

Paper Critique

Only one programming task:

There is no evidence that the findings would generalise to programming tasks other than JSON parser construction. This could be mitigated by including a variety of programming tasks in the experiment.

Working with unfamiliar devices and environment:

Most programmers have specific devices and development environments they prefer to work with; working with an unfamiliar device and environment may have impacted the participant's ability to complete the tasks. Allowing participants to work on a personal device in their preferred environment would be a possible mitigation strategy for this issue.

No internet access:

Participants had no access to the internet while completing this experiment, however, most professional programmers will use the internet as a resource while developing code. A possible mitigation strategy for this threat is to allow participants access to the internet but monitor their use to ensure no collusion or “cheating” occurs.

Skill level of participants:

The participants were not representative of the intended population (professional JavaScript/Java developers) because, at the time of the experiment, all participants were undertaking an introduction to programming course. In order to mitigate this threat, experienced developers should be the participants of the study.

Small sample size:

Due to the small sample size (five participants), there is a large margin for error in the results of this experiment. By increasing the number of participants, a reduction in the error margin will occur.

An inaccurate measure of productivity:

Using the number of lines written by participants is an inaccurate measure of productivity because the number of lines written does not indicate the functionality or efficiency of code. Alternatively, productivity should be measured by how quickly participants can build functional code.

Observer effect:

Having an observer in the room with the participants while completing the task may have impacted their performance; since the participants may have felt additional stress or used the observer's reactions to change their solution. By removing the observer from the room, the observer effect as a threat is mitigated.

Participants were JavaScript programmers:

The results from the experiment were skewed because all participants have previous experience coding in JavaScript and no experience with Java programming. One resolution to this issue is to use participants who have experience with both JavaScript and Java, in turn, there will be a fair comparison between the two languages.

Completing the same task twice once after the other:

Participants were asked to first write a parser in Java and then create the same parser in JavaScript; consequently, the results were affected because participants had already developed a

solution before undertaking the task a second time. One resolution is to have participants complete a different task for each language.

Allowing questions to be asked to the observer:

Allowing participants to ask the observer questions while completing the experiment meant that participants received different information and levels of assistance. This could be mitigated by having the answers to any questions repeated to all participants, thus ensuring that all participants receive the same information and assistance.

Inclusion of whitespace in number of lines calculation:

There is a dramatic impact on the results because of the inclusion of whitespace in the “number of lines” calculation; since some participants may use whitespaces for formatting and others may not. One mitigation strategy for this threat is to remove whitespaces from the “number of lines” calculation.