

Uptraining for Accurate Deterministic Question Parsing



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Let's build a Question Answering System

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- Need a parser

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- Model: Deterministic Shift-Reduce Parser (Nivre et al.)

Let's build a Question Answering System

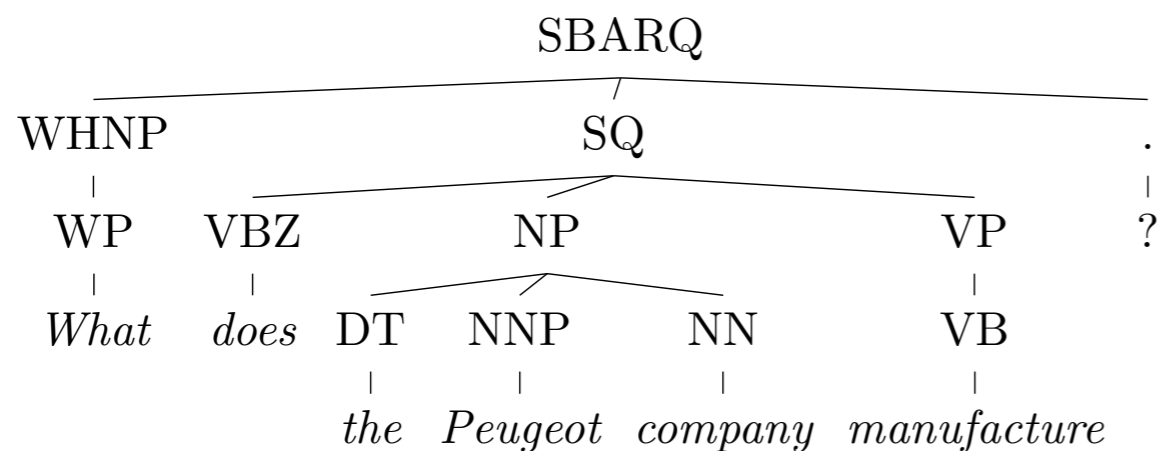
fast

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- Train on Wall Street Journal section of Penn Treebank

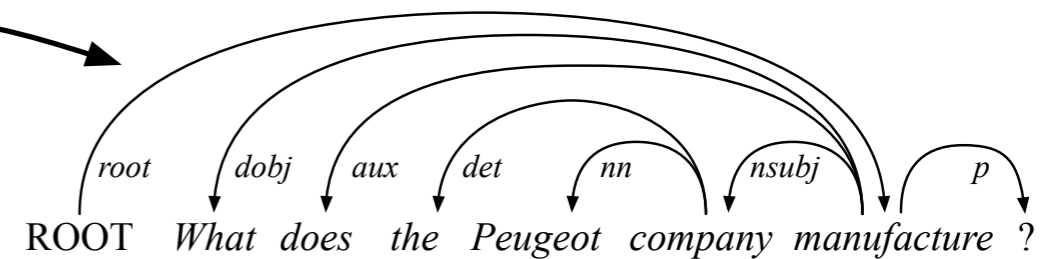
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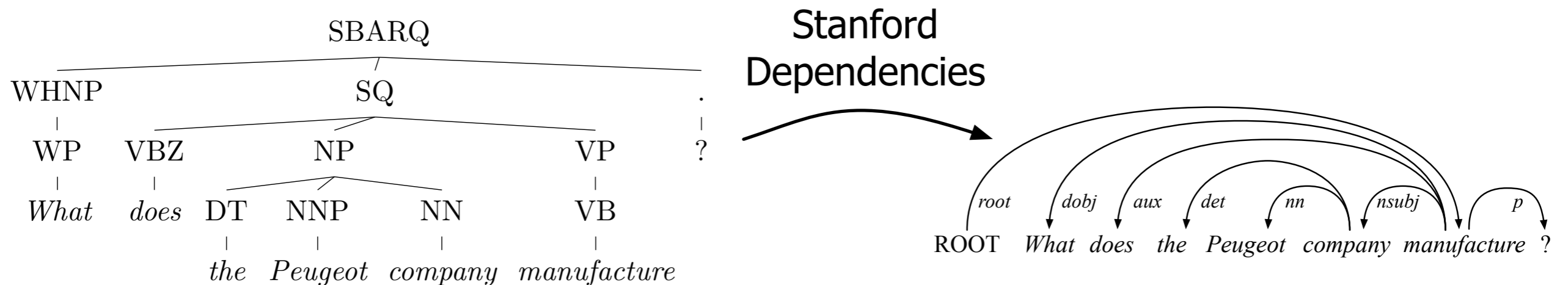
Stanford
Dependencies



