Teaching Replication

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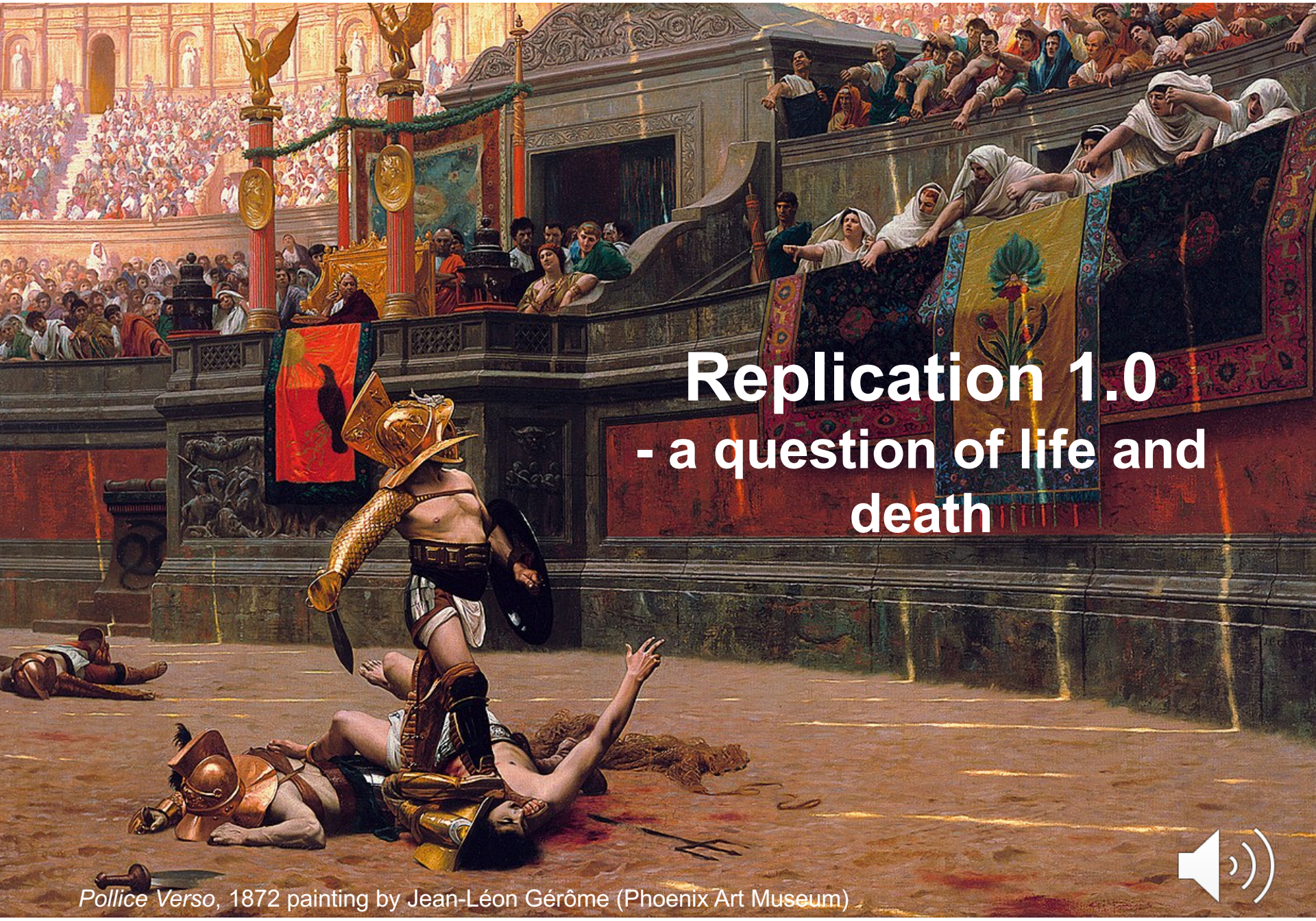
Slide from Florian Markowetz

REPLICATION POLICE



Replication 1.0
- a question of life and death

Pollice Verso, 1872 painting by Jean-Léon Gérôme (Phoenix Art Museum)

Replication 2.0
- overcoming obstacles

How can we teach constructive replications?

