

The Effects of Lexical Resource Quality on Preference Violation Detection

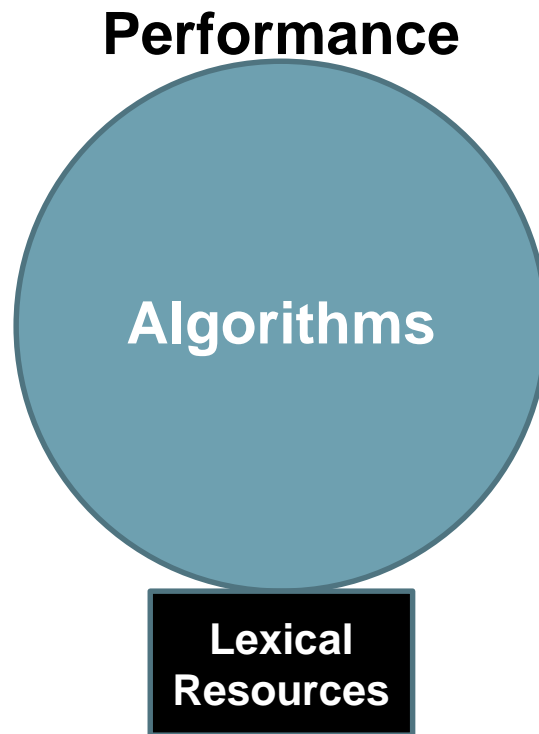
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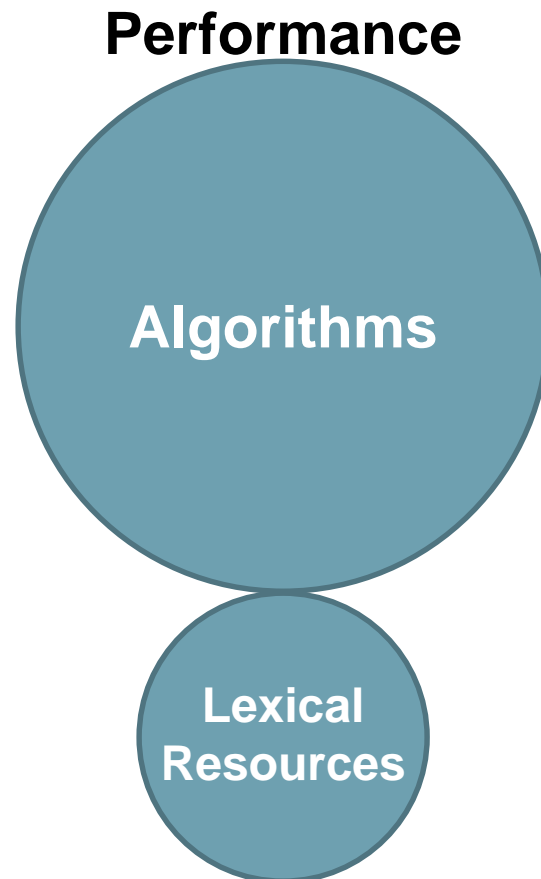
Resources often play second fiddle to algorithm development.

The usual model:



Curating resources interacts synergistically with algorithmic improvements.

A better model:



Linguistic resource improvements needed for better POS tagging [Manning 2011]

Task: detect selectional preference violations (as a proxy for metaphors).

The politician **pruned laws** regulating plastic bags, and created new fees for inspecting dairy farms.