Let's build a Question Answering System

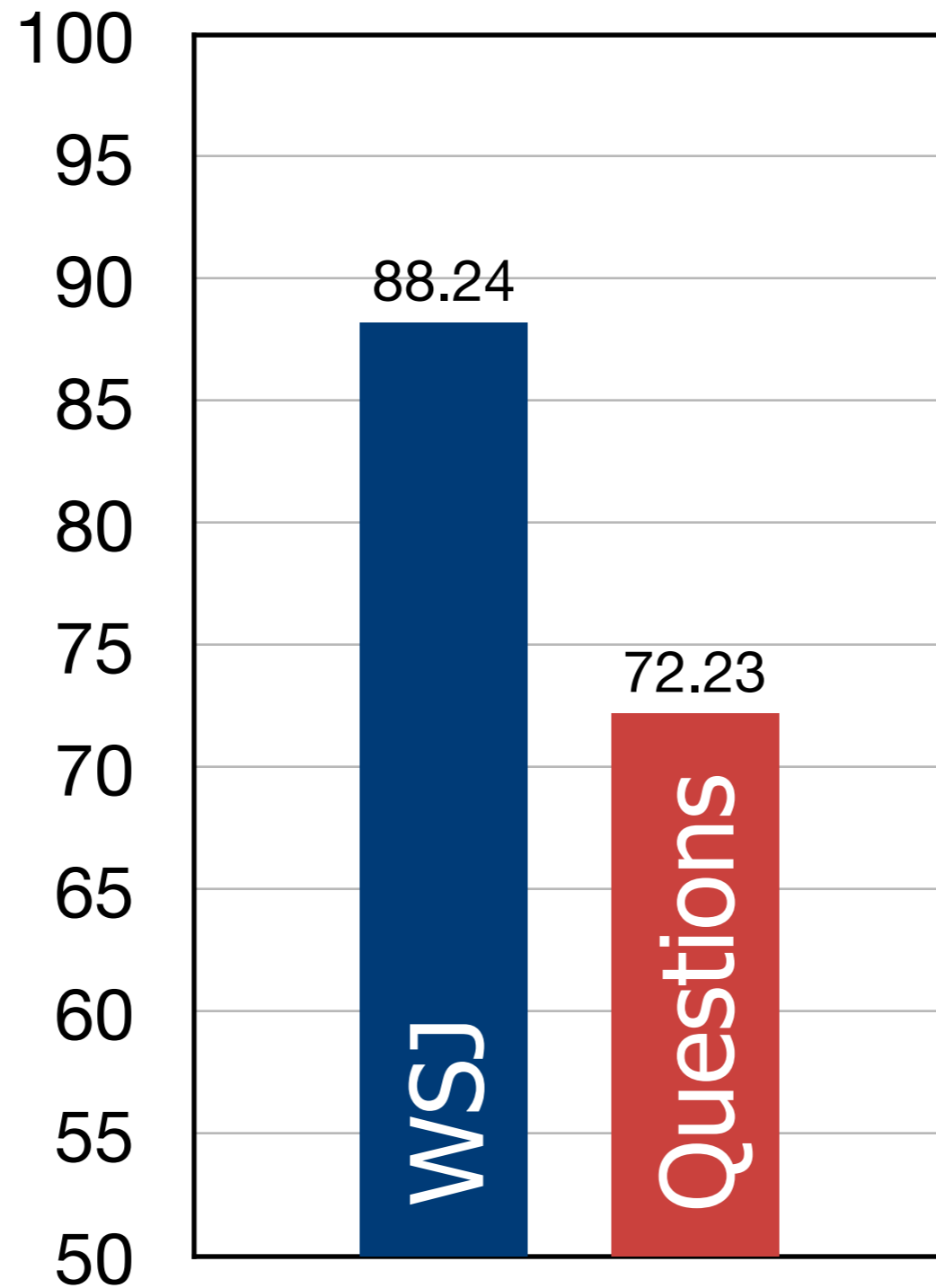
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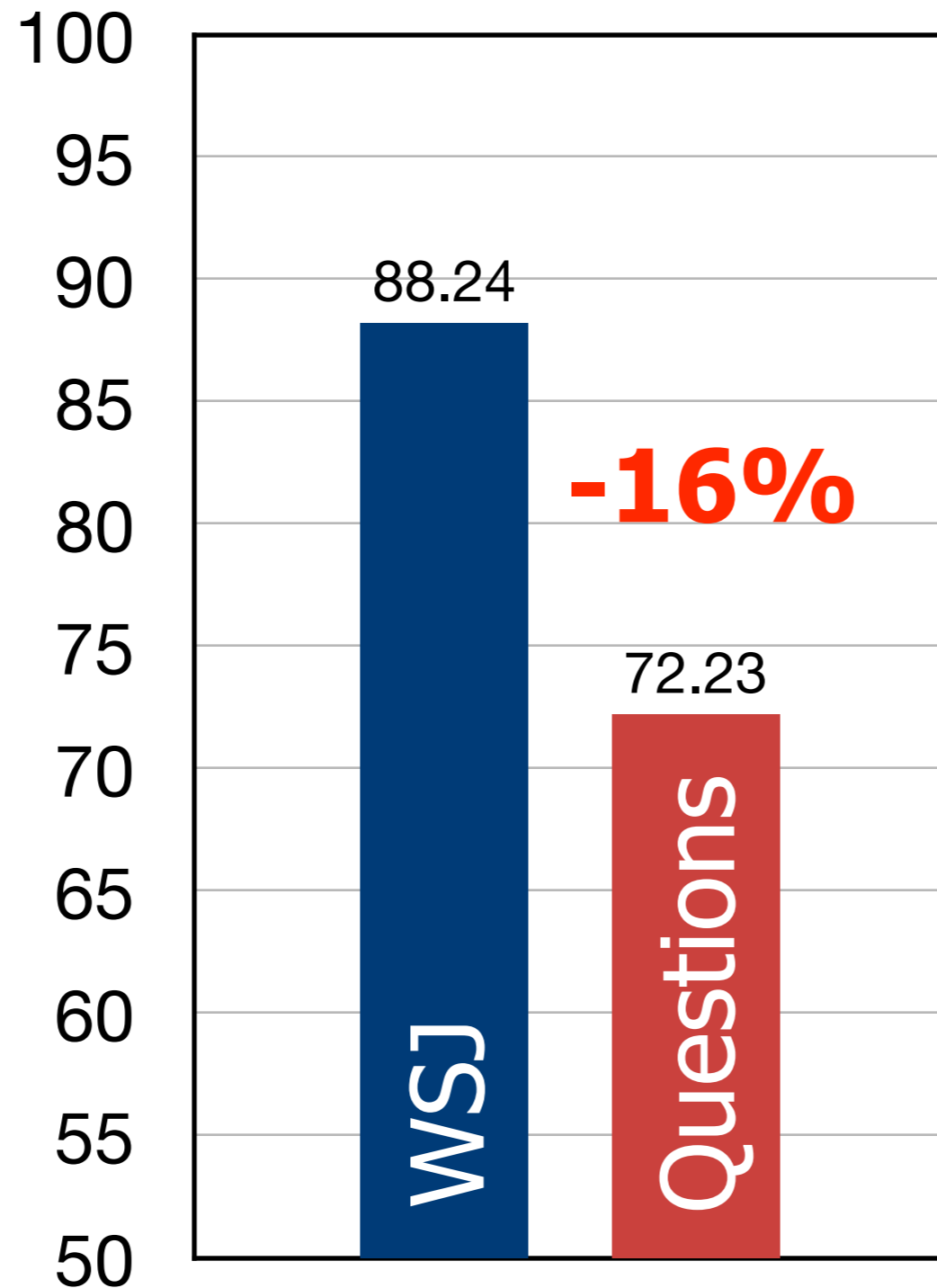


- **Test on QuestionBank (Judge et al. '06)**

Unlabeled Attachment Score



Unlabeled Attachment Score

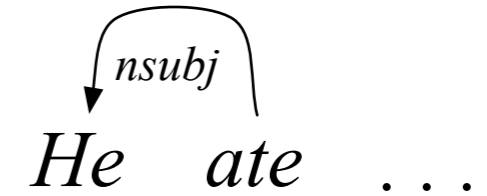


What happened?

INPUT:		
<i>He ate the green apple .</i>		
STACK: <table border="1"><tr><td><i>green</i></td></tr><tr><td><i>the</i></td></tr></table> ↑	<i>green</i>	<i>the</i>
<i>green</i>		
<i>the</i>		

OUTPUT:

He ate ...



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<i>green</i>		
<i>the</i>		

OUTPUT:

He ate ...
↑ *nsubj* ↓

- Single left-to-right pass

What happened?

OUTPUT:

INPUT:
<i>What did John eat yesterday ?</i>

- Single left-to-right pass

What happened?

OUTPUT:

