

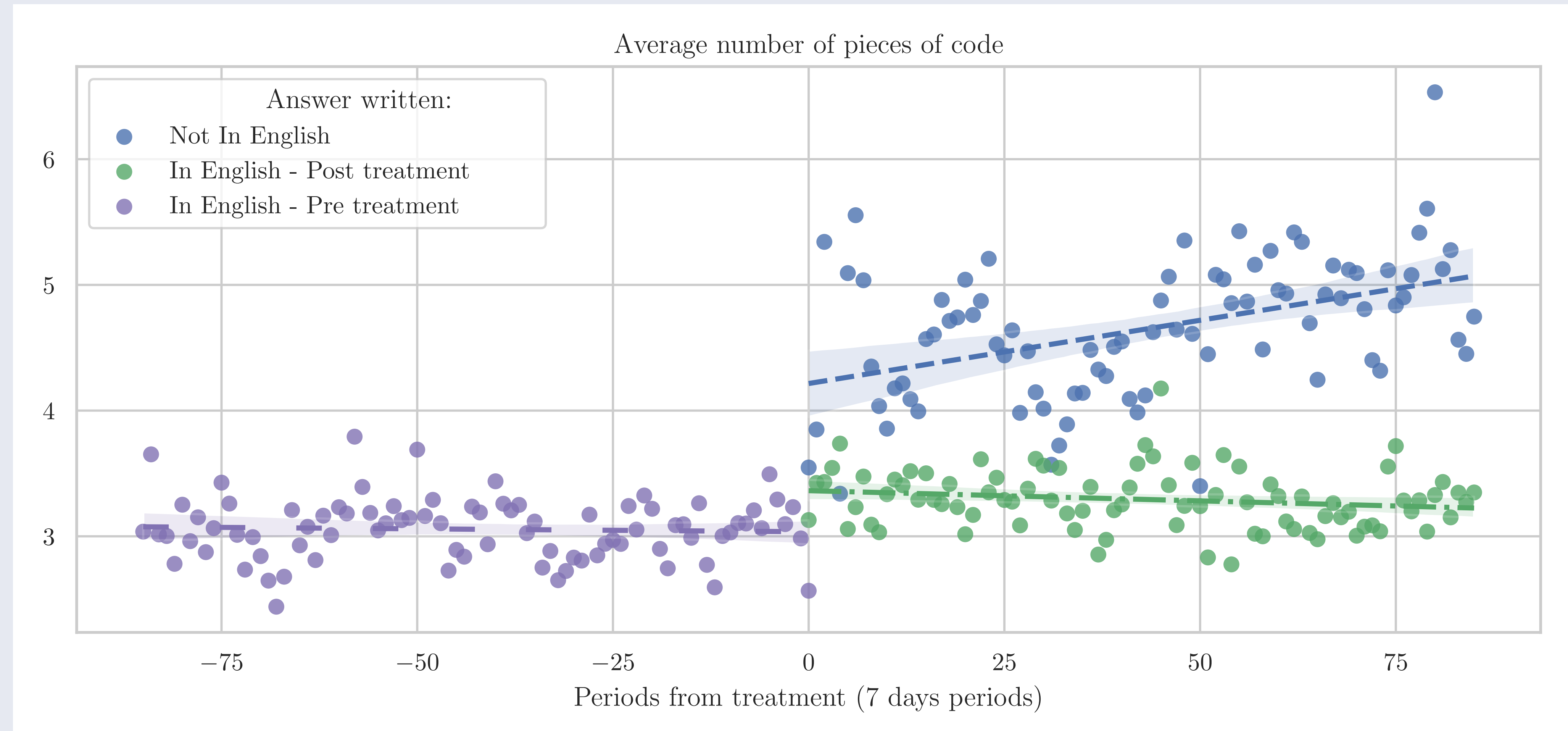
# Communication Effort and the Cost of Language: Evidence from Stack Overflow

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## A reduction in the cost of language increases communication effort