Preference violation → likely metaphor [Wilks 1978]

Corpus:

- 715 sentences
- 2 annotators following manual
- Each clause marked for violations under most concrete meaning

The politician pruned laws regulating plastic bags



SENN

The politician pruned laws regulating plastic bags

ARG0

V: PRUNE

ARG1

Proposition Bank



SemLink

The politician pruned laws regulating plastic bags

AGENT: CARVE-21.2-2

PATIENT:

+ INT_CONTROL

+CONCRETE



The politician pruned laws regulating plastic bags

+ animate_being.n.01 OR
+ person.n.01 OR
+ machine.n.01 OR

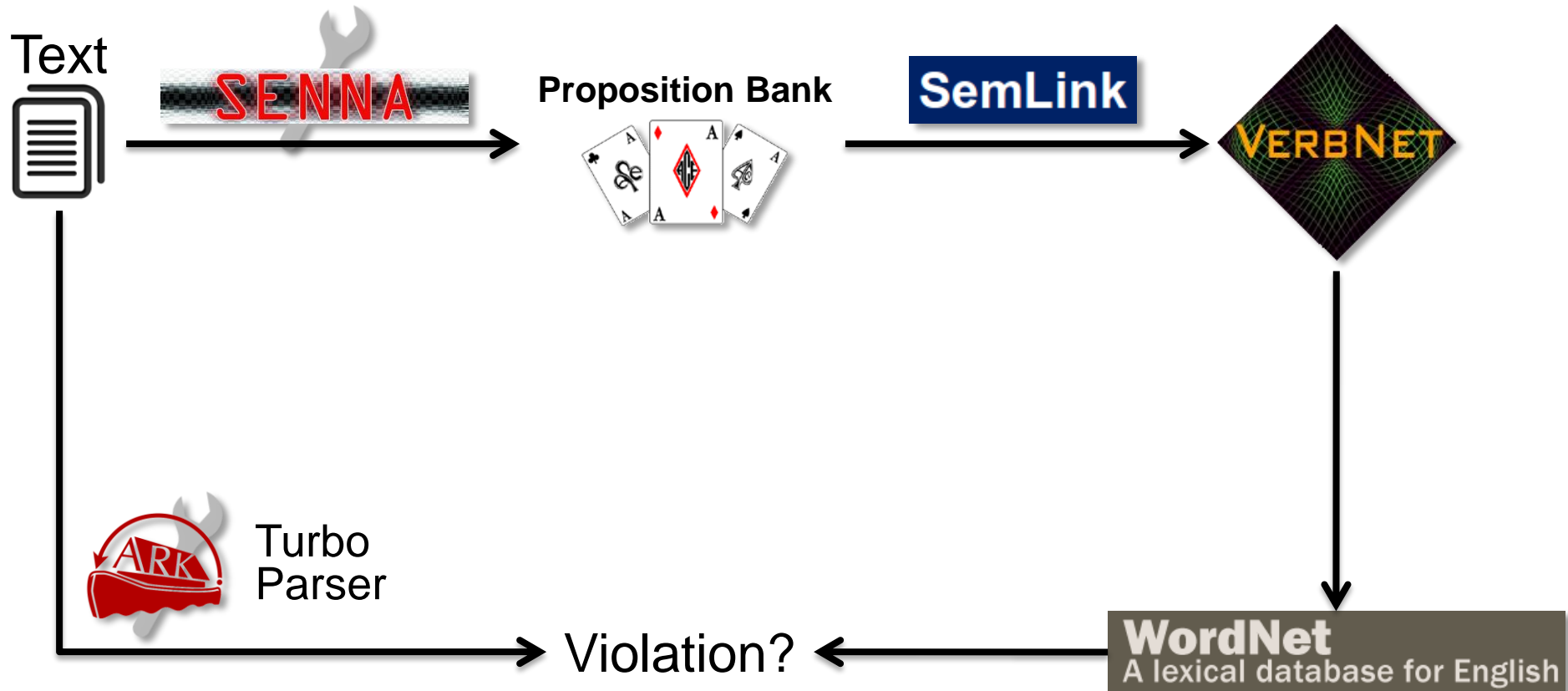
+ physical_object.n.01 OR
+ matter.n.01 OR
+ substance.n.01

...

