Event factuality is determined by word meaning and enriched by pragmatics. BERT learns word meaning but not pragmatics.

He Thinks He Knows Better than the Doctors: **BERT for Event Factuality Fails on Pragmatics**

Intro

Jo managed to stay³ on his horse. 🦫

Jo did not manage to stay-2.5 on his horse. W

Theory: clause-embedding verbs' signatures determine factuality (Kartunnen 2012) manage: +/- know: +/+ wish: o/o

Findings

- Distance between expected inference and annotations predicts model errors, supporting hypothesis
- Models learned fine-grained

Datasets

Which events?

- All: FactBank, UW, MEANTIME, UDS-IH2
- Embedded only: MegaVeridicality, CommitmentBank, RossPavlick
 - Entailment canceling environment: negation, modal, question, conditional

Theory falls short: signatures do not align with annotations, pragmatics enriches

They're French, but wish that they were^{-2.5} mostly Caribbean.

Hypothesis: Model learns surface patterns,

fails when pragmatics overrides

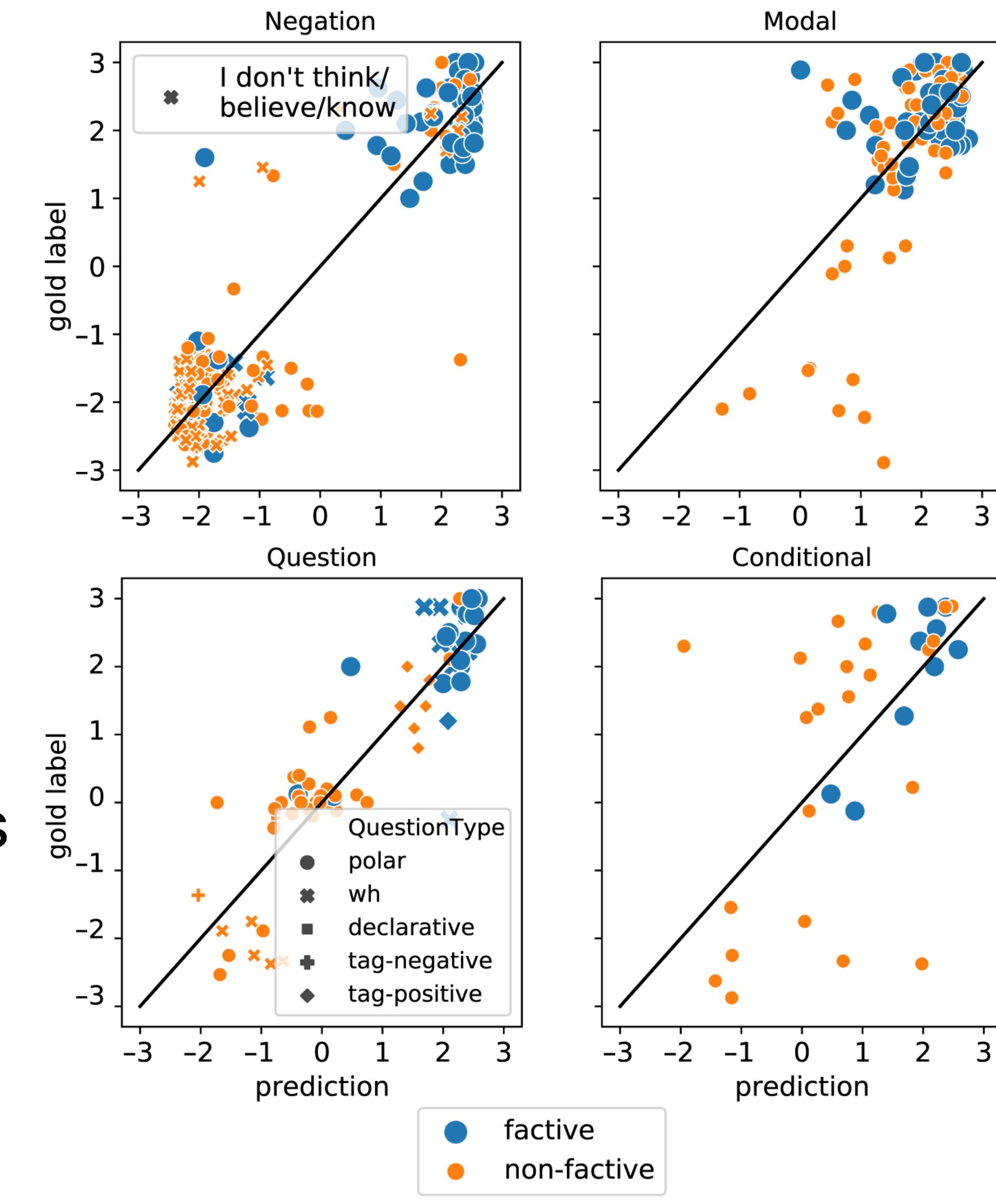
Model

- Fine-tune with BERT, extract event spans
- Regress to annotations in [-3,3]
- Multi-task learning with 7 English datasets

Analysis: Expected inference

features not incorporated in

theory e.g. question types



- Frame: forget to/that Who annotated?

- Expert lexicalist (FactBank)
- Crowdworkers

What pragmatics?

- Prior probability of events
- Context
- **Discourse Function**
- Tense/Aspect
- Subject Credibility
- Subject-Complement Interaction for

factuality based on the surface patterns

- rule-based predictions, or
- Mean annotations of similar training items

Model prediction vs. gold label for CB items under each entailment-canceling environment

Prospective Events

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