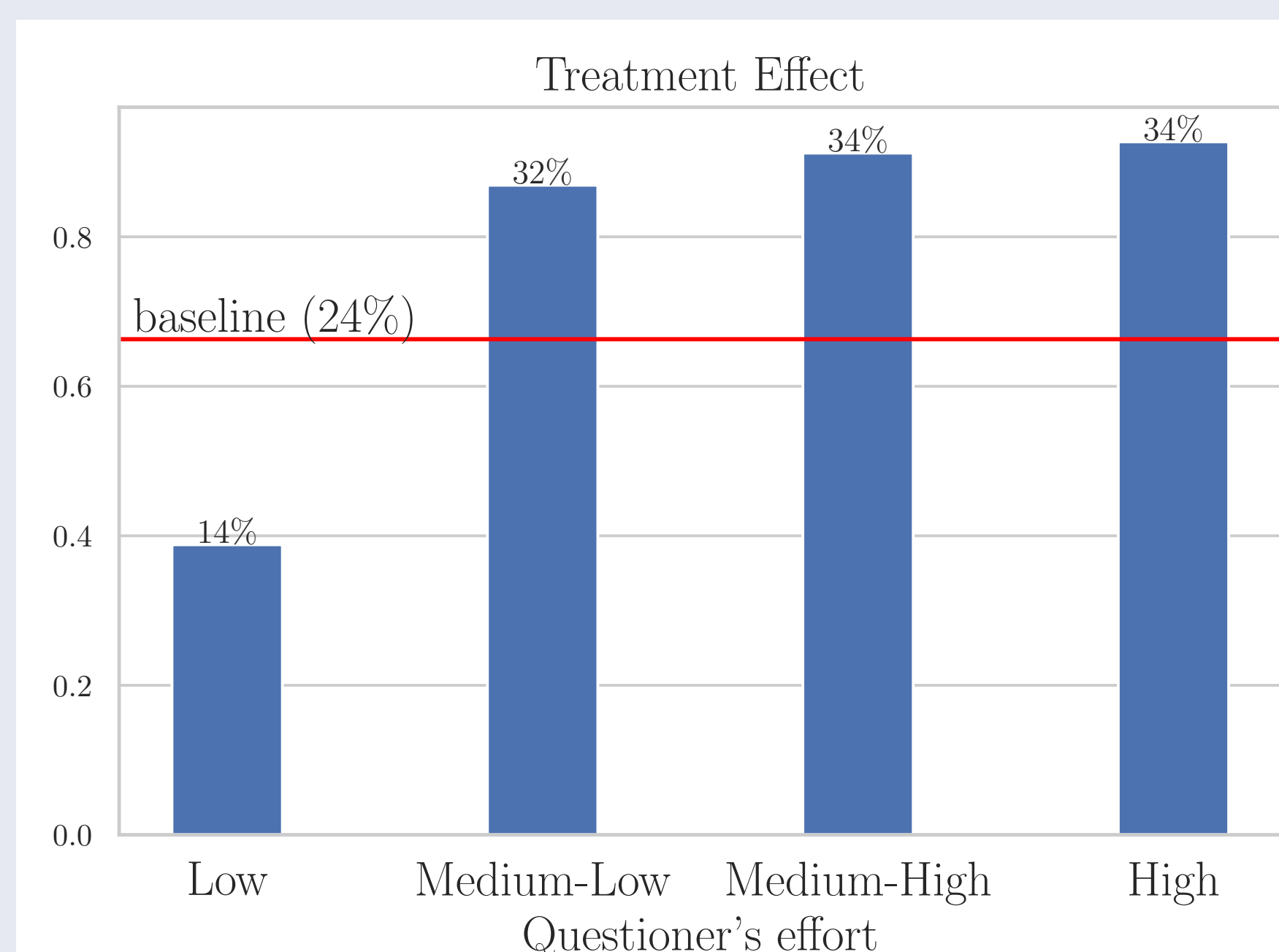
- **Setting:** Q&A platform available in English and (at some point) in other languages
- **Effort measure:** Amount of information in the answer (# pieces of code)
- **Treatment:** Non-native English speaking users are now able to write in their **native language**
- **Result:**
  - Effort increases by 24%
  - Answers are 7% more likely to solve the problem