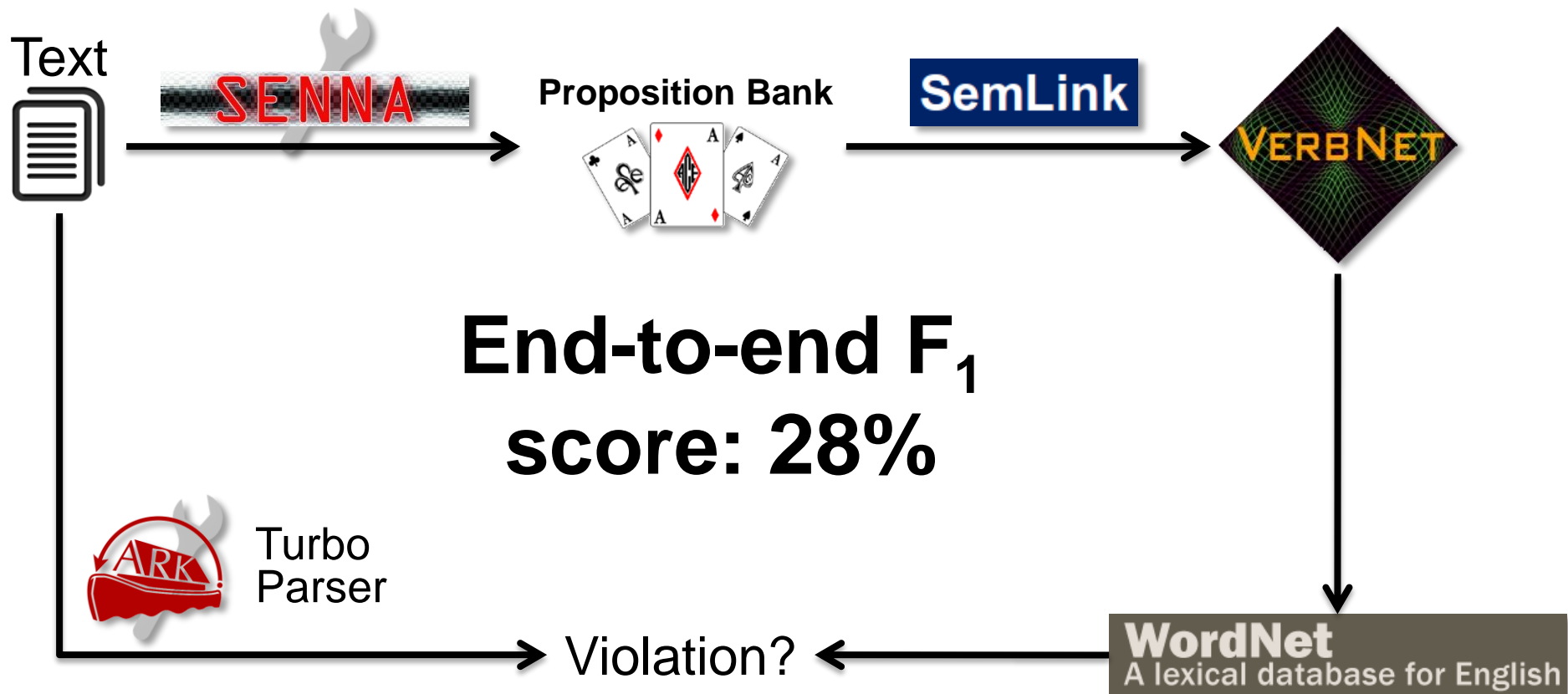
WordNet
A lexical database for English

Violation!

DAVID unifies 6 tools & resources to detect preference violations.

