

Tackling the replication crisis: Student theses should be collaborative replication studies

Leonie Twente & Onur Özsoy

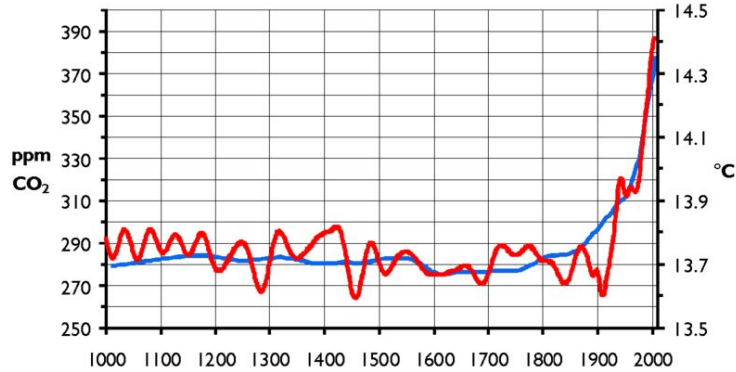


Leibniz-Zentrum
Allgemeine Sprachwissenschaft

Roadmap

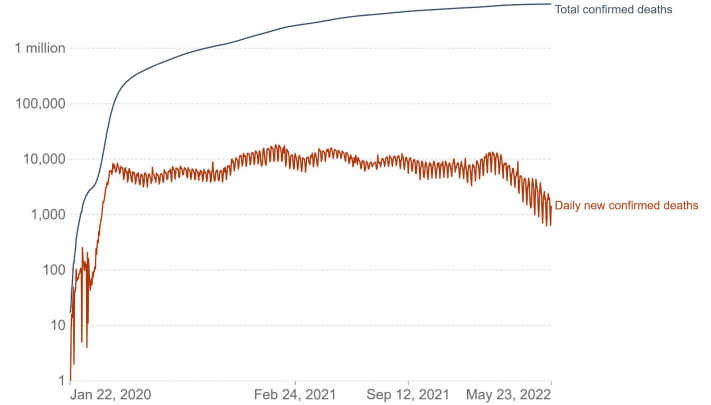
1. Replication crisis: Ways in and out
2. Role models for student-led replication
3. Building a student replication network

Crisis



Daily and total confirmed COVID-19 deaths, World

Due to varying protocols and challenges in the attribution of the cause of death, the number of confirmed deaths may not accurately represent the true number of deaths caused by COVID-19.



Source: Johns Hopkins University CSSE COVID-19 Data

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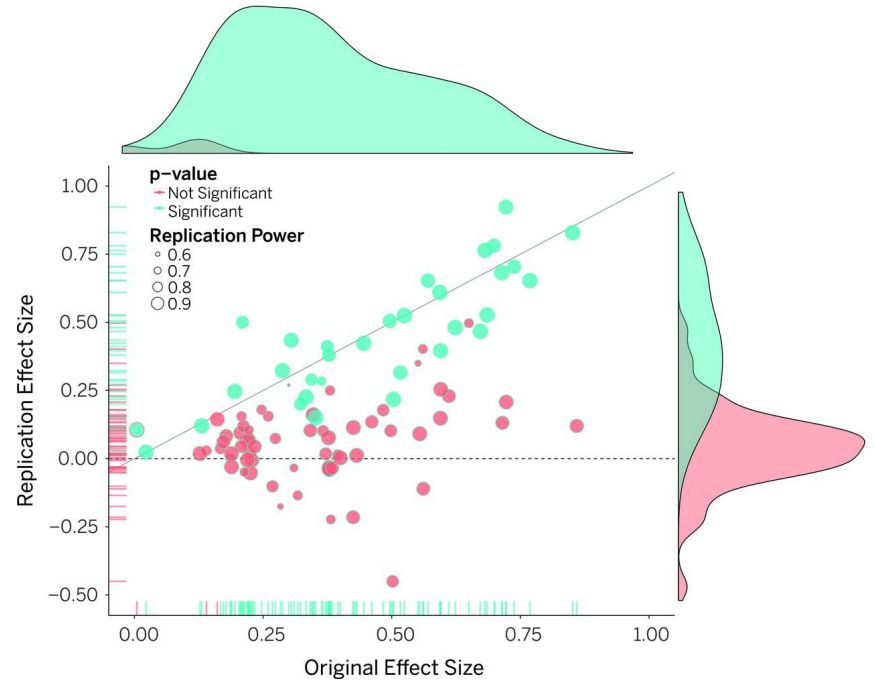
replication crisis



Replication crisis: ways in

- Reproducibility is a core element of science
- Several factors affect reproducibility
 - Sample size and statistical power
 - Study design (number of variables)
 - Availability of procedures and protocols
 - Availability of materials and stimuli
 - Availability of data and code

“Simulations show that for most study designs and settings, it is more likely for a research claim to be false than true.” (Ioannidis, 2005)



(Open Science Collaboration, 2015: 943)

Replication crisis: Implications for **linguistics**

Quantitative turn in linguistics

more reliance on quantitative practice, yet...

