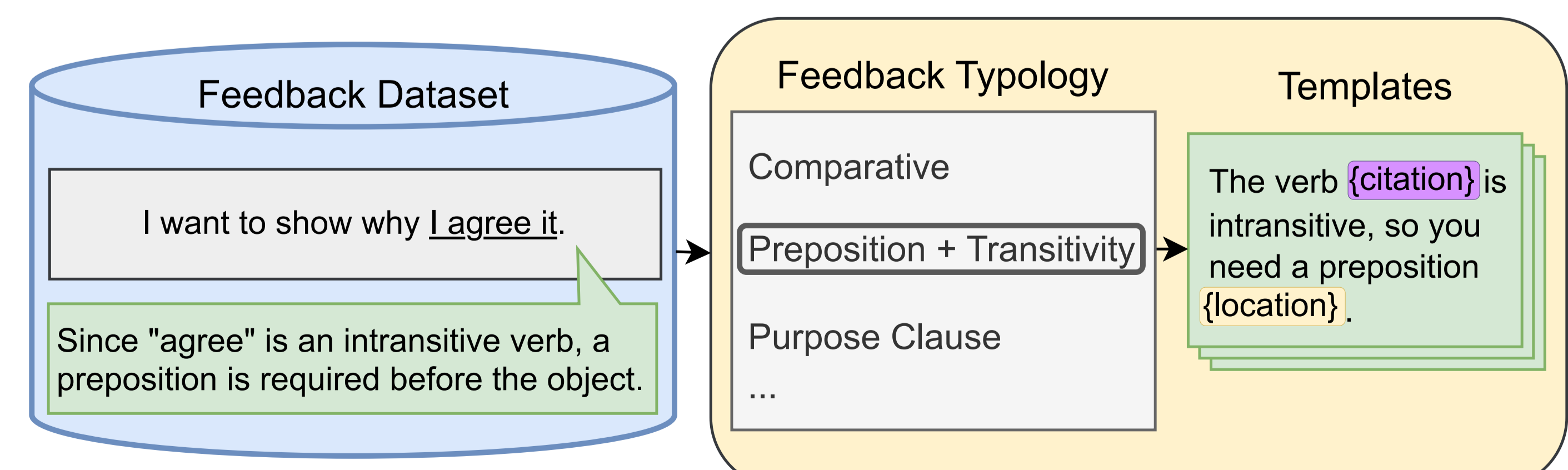
## Data: Instructor Feedback

I want to show some reasons why I agree it.

Since "agree" is an intransitive verb, a preposition is required before the object.



## Classify and Convert to Templates



Comments drawn from human-written examples in "ICNALE Learner Essays with Feedback Comments" (Nagata et al., 2020)

Templates with "slots" to fill with information from the sentence. Neural text generation may also be used for some feedback types.