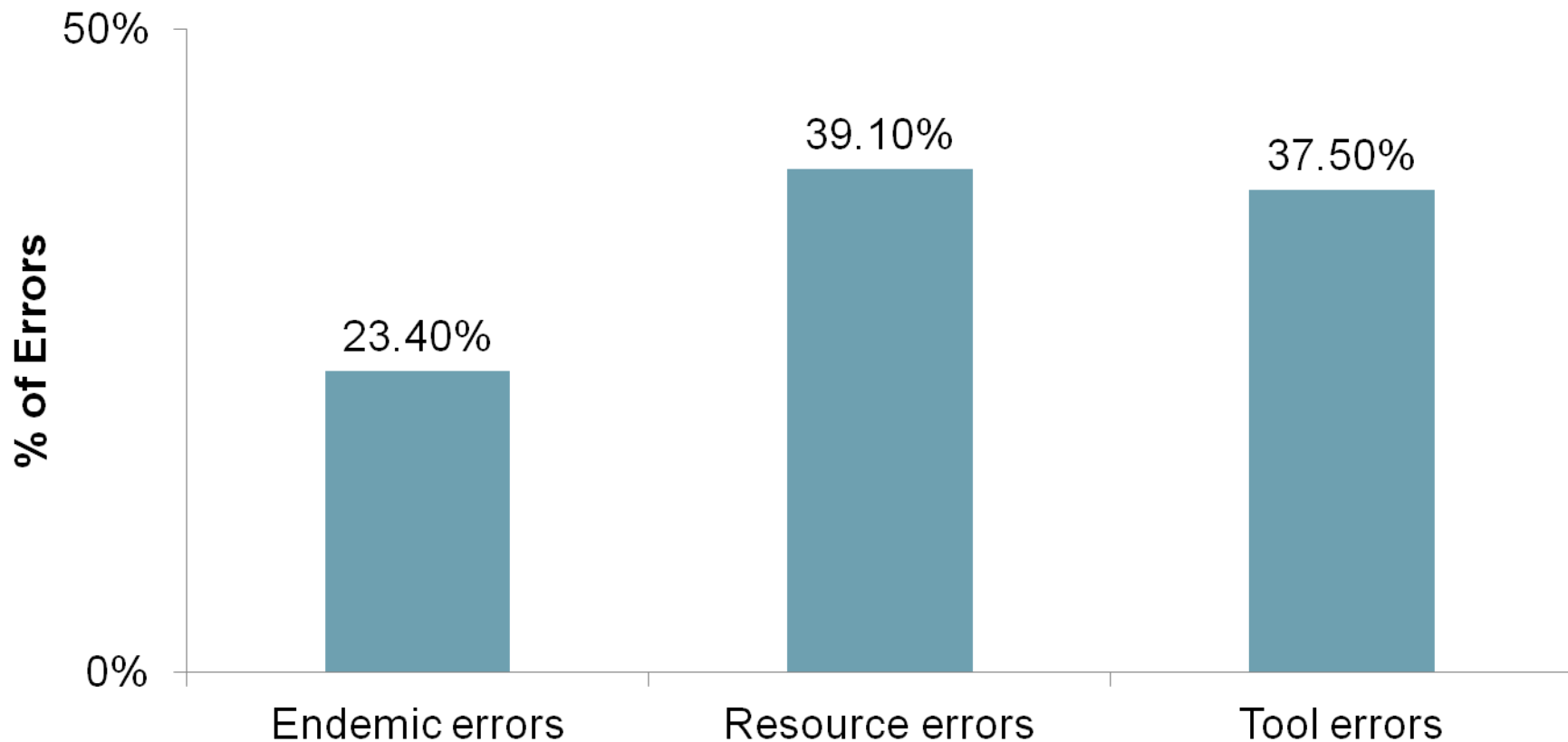


Initial results suggested the technique was unusable.



Error analysis revealed that <24% of errors were endemic to the technique.

Sources of DAVID errors on 90 randomly selected sentences (total errors: 32)



To explore the algorithm's viability, we hand-corrected some resources/parses.



SEEK:
AGENT [+ANIMATE]



SEEK:
AGENT [+ANIMATE
| +ORGANIZATION]