- lack of reflection on quantitative practice in most disciplines
- lack of teaching of quantitative practice

Replication failure

-> inadequate designs, lack of methodological rigor, context-sensitivity of language phenomena

(see The Special Issue in Linguistics: Sönning & Werner, 2021; Roettger & Baer-Henney, 2019)

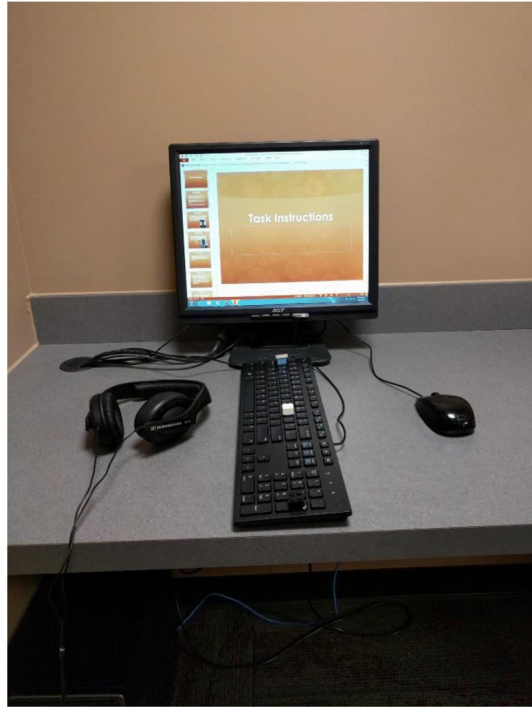
(Experimental) linguistics does not replicate enough!

“only **1** in 1600 experimental linguistic studies reports a direct replication performed by independent researchers” (Kobrock & Roettger, 2022, for a study on replication rates)

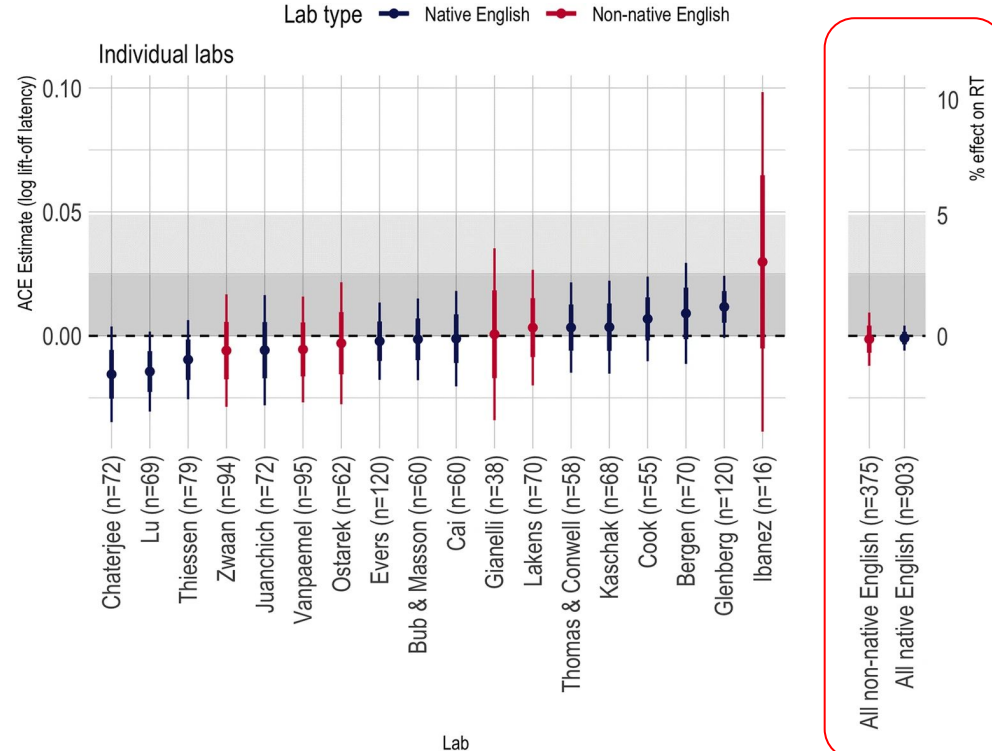
Failure to replicate more: Why?

