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Replication

NLP-RR: Researching Responsible and Trustworthy Natural Language Processing

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Overview

What is replication

Replication crisis

Practical considerations

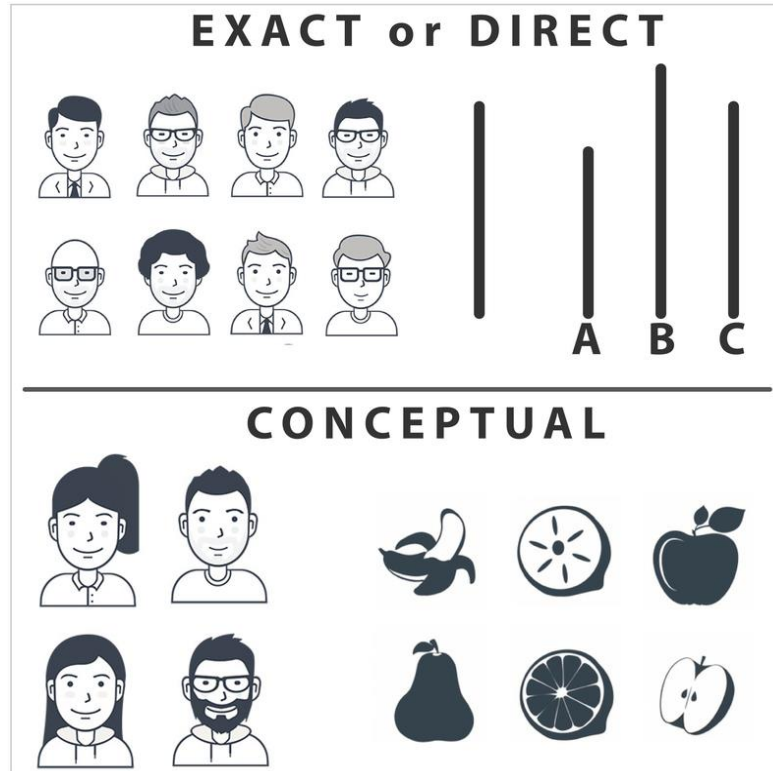


What is replication?

Reproduction of the results obtained from one study in other studies.

Essential to the advancement of knowledge and to make general claims.

Replication \neq reproducibility





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Why could an experiment fail to replicate?



Why could an experiment fail to replicate?

Results of prior study were due to chance.

The replication experiment has altered some relevant parameters.

The phenomenon under investigation varies across context.



When is a result significant?

A result is statistically significant when it is unlikely that it would have happened by chance.

The frequency of the observed pattern falls below the significance level (p value).

$$p < 0.05$$

This means there is less than a 5% chance that the result occurred by random luck.



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Activity 1

Go to the Miro board: <https://edin.ac/3zUS2Dp>



The replication crisis

2016 survey by Nature found that >70% researchers (in a total of 1576) have tried and failed to reproduce another experiment's results.

2015, first open empirical study of reproducibility in psychology.

100 studies in psychological science, only 36% yielded significant findings.

<https://osf.io/ezcu/j/>



10,000 hours study

The expert violin players are the ones who practice the most.

Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100(3), 363–406. <https://doi.org/10.1037/0033-295X.100.3.363>

Macnamara, B. N., & Maitra, M. (2019). The role of deliberate practice in expert performance: revisiting Ericsson, Krampe & Tesch-Römer, C. (1993). *Royal Society Open Science*, 6(8). <https://doi.org/10.1098/rsos.190327> (Original work published August 1, 2019)



Power pose study

Postural adjustments produce positive psychological, behavioural and hormonal outcomes.

Carney, Dana R., Amy JC Cuddy, and Andy J. Yap. (2010) "Power posing: Brief nonverbal displays affect neuroendocrine levels and risk tolerance." *Psychological science* 21.10: 1363-1368.

Amy Cuddy 2012 TED talk:

https://www.ted.com/talks/amy_cuddy_your_body_language_may_shape_who_you_are?subtitle=en

Ranehill, Eva, et al. (2015) "Assessing the robustness of power posing: No effect on hormones and risk tolerance in a large sample of men and women." *Psychological science* 26.5: 653-656.

Elkjær, Emma, et al. (2022) "Expansive and contractive postures and movement: A systematic review and meta-analysis of the effect of motor displays on affective and behavioral responses." *Perspectives on Psychological Science* 17.1: 276-304.



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Activity 2

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Practical considerations

Pre-analysis: sound data management practices, metadata stored alongside data, data backed up at every stage, store data in multiple locations.

During analysis: code annotated with comments, consistent coding style.

Post-analysis: provide code and data in supplementary material, archive data in online repositories, data and metadata available, describe preprocessing of data and all the steps of the computational analysis.



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Activity 3

Go to the Miro board: <https://edin.ac/3zUS2Dp>



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