20 VerbNet classes updated

SemLink

KEEP.04 → SUSTAIN-55.6



KEEP.04 → KEEP-15.2

20 SemLink entries updated

SENNA

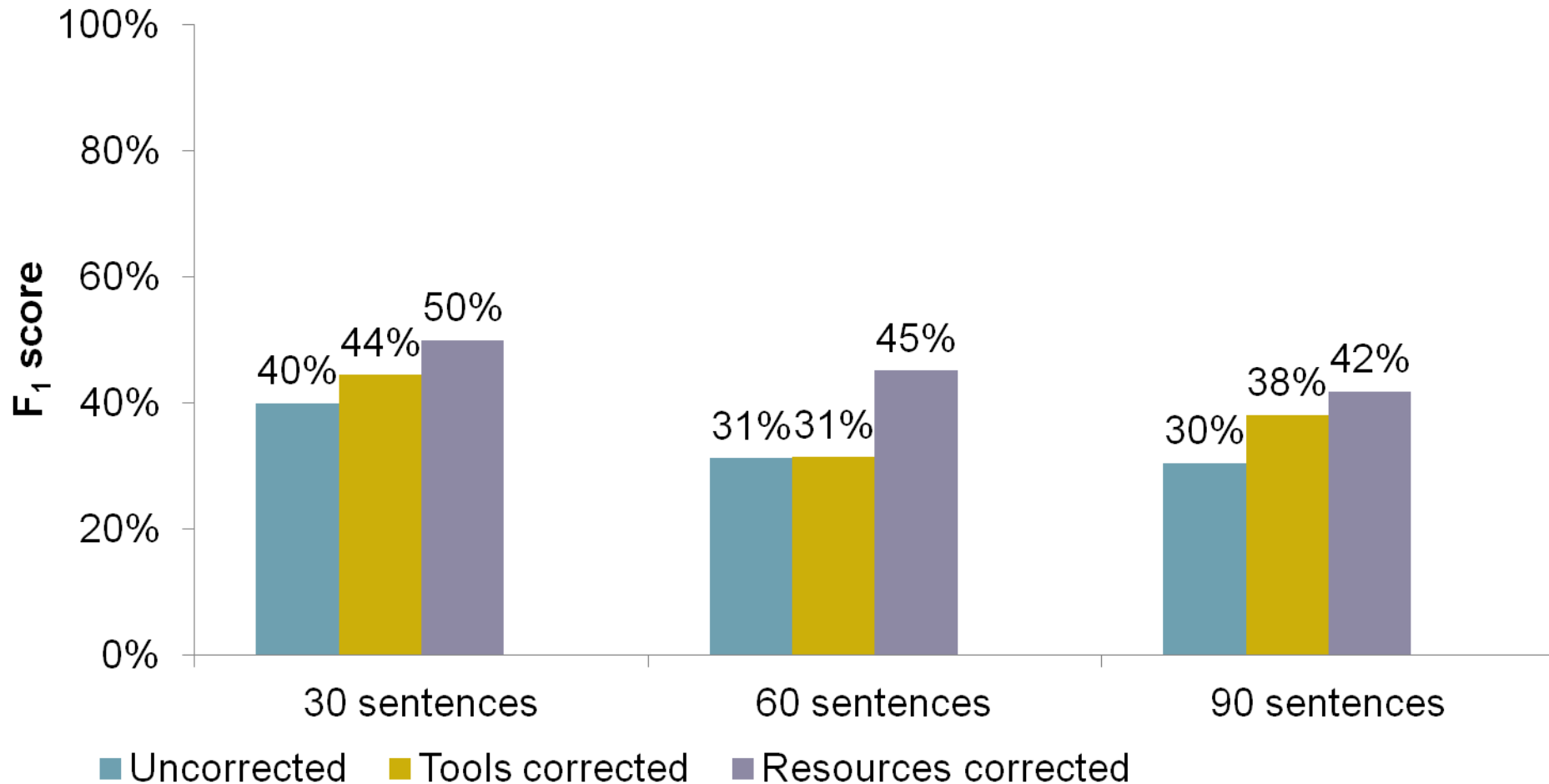
It's named after Mr. Scott's father.
ARG1 V ARGM-TMP