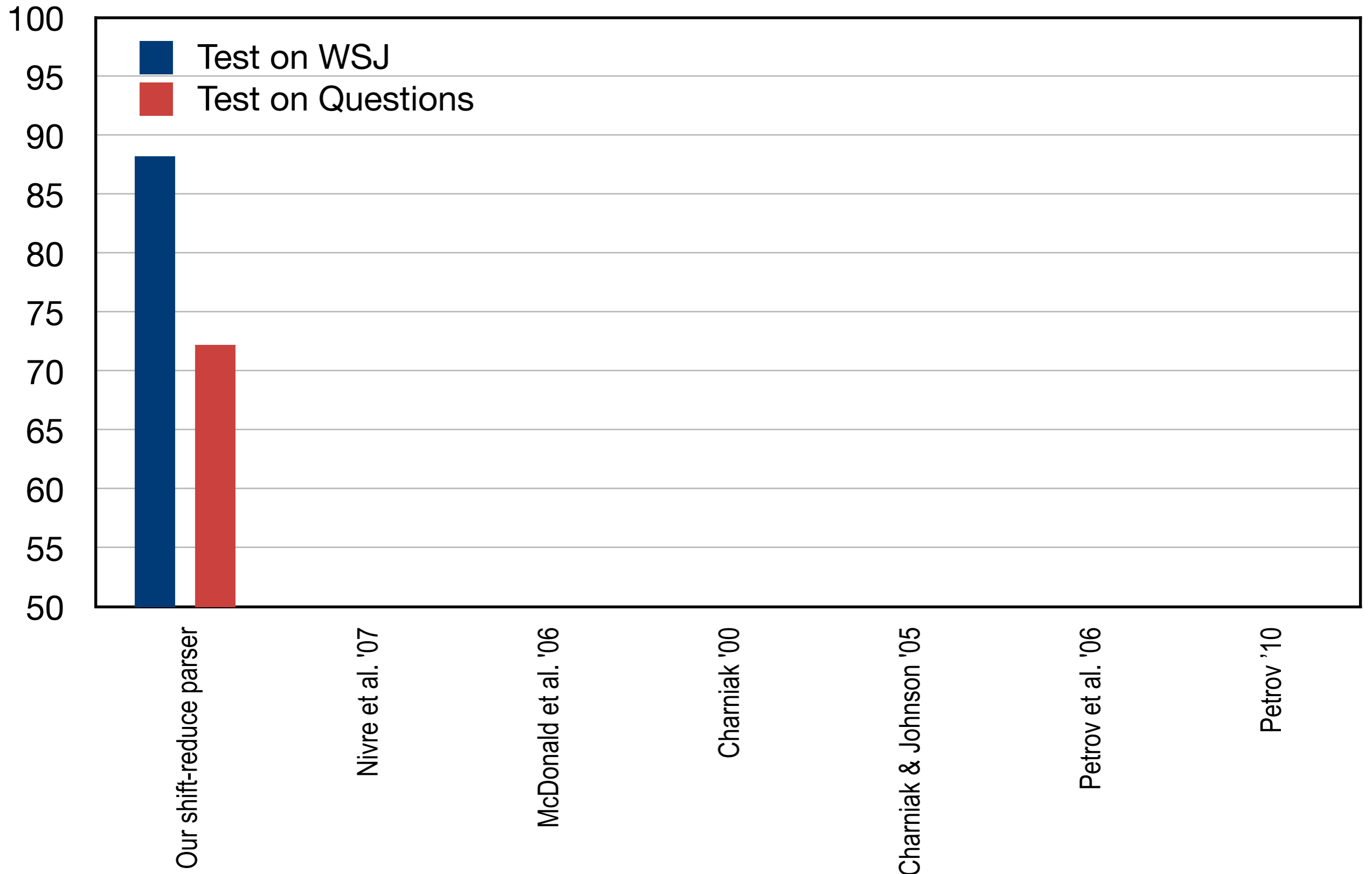
INPUT:
<i>What did John eat yesterday ?</i>

- Single left-to-right pass
- Only 334 questions in the training set (out of 39,832)

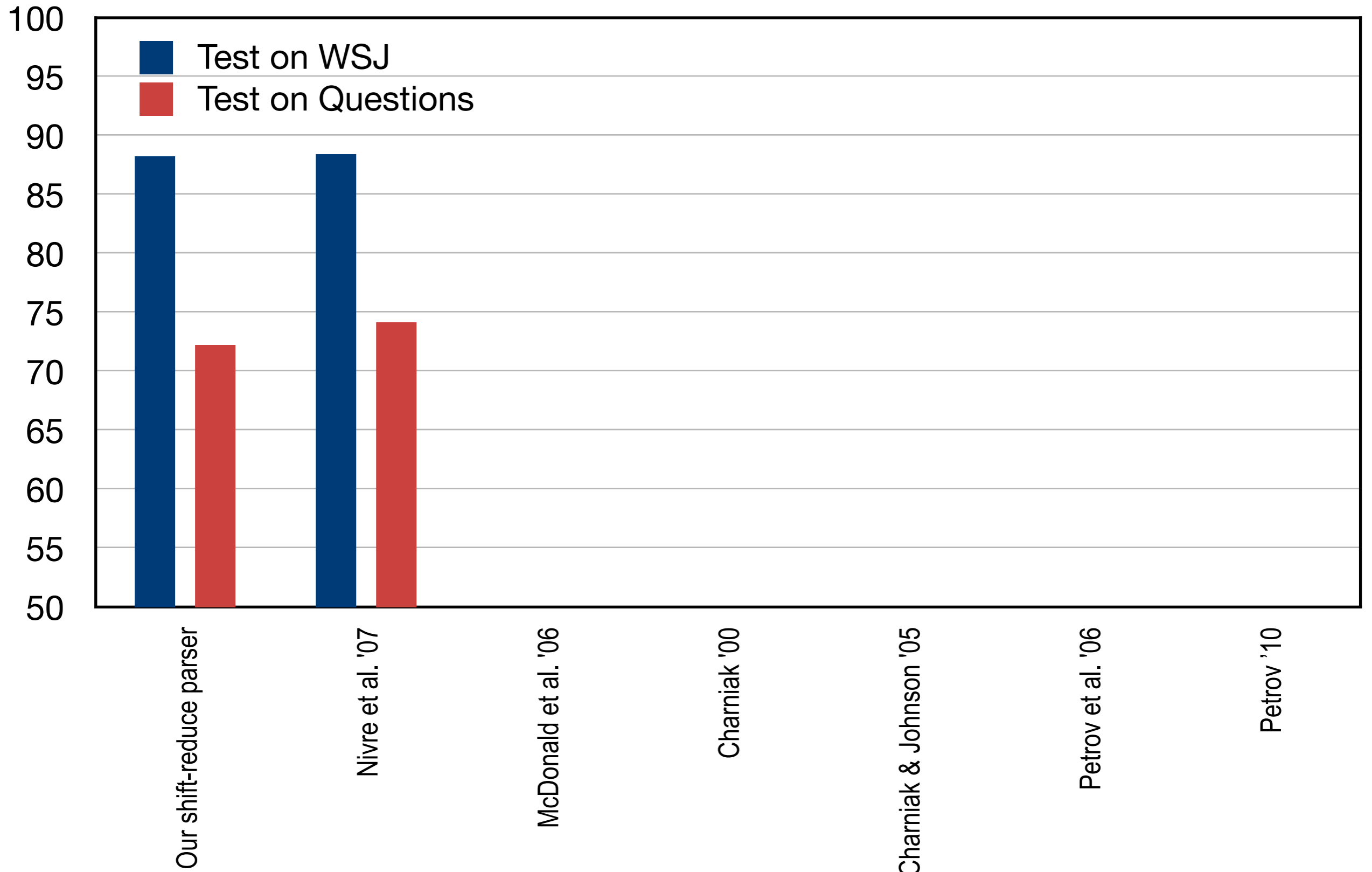
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- Test on WSJ
- Test on Questions

