Automatically Summarizing Medical Literature Using Comparative Sentences Structure

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Background

- Head-to-head comparisons of viable clinical alternatives are critical for Comparative Effectiveness Research (Sox, Helfand et al. 2010).
- Even in studies that don't include viable clinical alternatives, authors compare drug results to a control population.
- From a linguistic perspective comparisons have been called "almost notorious for their syntactic complexity" (Bresnan, 1973).

Goal

Our goal is to summarize literature based on the specific entities (agent and object, depicted in bold) being compared and the basis of the comparison (depicted in italics)

> In the present study, *uterine weights* of intact animals treated with **TAM** was decreased as compared with **controls**, although not significantly. 12189200

Approach

- Build on earlier work that identifies comparison sentences (Hoon Park & Blake, 2012).
- Focus on identifying specific noun phrases in comparison sentences that correspond to each of the two compared entities (agent and object) and the basis of comparison (aspect of change).
- Create features from the dependency graph representation (Stanford dependency parser version 3.2.0, de Marneffe et al., 2006).
- Apply two classifiers: support vector machine (SVM) and generalized linear model (GLM).

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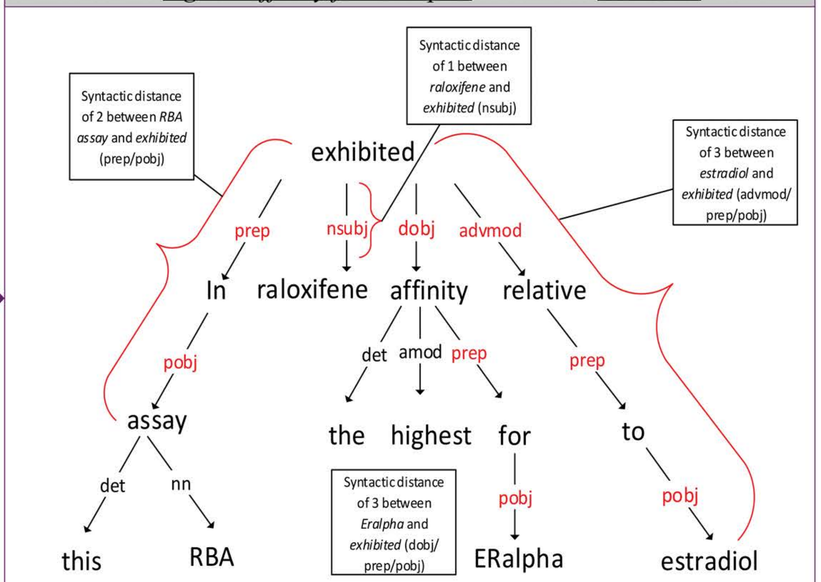
Results

- Transition phrase verbs that indicate change and evidence were effective features.
- The SVM classifier worked better than GLM (or Naïve Bayes or decision trees, data not shown here).
- The second entity (the object) was easiest to identify. The first entity (agent) and the basis of change were more difficult.
- These results provide raw materials necessary to create a summary of medical literature using comparative sentences.

Figure 1: Features from the sentence "In this RBA assay, **raloxifene** exhibited the *highest affinity for ERalpha* relative to **estradiol**" 10579349



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