It's named after Mr. Scott's father.
ARG1 V ARG2

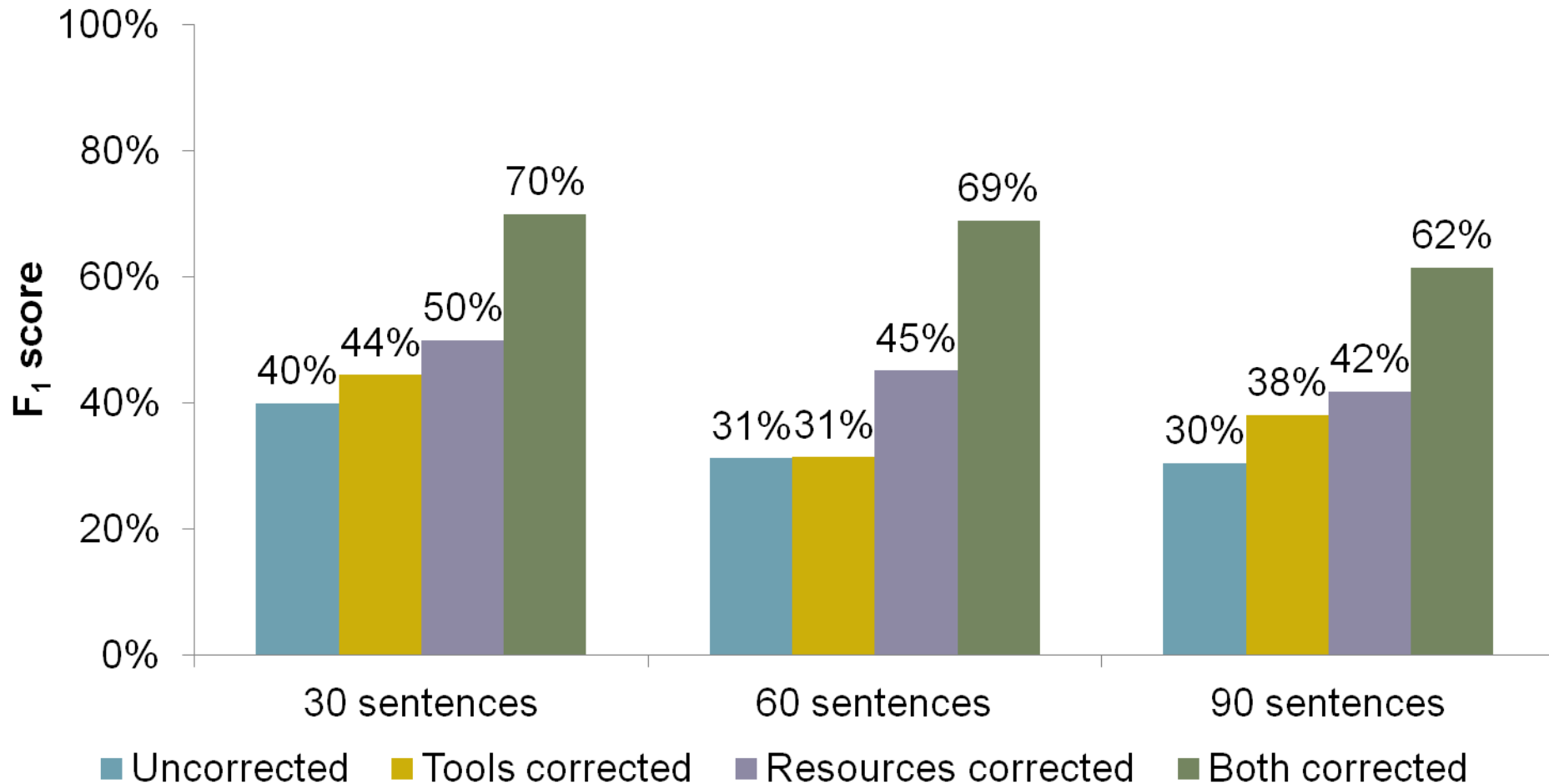
Results: resource improvements > tool improvements.