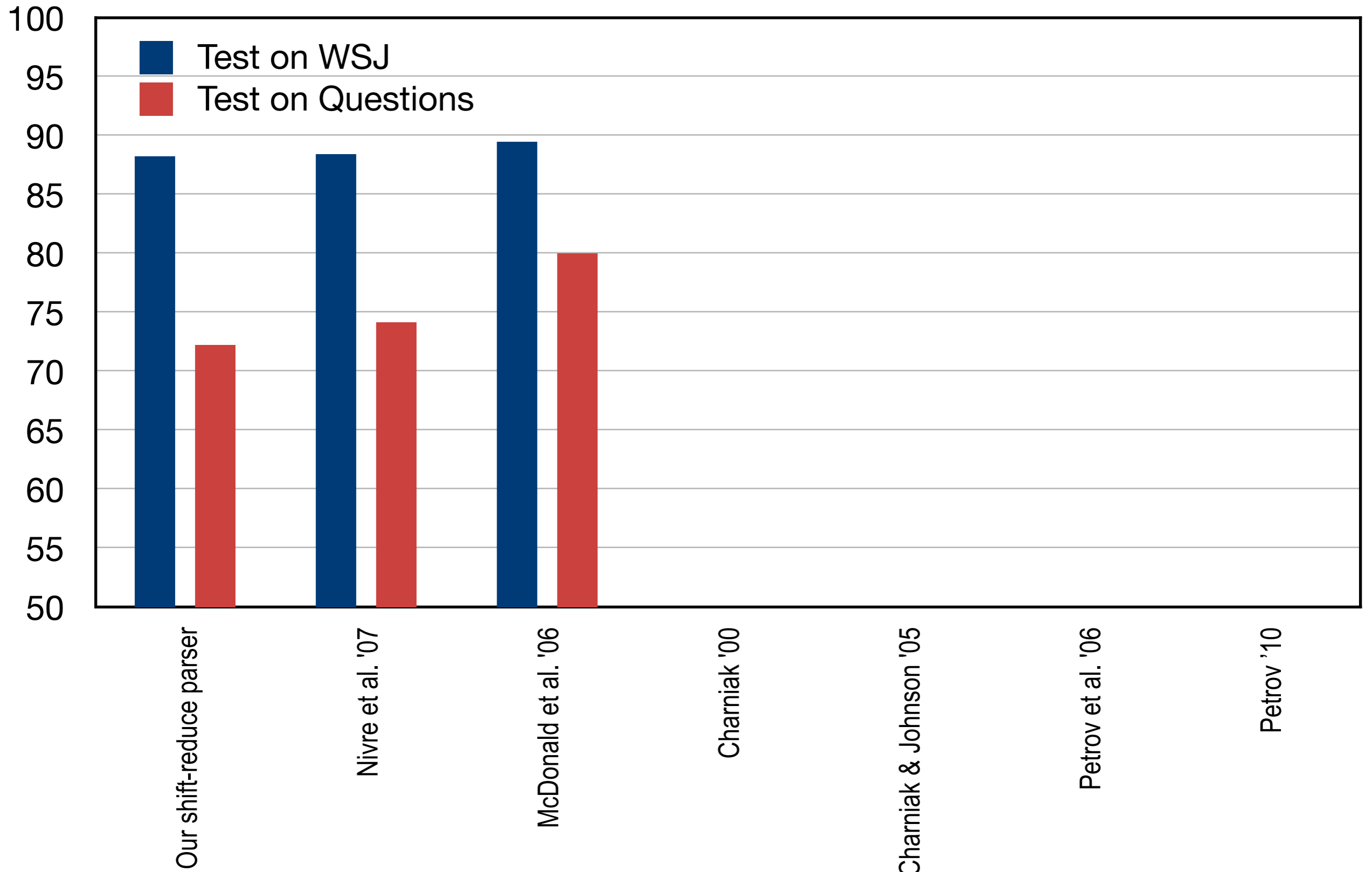
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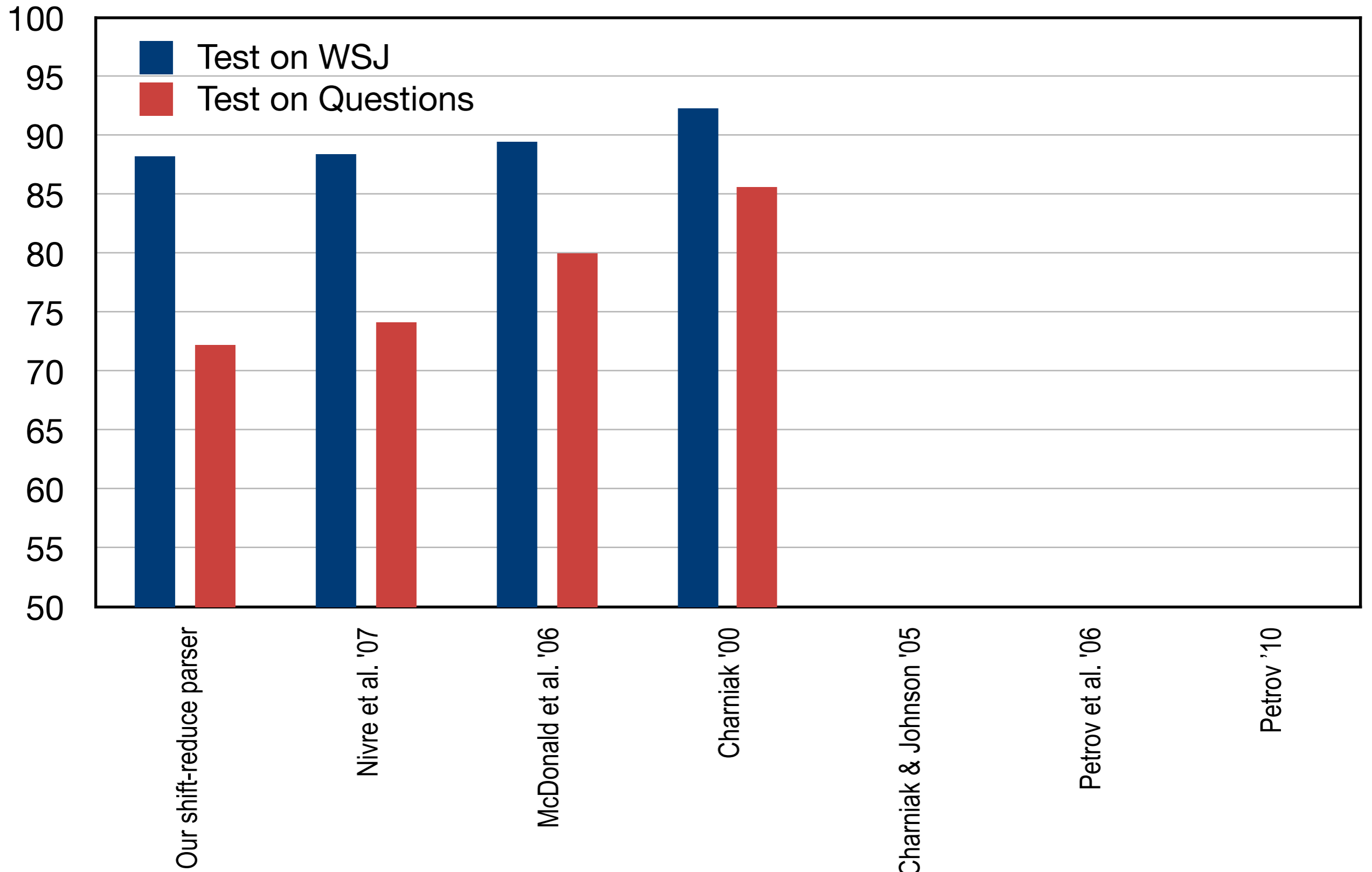
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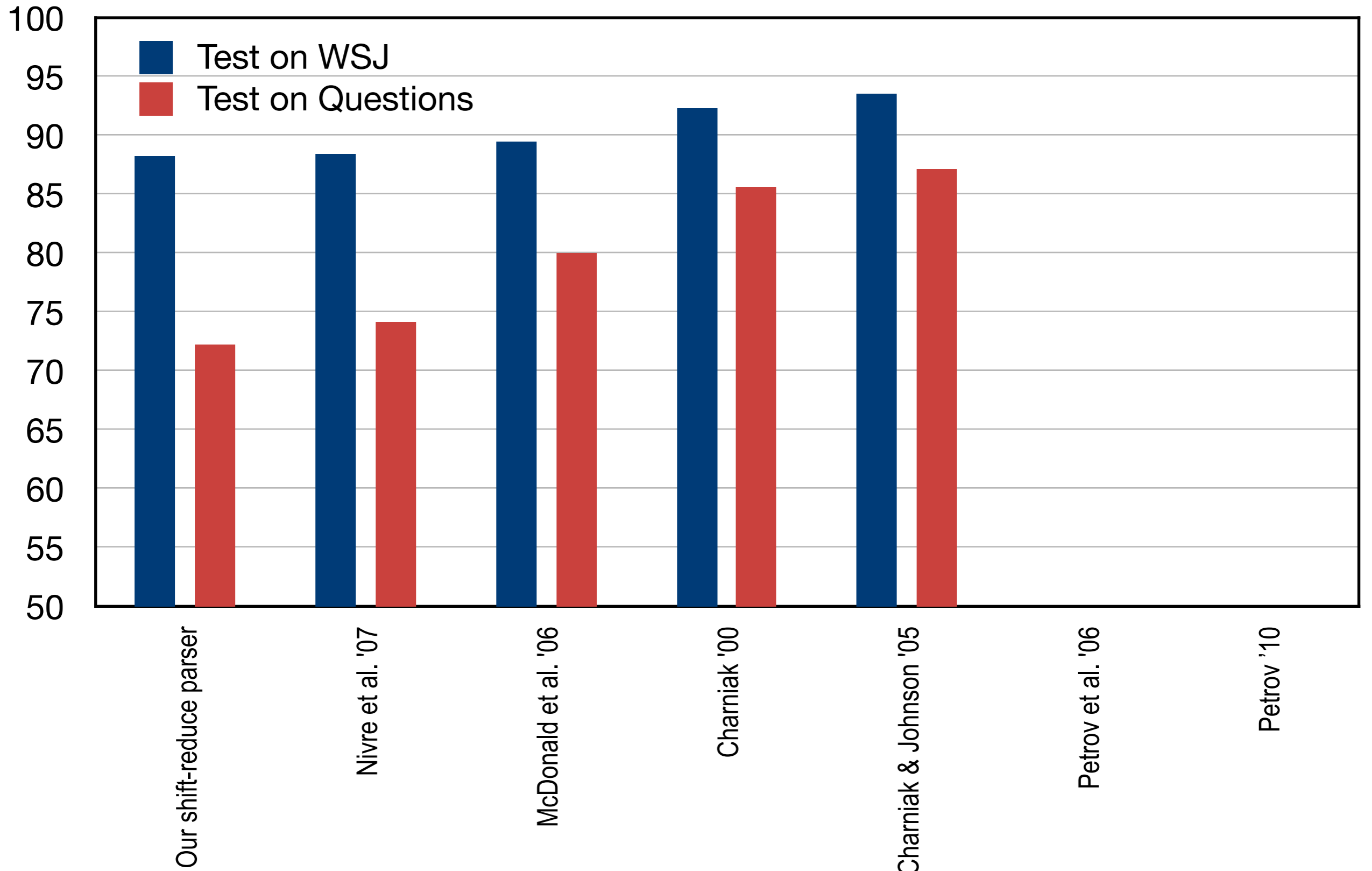