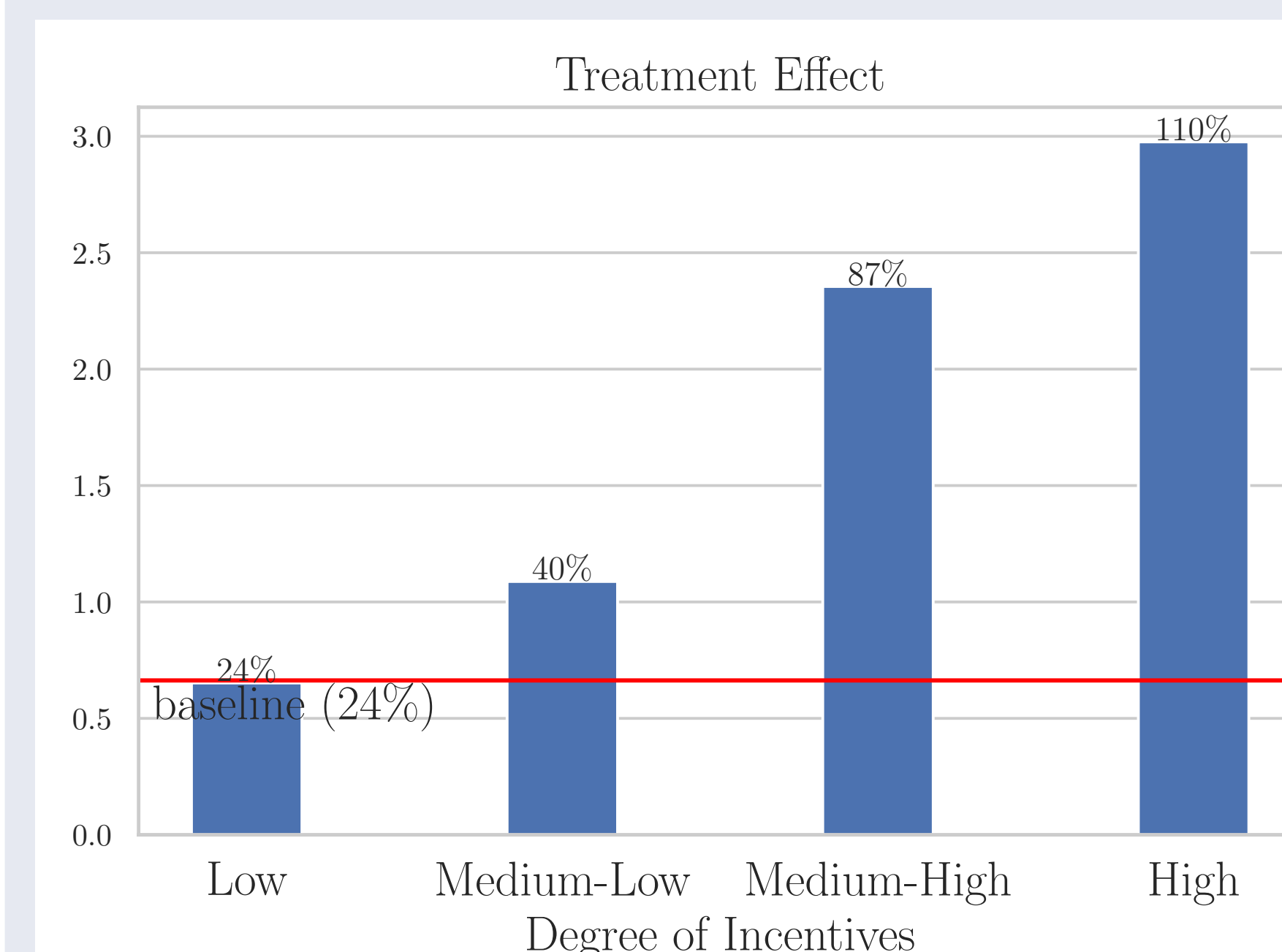
## Difference-in-Difference Estimation Strategy

- OLS with user  $\times$  week Fixed effects (Two-Way Fixed Effects) and method by Borusyak, Jaravel, Spiess (2021, WP)
- Sample of non-native English users for whom their native language became available + Control group

