



# Ego Depletion is the Best Replicated Finding in All of Social Psychology

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Received: 📅 February 08, 2022

Published: 📅 February 16, 2022

## Abstract

We suggest four criteria for considering an effect to be well replicated: many supportive findings, preferably with multiple methods and multiple labs, and few or no contrary significant findings; preregistered successful replications; significant findings from multi-site replication; and real-world or non-laboratory findings. Ego depletion is the finding that after expending effort on one self-control task, performance on other self-control and decision tasks is impaired. It does well by all four criteria. In particular, only five findings have survived multi-site replication attempts in social psychology, and ego depletion is one of them. It has a stronger record by the other criteria than the other four. Although possibly other criteria would yield a different conclusion, the case for ego depletion as social psychology's best replicated finding is quite strong.

**Keywords:** Self-control; Self-regulation; Ego Depletion; Replication

## Introduction

Ego depletion refers to a common finding that after exerting effort on one self-control task, people show impaired performance on a subsequent self-control task. The initial emphasis on self-control has been extended to effortful decision making, planning, and initiative [1]. We were recently pleased to learn that ego depletion has a strong case to be considered the best replicated finding in social psychology. This emerged as a side point in a major review we conducted on multi-site replication attempts in social psychology, which have become important in the recent years during the so-called replication crisis [2].

To nominate a particular point as the best replicated finding in a large and diverse field is a bold undertaking. Naturally it begins with selection of criteria as to exactly how replication success should be measured. We propose four criteria. First, there should be plenty of significant findings in support of it, preferably from multiple laboratories (so it is not just due to something one particular lab group does) and with multiple methods (in case any one method is flawed or confounded). Friese, et al. [3] counted 600 findings in the literature several years ago, with essentially no significant findings in the opposite direction (which rules out capitalizing on chance, p-hacking, and the like, because those would work in both directions). There are also many more unpublished but supportive findings. Right from the start, we and others have emphasized the importance of using multiple methods. Many laboratories have published ego depletion effects,

including quite a few researchers we have never met or helped. An early meta-analysis concluded that effect sizes from our lab were no larger than what other, independent labs obtained, which again indicates that our own work did not have any special power or advantages [4].

Second, recent years have seen the advent of preregistration, which reduces the so-called researcher degrees of freedom. For a phenomenon to claim to have high success at replication, at least one pre-registered study would be necessary. Garrison, et al. [5] reported two such studies, and others have also been published [6]. Third, the multi-site replication process has arisen in recent years. Our review concluded that the multi-site process is biased toward false negative findings in social psychology for several reasons, including failure to engage the participant [2]. Still, it is fair to expect a significant finding from a multi-site replication in order to qualify as possibly the best replicated finding. The multi-site replication requirement is the bottleneck in the competition for claiming to be the best replicated finding. Our literature review found 35 published multi-site replications in social psychology dedicated to one or another particular finding [2]. Only five of them were clear successes, with four others having mixed results. Those five would thus be the main contenders for the title of best replicated. Fortunately, ego depletion is one of them: Dang, et al. [7] reported an ego depletion study with 12 different labs that found significant support.

Some readers will know of two other multi-site attempts to replicate ego depletion. Hagger et al. [8] reported a null result, but they used a strange and untested procedure, so they were not actually replicating any previous study. They found no effect on the main manipulation check (fatigue), indicating that they failed to manipulate the independent variable, which means they did not provide a test of the theory. The second manipulation check (effort) did find a significant difference. Although our review coded Hagger et al. as a failure, a reanalysis of their data by Dang [9] using the manipulation check data found that, to the limited extent to which the manipulation worked, it did provide significant support for ego depletion. The other attempt was by Vohs et al. [10], which was compromised by excluding data from a third of their sample. When they analyzed all their data, the result was significantly in support of ego depletion, but after excluding over a thousand participants, the effect dropped just below significance. Thus, with one solid success at multi-site replication, and two others with a mixture of significant and nonsignificant results, ego depletion is an unusual success story on this criterion.

For the fourth criterion, which is perhaps less imperative than the others, we would suggest some real-world findings, such as field studies or big-data analyses. The value of this is to show that the finding is not merely something that can be obtained under laboratory conditions but is actually operating in the real world. As contrasting examples, the McGurk and Stroop effects have a good record of replication in laboratory experiments but do not seem to be frequent or important occurrences in daily life. To be sure, real-world data often lack the full control of the laboratory (which is why scientists use laboratories!) and so are more vulnerable to confounds, and so replication purists might reject this criterion. But we think a field's best replicated finding should be something that has been shown outside the laboratory too.

On this criterion too, ego depletion has a strong record. Examples include health care workers neglecting to wash hands Dai, et al. [11], students cheating more on tests [6], physicians over-prescribing opioids [12] and under-ordering diagnostic tests [13], parole judges becoming less lenient [14], student test performance declining [15], physicians over-prescribing antibiotics [16], soccer referees performing worse [17], and auditors coping less well with busy season [18]. Experience sampling studies have shown ego depletion in ordinary people's daily lives [19,20]. Hunte, et al. [21] provided a meta-analysis of a great many studies showing that ego depletion impairs a variety of athletic and sport performances.

Again, the multi-site replication is the most severe criterion, with only five clear successes. Three of those are quite narrowly focused and hence do not fare well by the other criteria. Specifically, people look at someone when they expect him to speak [22]; eyewitnesses who discuss the incident before testifying can influence each other's testimony [23]; and people say hypothetically that they would be more willing to reconcile after receiving an independent message of

social acceptance [24]. That leaves only the Elaboration Likelihood Model of persuasion as a serious competitor for the title of best replicated finding. It has one successful and one failed multi-site replication, and we give greater credence to the success [25,26]. The successful one technically was a social-personality hybrid, given that one of the independent variables was a personality trait. We have long admired the ELM and think it does reasonably well by the other criteria we listed, but we think ego depletion has the edge. There is also reportedly a multi-site replication of cognitive dissonance underway, and if it yields significant support, it will very likely take over first place as best replicated finding. But as we have already noted, most multi-site replications in social psychology are failures, so it is necessary to wait and see.