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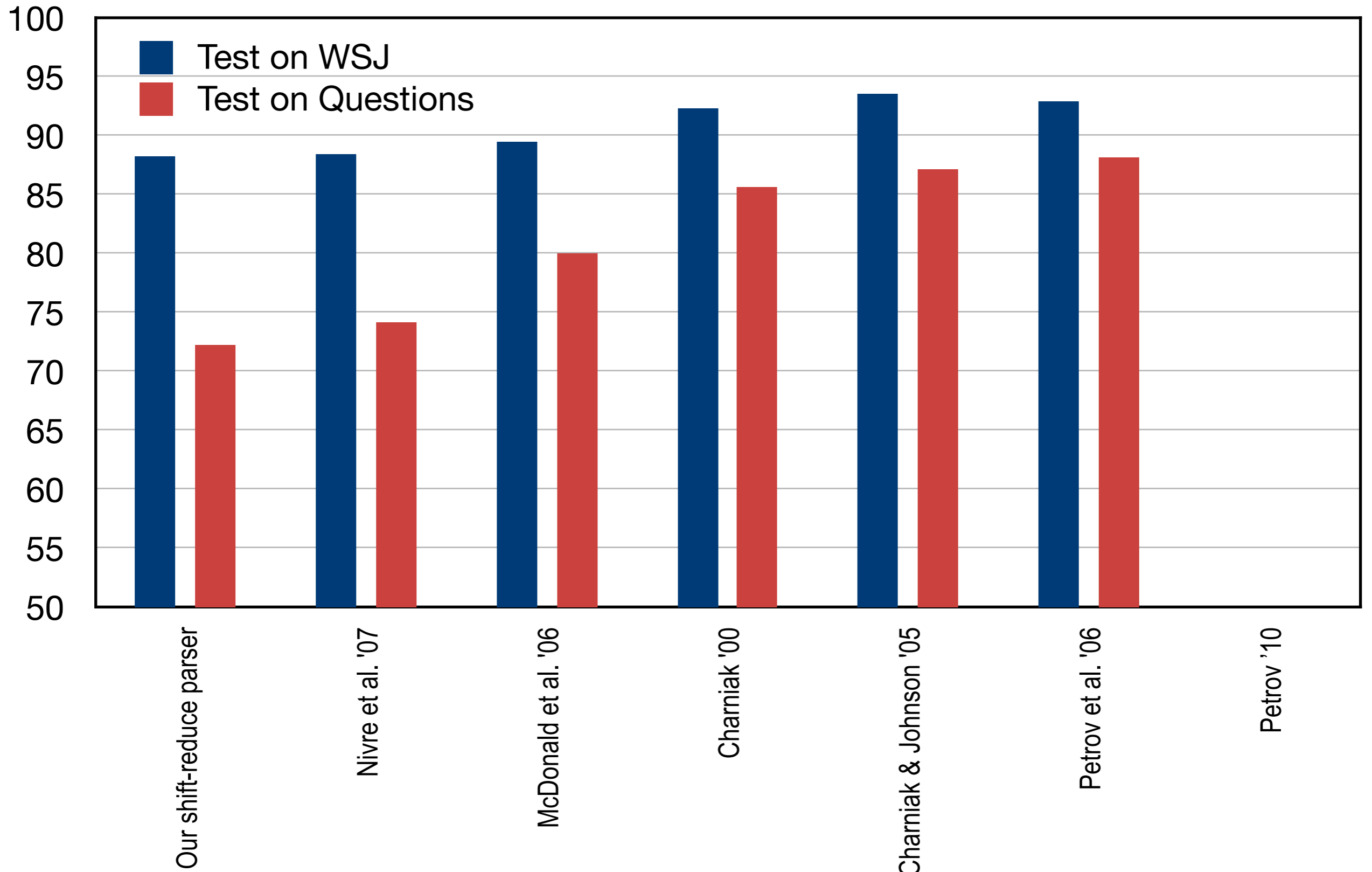
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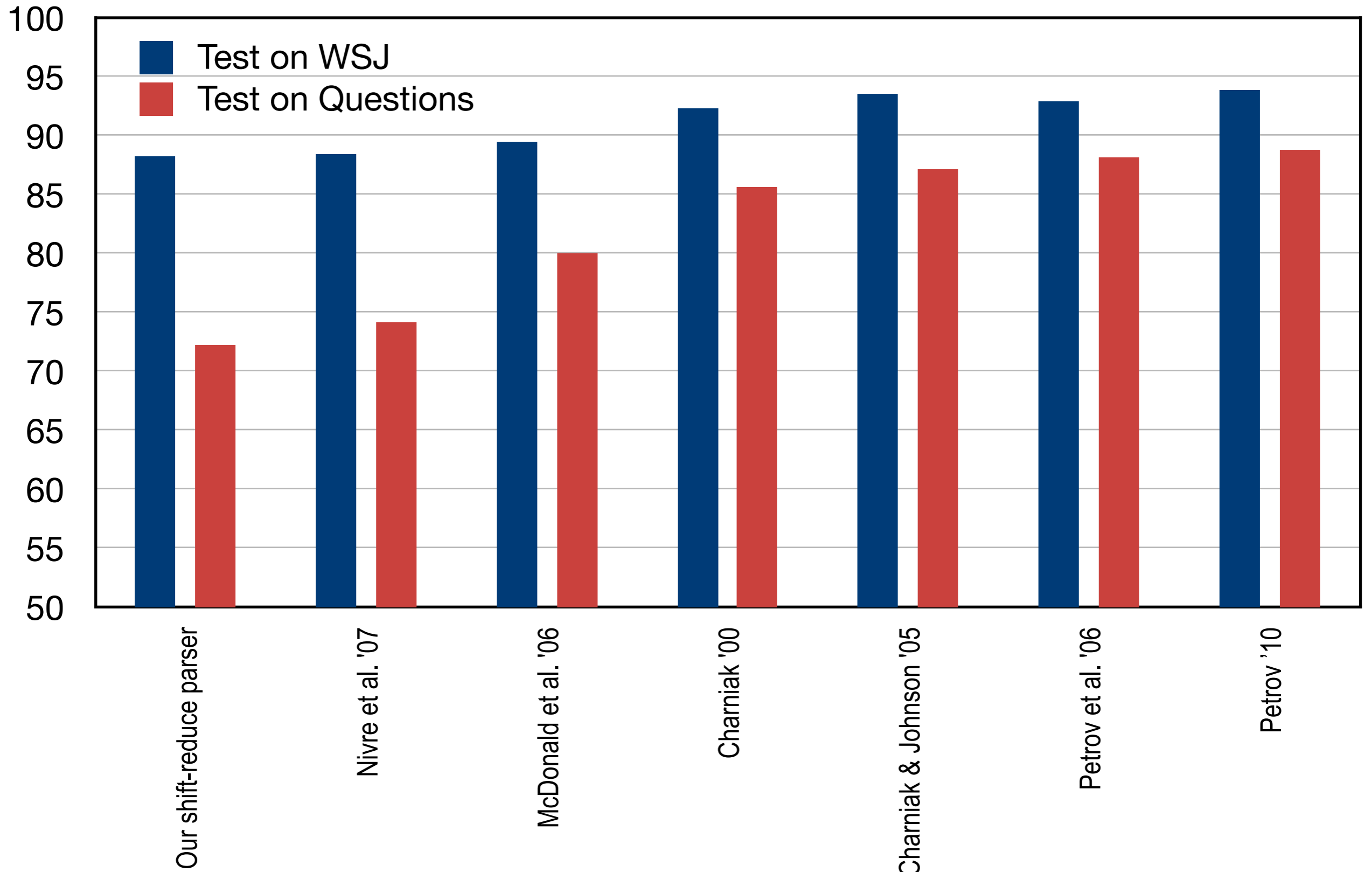
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Uptraining