- little (but growing) awareness of replication crisis (broader discourse) in the field
- institutional factors inhibiting replication studies (publication strategies and reporting practices)

An example fresh off the press: Morey et al, 2021



Setting for testing the Action-sentence Compatibility Effect (ACE)



Another recent example:

Cross-talker generalization in the perception of nonnative speech: A large-scale replication.

Xie, X., Liu, L., & Jaeger, T. F. (2021). Cross-talker generalization in the perception of nonnative speech: A large-scale replication. *Journal of Experimental Psychology: General*, 150(11), e22–e56. <https://doi.org/10.1037/xge0001039>

Up for further replications: All data, stimuli, and reproducible literate (R markdown) code are shared via OSF

Original study: Bradlow & Bent (2008)

sample: $N = 70$ participants

Finding: exposure to 5 min of accented speech can elicit improved recognition that generalizes to an unfamiliar talker of the same accent

Replication study:

asses the **replicability of Bradlow & Bent' findings** in two large-scale perception experiments

sample: $N = 640$

Replicated finding: robust evidence for cross-talker generalization after multitalker exposure.

New finding: Unlike BB08, we also find evidence for generalization after single-talker exposure

Replication crisis: **one way out**

Echoing Quintana (2021)

“Requiring undergraduate students to perform what is termed original research for their thesis, an investigation that cannot constitute a replication of an existing study, is a failed opportunity for science and education”

Good arguments for student theses replications:

1. **ideal candidates:** Young researchers are not constrained as much by institutional practices
(cf. also Roettger & Baer-Henney, 2019)
2. **Better theses:** students (**you!**) are the ones writing and struggling with final theses
(resource constraints, lack of skills)
3. **better training:** students (**you!**) gain research skills from the experience & contribute to science (add to accumulation of evidence and thereby more reliable data-based claims)

The vision of a Student Theses Replication Network Linguistics (STRENeL)

1. Form a vital network of students in language sciences
2. Define criteria for student-lead replications & develop guidelines
3. Determine studies that warrant a replication (“replication targets”)
4. Create a database of studies/projects that are eligible for replication in thesis projects
(e.g., Winter, Perlman, Perry & Lupyan, 2017, a study on iconicity ratings in sensory words)
5. Pilot replications to show the world the benefits of collaborative student replication
6. Raise awareness through big events and publications (e.g., STRENeL panel at the DGfS conference, 8.-10. March 2023 in Cologne)

The vision of a Student Theses Replication Network Linguistics (STRENeL)

How to join and proceed


1. Join mailing list <https://forms.office.com/r/AFbG4X5mwh>
2. Meet with more time & discuss how to proceed
3. Write a multi-author peer-reviewed journal paper with our ideas and demands

Stay in touch & join the discussion

Find us on Twitter:

Onur @_Onurunki

Leonie @LeonieTwente



The screenshot shows a Twitter thread. At the top, Onur Özsoy (@_Onurunki) has a tweet that says "could be something to advocate for, don't you think so @jungesprawi? (open access link: rdcu.be/cxkoR)". Below this is a quote tweet from Dan Quintana (@dsquintana) dated Sep 7, which discusses offering undergraduate students the option of performing a cumulative replication study for their theses instead of an original research project. The quote tweet includes a link to a nature.com article and a "Show this thread" button. Below the quote tweet, the main tweet's timestamp "8:40 PM · Sep 12, 2021 · Twitter for iPhone" is visible, along with "View Tweet activity", "2 Retweets", and "6 Likes". There are icons for replying, retweeting, liking, and sharing. Below these are two replies. The first reply is from Linda Gerisch (@Linda_TaylorsV) dated Sep 28, replying to @_Onurunki and @jungesprawi, stating that in Norway, it's already standard in the humanities to choose. The second reply is from Onur Özsoy (@_Onurunki) dated Sep 28, replying to Linda Gerisch, expressing interest in a discussion panel and a blog-post about the topic.

Onur Özsoy @_Onurunki
could be something to advocate for, don't you think so @jungesprawi?
(open access link: rdcu.be/cxkoR)

Dan Quintana @dsquintana · Sep 7
Offering undergraduate students the option of performing a cumulative replication study for their theses—instead of an original research project—would improve both science and education.