DAVID performance with various degrees of correction



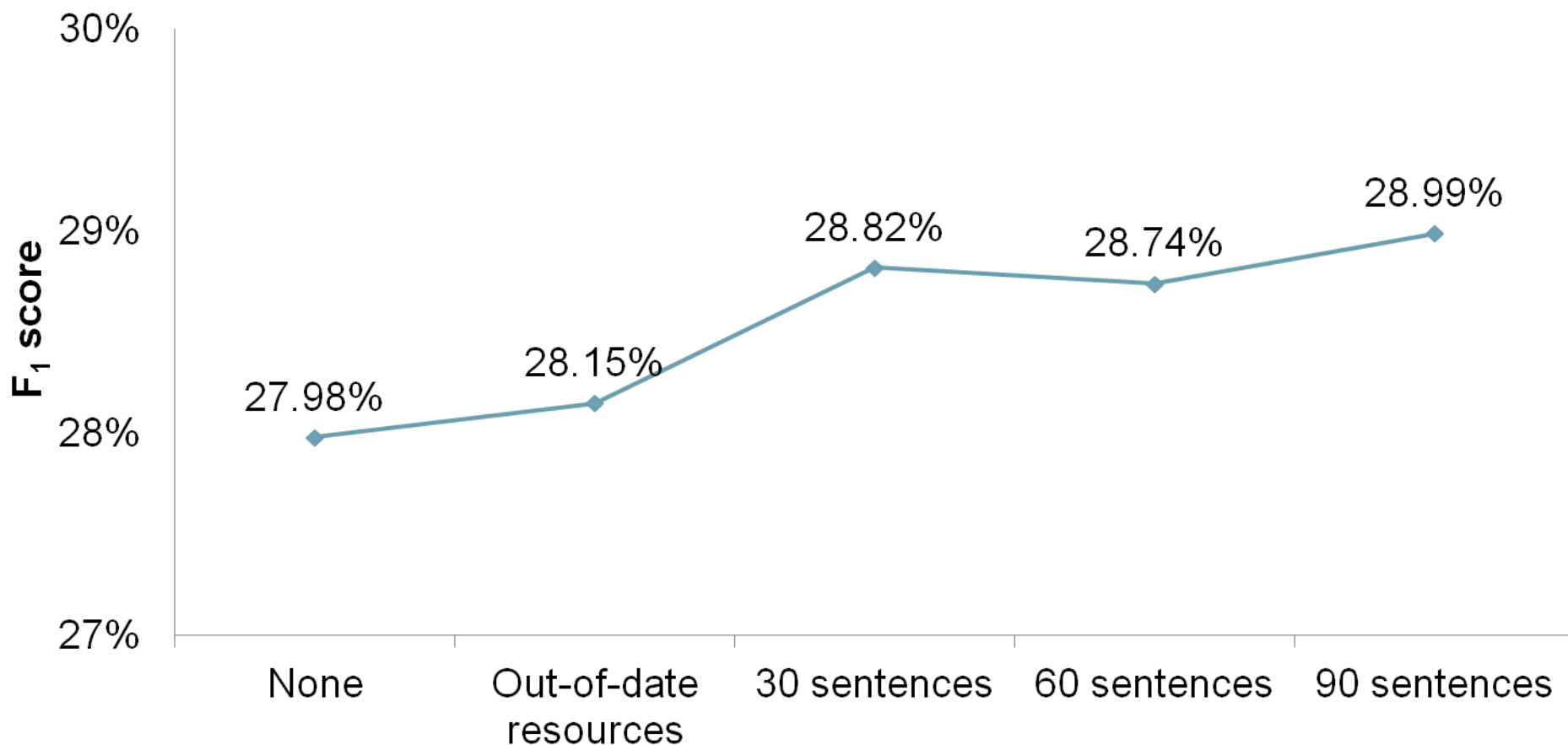
Results: resource improvements & tool improvements add superlinearly.

DAVID performance with various degrees of correction



Our resource improvements generalize to novel sentences.

DAVID performance on 625 uncorrected sentences with various degrees of correction



NLP tools demand heavy investment in resource quality.

We have demonstrated that:

- Preference violations can be detected with lexical resources
- Resource quality can matter more than tool performance
- Resource and tool improvements add synergistically