1 Transparent planning

Duplication vs. Replication

Duplication	Replication
Verification of research results	Test robustness of research results
• did errors occur that would reverse findings?	• suboptimal methods or data? • narrow contexts?
same data ***same methods*** *-> same results expected*	***new data*** ***new methods*** *-> diverging results unsurprising*

Guidance From Course Instructors

Clear aim:
Are students conducting a replication or duplication?

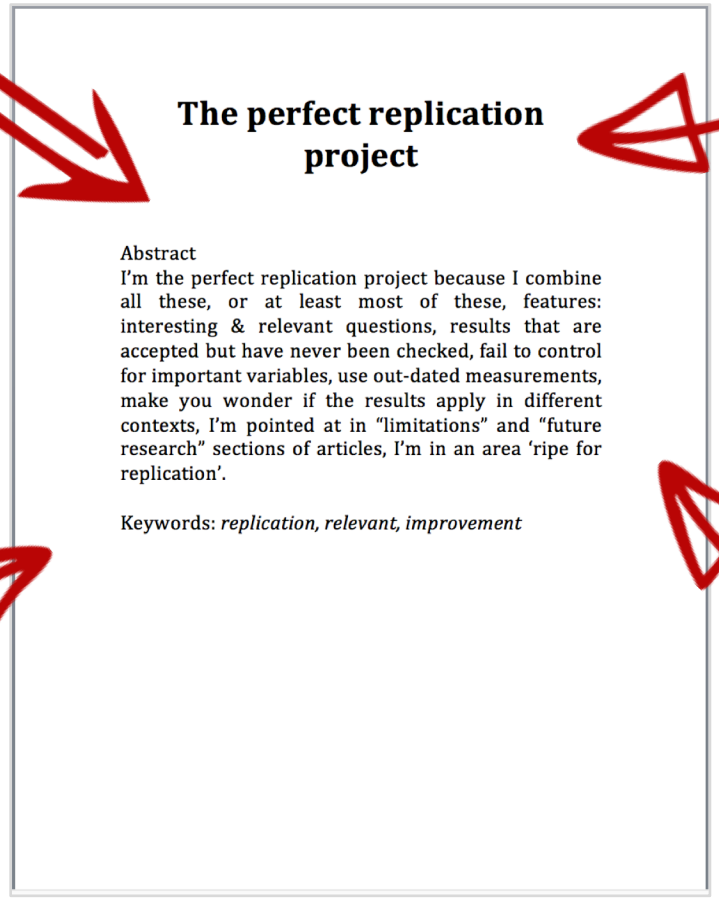
Be transparent & reproducible:

1. **Selection**: How will they select the original study for replication?
2. **Pre-register:** Can they avoid accusations of error hunting?
3. **Cross-check:** Who will cross-check the replication results before reporting them?
4. **Authors:** Will they contact the original authors and can you help them with an email template?
5. **Publication:** Do students plan journal submission or is this for learning purpose only?

Which study should I pick?

Relevant research with **impact**

Outdated measures



The perfect replication project

Abstract

I'm the perfect replication project because I combine all these, or at least most of these, features: interesting & relevant questions, results that are accepted but have never been checked, fail to control for important variables, use out-dated measurements, make you wonder if the results apply in different contexts, I'm pointed at in "limitations" and "future research" sections of articles, I'm in an area 'ripe for replication'.

Keywords: *replication, relevant, improvement*

Results widely **accepted** but never checked

Missing **control** variables

Students: pick a study where they can handle the methods…

Practical steps in a replication study

1 Select paper

2 Access data & code

3 Identify each variable

2-3 weeks

4 Reproduce tables, figures

5 Compare results

3-4 weeks

If you got to this point, you completed a **duplication.**

Your replication class could end here.