- Latent Variable Parser
 - **generalizes best**
 - **too slow for our needs**

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- Idea: Parse lots of unlabeled questions with Latent Variable Parser and use as (noisy) training data for shift-reduce parser.

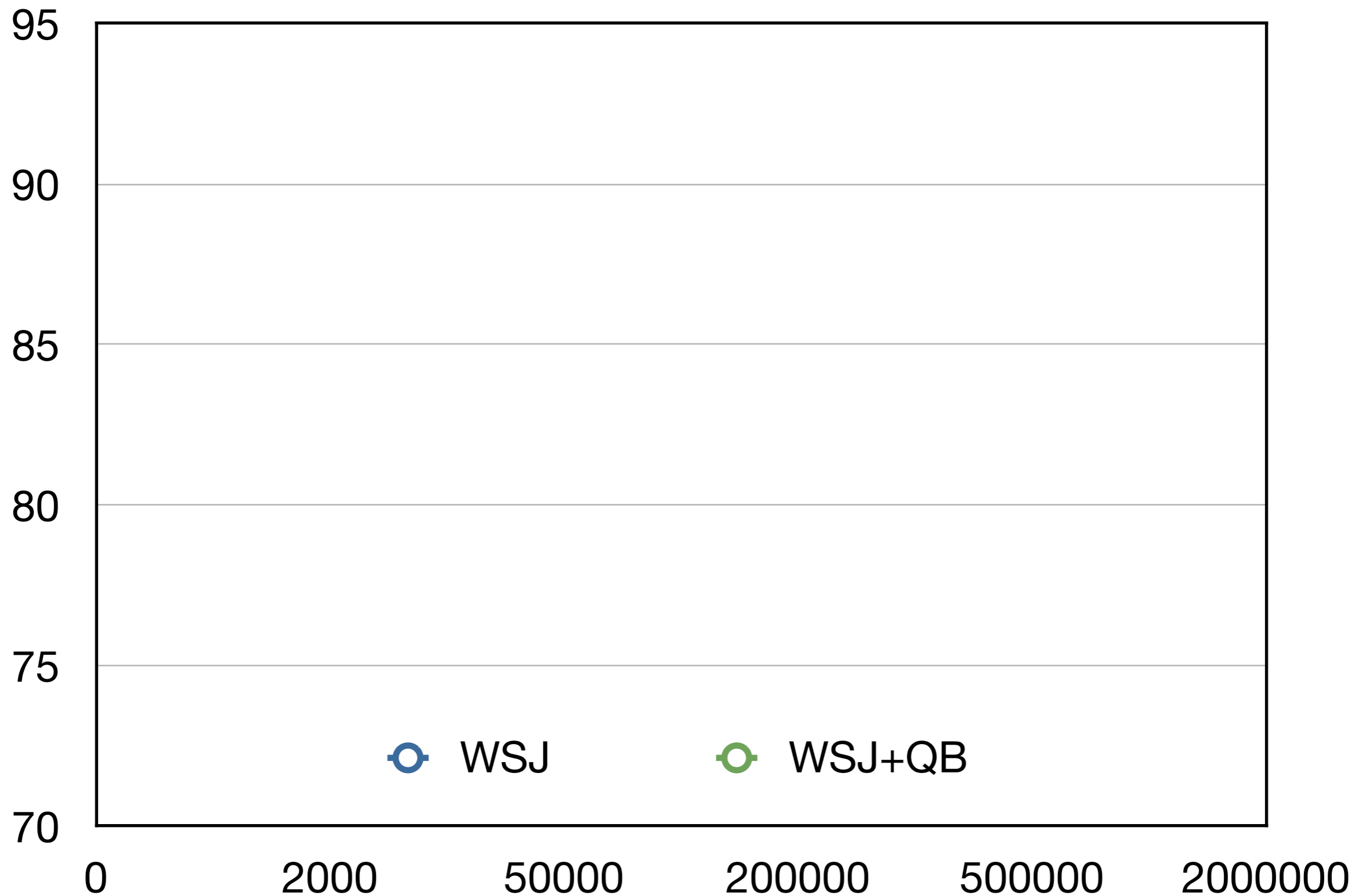
Uptraining Results on Questions



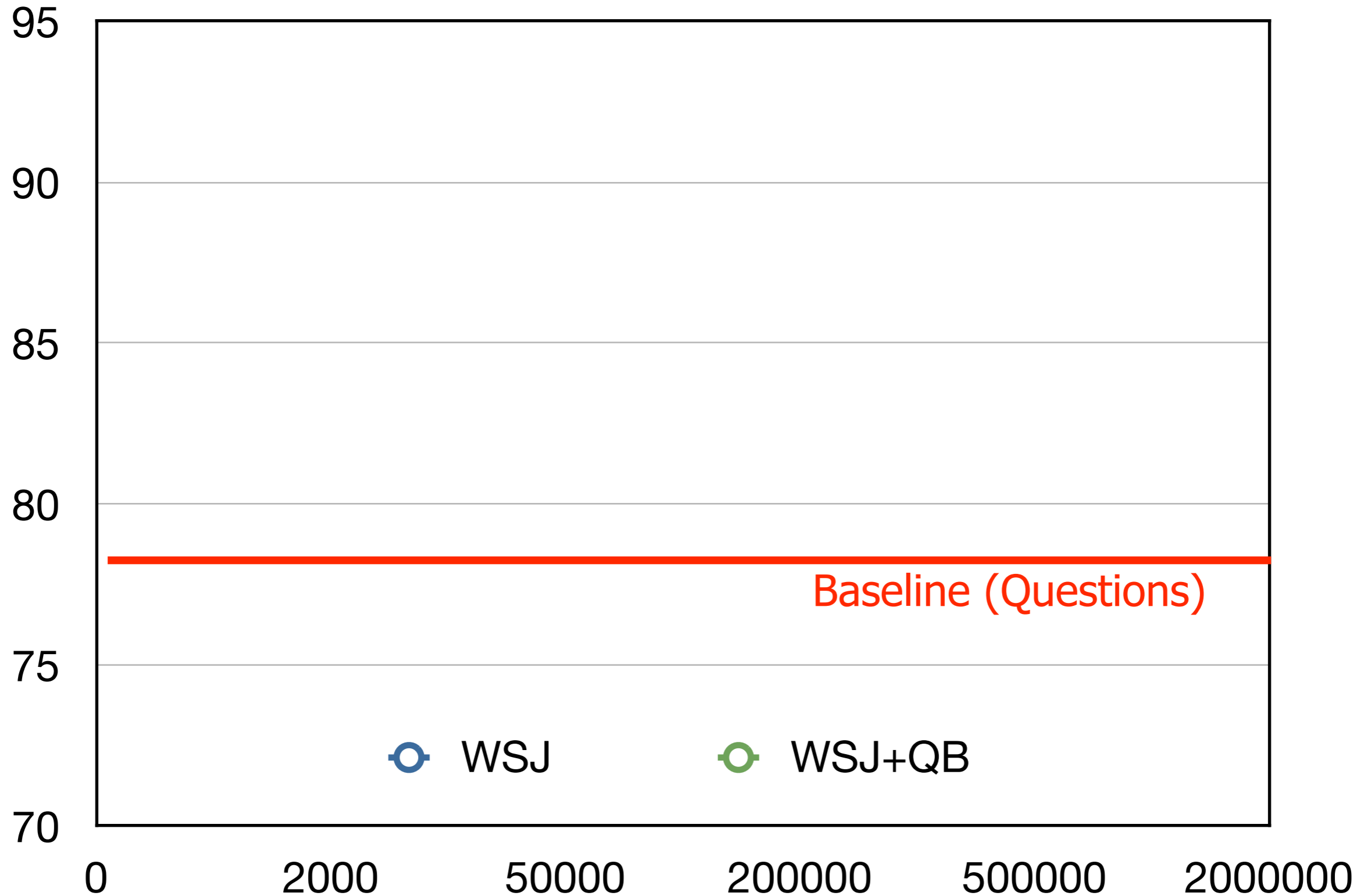
 WSJ

 WSJ+QB

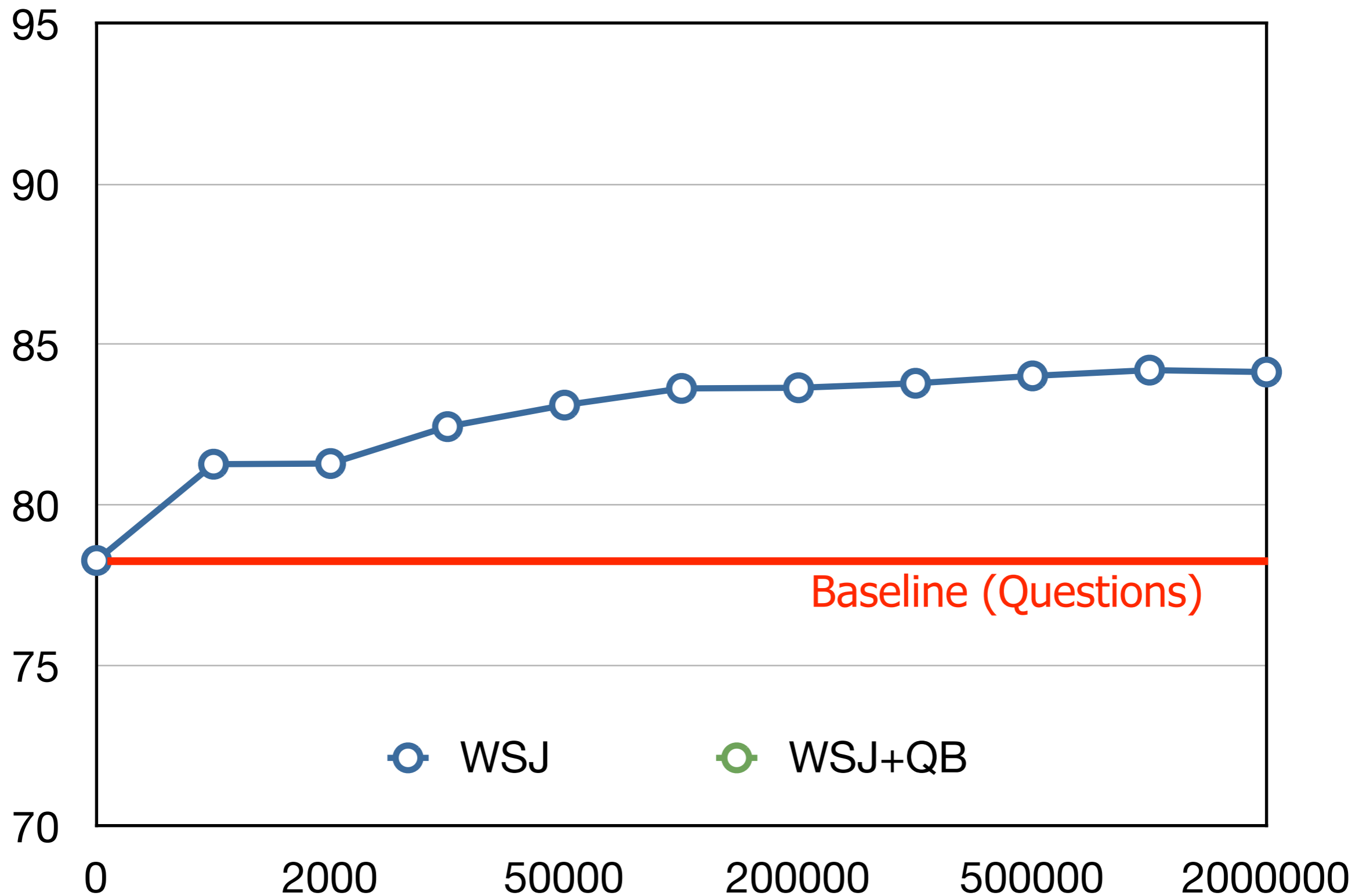
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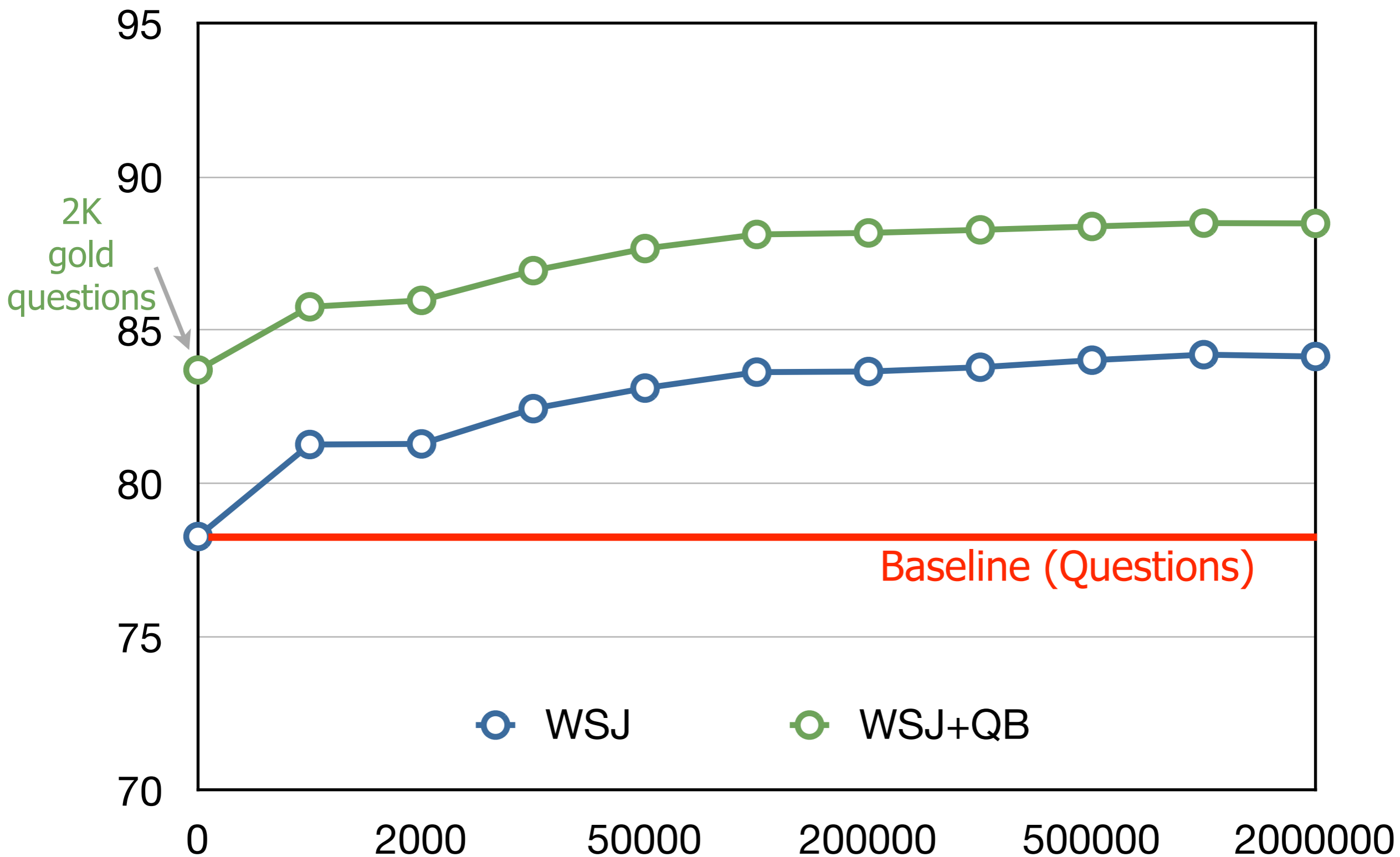
Uptraining Results on Questions