My new opinion piece in @NatureHumBehav

nature.com/articles/s4156...
[Show this thread](#)

8:40 PM · Sep 12, 2021 · Twitter for iPhone

||| View Tweet activity

2 Retweets 6 Likes

Reply Retweet Like Share

Tweet your reply Reply

Linda Gerisch @Linda_TaylorsV · Sep 28
Replying to @_Onurunki and @jungesprawi
In Norway, it's already standard in the humanities that you can choose.

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Onur Özsoy @_Onurunki · Sep 28
Cool! I'd love to hear more about that.
@Linda_TaylorsV, would you participate in a discussion panel about this @StuTS_official?
I'm sure we could get people from different systems/countries and think about collectively writing a blog-post for @jungesprawi cc @LeonieTwente

1 1 2

Recommended Reading and Resources

Learn about replication

Frank & Saxe (2012). Teaching Replication. <https://journals.sagepub.com/doi/pdf/10.1177/1745691612460686>

Quintana, D. S. (2021). Replication studies for undergraduate theses to improve science and education. *Nature Human Behaviour*, 5(9), 1117-1118.

Sönning, Lukas & Werner, Valentine (Hrsg.). 2021. The replication crisis: Implications for linguistics, Special issue in *Linguistics* 59(5).

Learn from examples

Collaborative Replications and Education Project (CREP) at <https://osf.io/wfc6u/>

Roettger, Timo B. & Baer-Henney, Dinah (2019). [Toward a replication culture: Speech production research in the classroom.](#) *Phonological Data and Analysis*, 4(1).

Ideas, comments and feedback



Speak and write, fellow linguists!

References

Ioannidis, J. P. (2005). Why most published research findings are false. *PLoS medicine*, 2(8), e124.

Kobrock, K. & Roettger, T. (2022). Assessing the replication landscape in experimental linguistics. Submitted to *Journal of Memory and Language*.

Larsson, Tove & Egbert, Jesse & Biber, Douglas. (2021). On the status of statistical reporting versus linguistic description in corpus linguistics: A ten-year perspective. *Corpora*. 17.

Morey, R. D., Kaschak, M. P., Díez-Álamo, A. M., Glenberg, A. M., Zwaan, R. A., Lakens, D., ... Ziv-Crispel, N. (2021). A pre-registered, multi-lab non-replication of the action-sentence compatibility effect (ACE). *Psychonomic Bulletin & Review*. doi:10.3758/s13423-021-01927-8

Open Science Collaboration (2015). Psychology. Estimating the reproducibility of psychological science. *Science*, 349(6251), aac4716.

Quintana, D. S. (2021). Replication studies for undergraduate theses to improve science and education. *Nature Human Behaviour*, 5(9), 1117-1118.

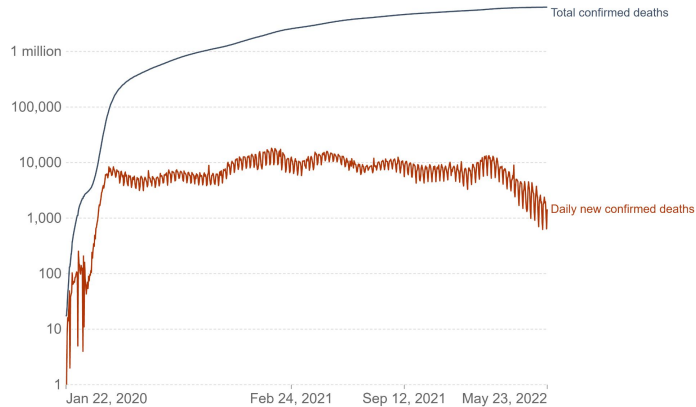
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Bonus: Normalize your data

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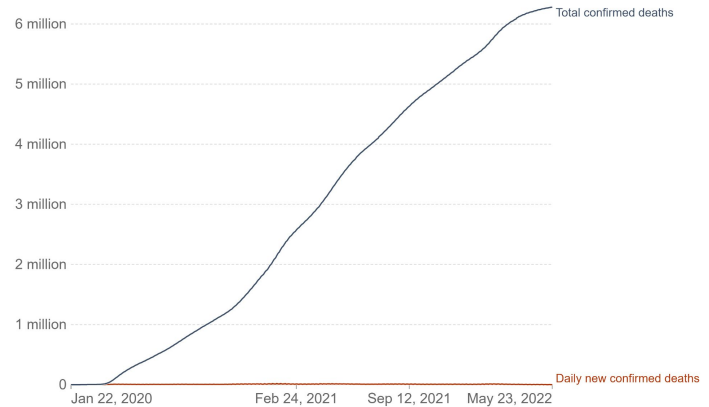


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