Practical steps in a replication study (II)

6 Add value (extension)
- new data
- new variables
- new model specifications
- theoretical contributions

4-6 weeks

7 Compare & Write-up

8 Get feedback from peers (cross-check)

9 Journal submission

months

You now completed a full **replication!**

Several of my students have published their replication after class.

https://osf.io/hqr3j

International Studies Perspectives

International Studies Perspectives (2015), 1–16.

Bringing the Gold Standard into the Classroom: Replication in University Teaching[1]

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Reproducibility is held to be the gold standard for scientific research. The credibility of published work depends on being able to replicate the results. However, there are few incentives to conduct replication studies in political science. Replications are difficult to conduct, time-consuming, and hard to publish because of a presumed lack of originality. This article sees a solution in a profound change in graduate teaching. Universities should introduce replications as class assignments in methods training or invest in new stand-alone replication workshops to establish a culture of replication and reproducibility. This article will

2

Rhetorical **sensitivity**

Avoid binary judgments

Don’t make it personal

Honest mistakes are human

“Replication Chains”

Original Study → Duplication Replication → Original author comment

What **replicators** write

"We … find that coding **errors**, selective exclusion of available data, and unconventional weighting of summary statistics lead to **serious errors**" (Herndon et al. 2013)

"If we cannot even reproduce the original results using the same publicly available data, there is **no need for further commentary**." (Miller et al, 2001)

How original authors **respond**

"less realistic", "inconsistent with the substantive literature," and "**of limited utility**" (Mansfield, Milner, and Rosendorff 2002)

"fundamentally **flawed**"
(Peffley, Knigge, and Hurwitz 2001)

"statistical, computational, and reporting errors that **invalidate its conclusions**" (Gerber and Green 2005:301).

What **constructive** replicators write

"this is **not a critique** of existing papers, which **faithfully report careful** studies … Rather, replication with a different event, sample, and time is a **way to move the literature forward** to assess robustness"

"**not** be taken as definitive evidence that the extant literature over-states the extent of irrelevant events; yet, it serves as a (cautionary) **prompt to the next generation** of work."

(Busby and Druckman 2018)

Replicate others as you would like to be replicated yourself!

PROFESSION SYMPOSIUM

Replicate Others as You Would Like to Be Replicated Yourself

Nicole Janz, *University of Nottingham*
Jeremy Freese, *Stanford University*

https://osf.io/6ed5a

Merton (1973 [1942]) famously presented "organized skepticism" as a necessary normative condition for effective science. To succeed as a self-correcting enterprise, scientific communities cannot wall off any part of themselves from reevaluation and potential revision. One revelation of the open science movement has been how much the conventional "closed-science" practices prevailing in much of political science and elsewhere undermine the possibility for effective critical scrutiny (Elman, Kapiszewski, and Lupia 2018).

Replication projects revisit existing findings and, as such, serve as the "acme" of organized skepticism (King 1995). Replications are recognized as fundamental for the scientific enterprise in principle, but they also lead to replication projects often being discouraged and fraught in practice. In a sense, replications are deliberately not original and not pathbreaking, which diminishes the enthusiasm among journal editors to publish them. Being subject to a replication project, meanwhile, often is regarded less as flattering than as something to fear.

Replication projects are thus both necessary and intrinsic- conducting projects in line with ideals and encouraging ideals in others are available to researchers for contributing to an improved culture that is closer to reality.

CLARIFYING PURPOSE

Researchers should be clear about why an existing finding has been selected for a replication project. When projects do not explain why a particular study was selected for reexamination, original authors may feel that they are being personally attacked. Journal editors may be puzzled about the stakes in revisiting this specific finding as opposed to the many other published findings that no one else has tried to replicate. Given how many published papers are never cited, simple skepticism alone is a weak justification for all of the effort that a conscientious replication project entails.

A clear explanation of why a study's claim was chosen to be revisited also helps readers to understand the value of t undertaking. The best rationales for undertaking a replication project connect its implications to the broader influence of the study in question or to broader debates of which the original

Thank you!

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