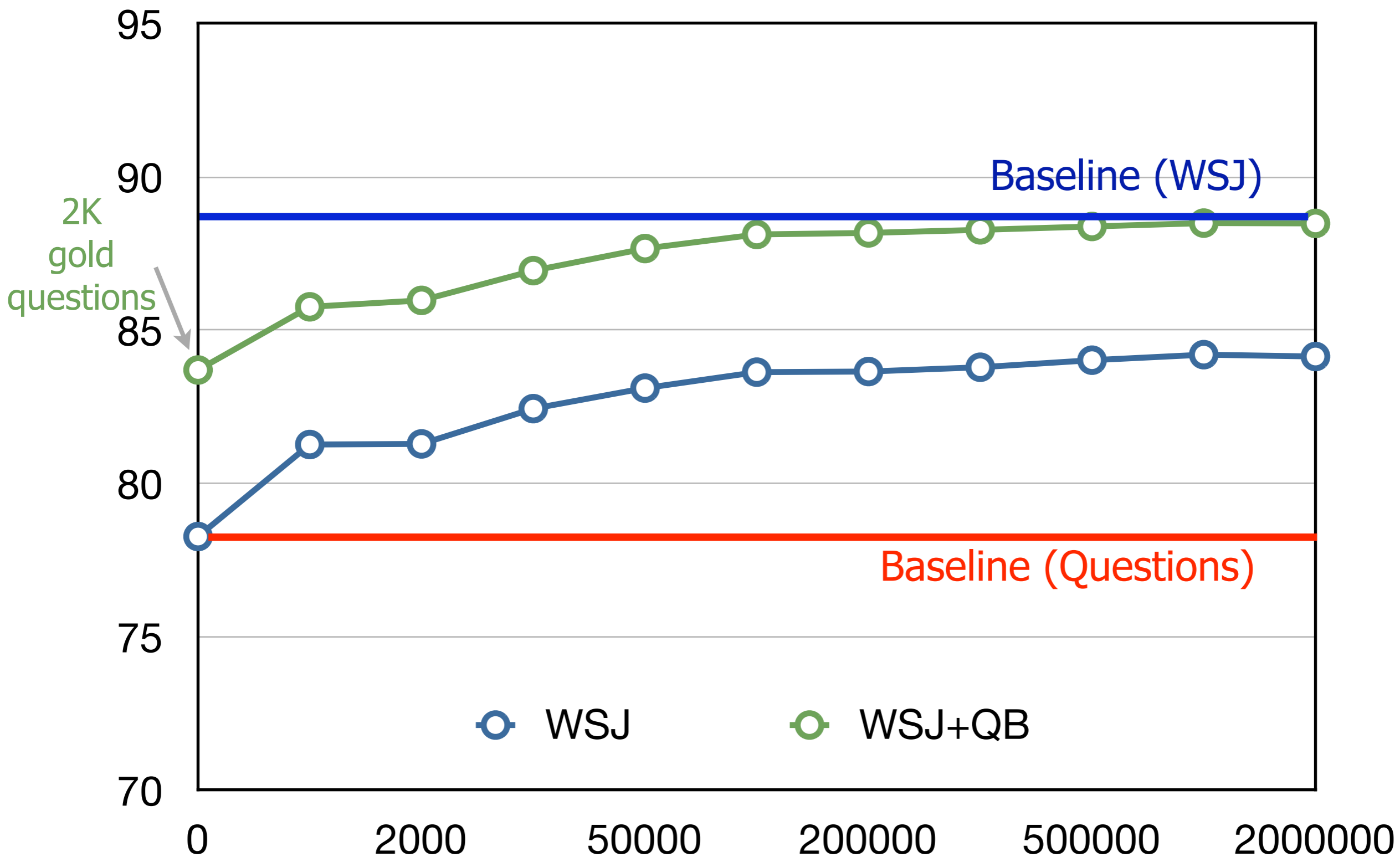
Uptraining Results on Questions



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Uptraining Results on Questions



Thank you!



Come to the poster for more details!