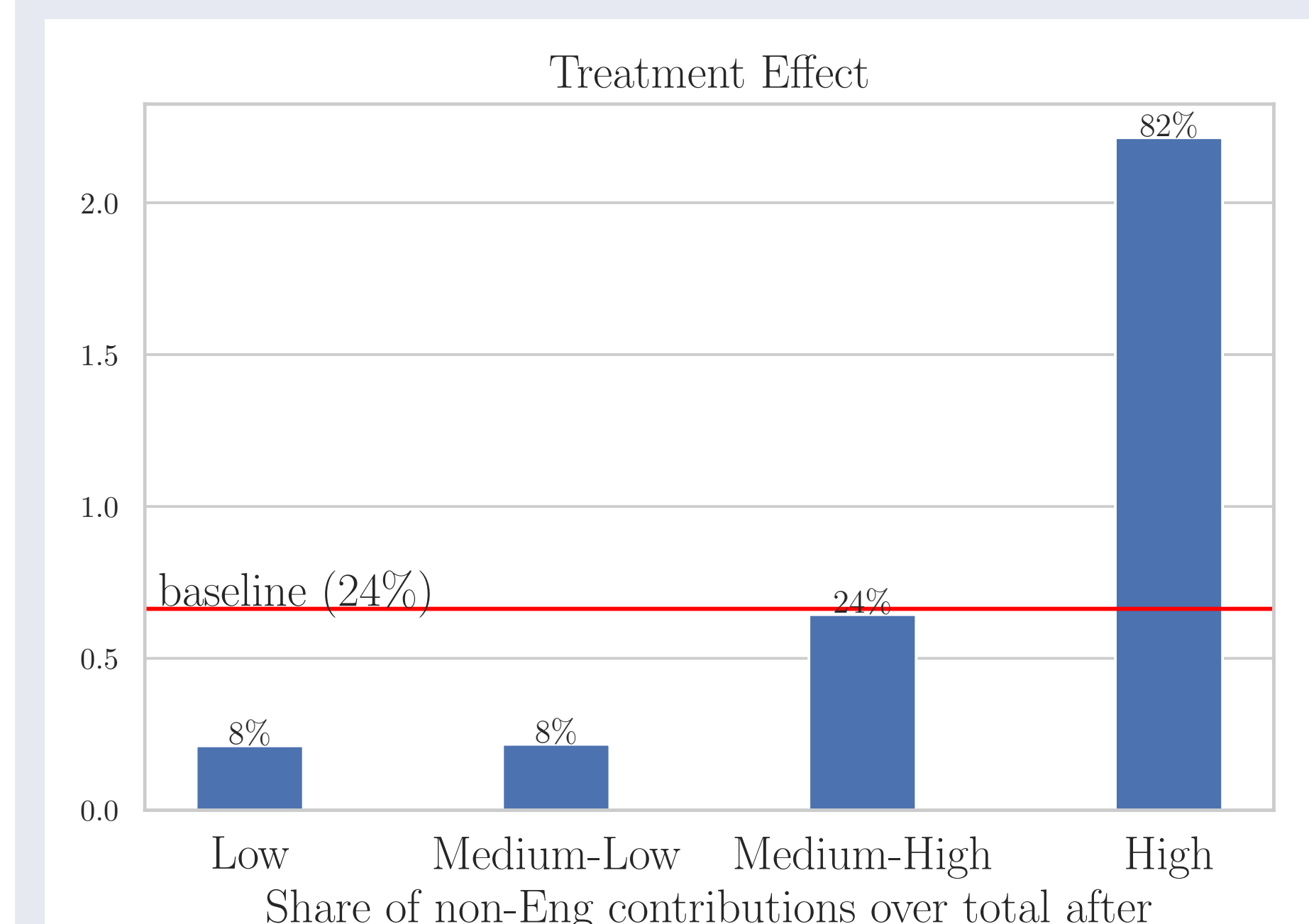
### Effect $\uparrow$ in questioner's effort



### Effect $\uparrow$ in incentives



### Driven by users with highest cost



## One or many Languages: What Trade-off for the Platform?

### Advantages of multiple languages

- $\uparrow$  **Communication Effectiveness**  
Users with scarce English skills **increase effort** and **solve the question** more likely
- $\uparrow$  **Community Size**  
At least 42% of non-native English users **start participating**
- **No Negative Externalities**  
Quantity and Quality in the English site is not substantially affected.

### Disadvantages of multiple languages

- $\uparrow$  **Low-Expertise Users**  
New joiners contribute lower quality than the others
- $\downarrow$  **Information Aggregation:**
  - $\uparrow$  **Redundant Effort**  
33.6% of programming software discussed is discussed in more than one language
  - $\uparrow$  **Information fragmentation**  
5% of programming software discussed is NOT discussed in English