There has been considerable misleading and fake news about the replicability of ego depletion. The evidence is quite clear, however, that its record of successful replication is among the best and quite possibly the single best in all of social psychology.

## References

1. Baumeister RF & Vohs KD (2016) Strength model of self-regulation as limited resource: Assessment, controversies, update. *Advances in Experimental Social Psychology* 54: 67-127.
2. Baumeister RF, Tice DM & Bushman BJ (2022) A review of multi-site replication projects in social psychology: Methodological ideal or collective self-destruct mechanism?.
3. Friese M, Loschelder DD, Gieseler K, Frankenbach J, Inzlicht M (2019) Is ego depletion real? An analysis of arguments. *Personality and Social Psychology Review* 23(2): 107-131.
4. Hagger M S, Wood C, Stiff C, Chatzisarantis NLD (2010) Ego depletion and the strength model of self-control: A meta-analysis. *Psychological Bulletin* 136(4): 495-525.
5. Garrison K E, Finley A J, Schmeichel B J (2019) Ego depletion reduces attention control: Evidence from two high-powered preregistered experiments. *Personality and Social Psychology Bulletin* 45(5): 728-739.
6. Keller T, Hiss H J (2021) Do exhaust primary school students cheat more? A randomized field experiments. *PLoS One* 16 (12): e0260141.
7. Dang J, Barker P, Baumert A, Bentvelzen M, Berkman E, et al. (2021) A multilab replication of the ego depletion effect. *Social Psychological and Personality Science* 12(1): 14-24.
8. Hagger MS, Chatzisarantis NLD, Alberts H, Anggono CO, Batailler C, et al. (2016) A multilab preregistered replication of the ego-depletion effect. *Perspectives on Psychological Science* 11(4): 546-573.
9. Dang J (2016) Commentary: A multilab preregistered replication of the ego depletion effect. *Frontiers in Psychology* 7: 1155.
10. Vohs K, Schmeichel B, Lohmann S, Gronau, Quentin F, et al. (2021) A multi-site preregistered paradigmatic test of the ego depletion effect. *Psychological Science* 32(10): 1566-1581.
11. Dai H, Milkman KL, Hofmann DA & Staats BR (2015) The impact of time at work and time off from work on rule compliance: The case of hand hygiene in health care. *Journal of Applied Psychology* 100: 846-862.
12. Philpot LM, Khokhar BA, Roellinger DL, Ramar P, Ebbert JO (2018) Time of day is associated with opioid prescribing for low back pain in primary care. *Journal of General Internal Medicine*, online publication 33(11): 1828-1830.

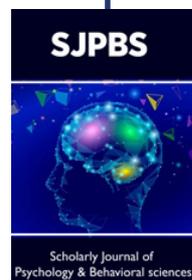
13. Trinh P, Hoover DR, Sonnenberg FA (2021) Time-of-day changes in physician clinical decision making: A retrospective study. *PLoS One*.
14. Danziger S, Levav J & Avnaim-Pessoa L (2011) Extraneous factors in judicial decisions. *PNAS* 108: 6889-6892.
15. Sievertsen HH, Gino F, Piovesan M (2016) Cognitive fatigue influences students' performance on standardized tests. *PNAS* 113 (10): 2621-2624.
16. Linder J A, Doctor JN, Friedberg MW, Harry RN, Caroline B (2014) Time of day and the decision to prescribe antibiotics. *JAMA Internal Medicine* 174 (12): 2029-2031.
17. Samuel RD, Englert C, Zhang Q, Basevitch I (2018) Hi ref, are you in control? Self-control, ego-depletion, and performance in soccer referees. *Psychology of Sport and Exercise* 38: 167-175.
18. Hurley P J (2015) Ego depletion: Applications and implications for auditing research. *Journal of Accounting Literature* 35: 47-76.
19. Baumeister RF, Wright BRE & Carreon D (2019) Self-control "in the wild": Experience sampling study of trait and state self-regulation. *Self & Identity* 18: 494-528.
20. Hofmann W, Vohs KD, Baumeister RF (2012) What people desire, feel conflicted about, and try to resist in everyday life. *Psychological Science* 23(6): 582-588.
21. Hunte R, Cooper SB, Taylor IM, Nevill ME, Boat R (2021) The mechanisms underpinning the effects of self-control exertion on subsequent physical performance: A meta-analysis. *International Review of Sport and Exercise Psychology*.
22. Rabagliati H, Corley M, Dering B, Hancock PJB, King JPI, et al. (2020) Many Labs 5: Registered replication of Crosby, Monin, and Richardson (2008). *Advances in Methods and Practices in Psychological Science* 3(3): 353-365.
23. Ito, Hiroshi, Barzykowski, Kristian, Grzesik (2019) Eyewitness memory distortion following co-witness discussion: A replication of Garry, French, Kinzett, and Mori (2008) in ten countries. *Journal of Applied Research in Memory and Cognition* 8(1): 68-77.
24. Baranski, E, Baskin E, Coary S, Ebersole CR, Krueger LE, et al. (2020) Many Labs 5: Registered replication of Shnabel and Nadler (2008), Study 4. *Advances in Methods and Practices in Psychological Science* 3(3): 405-417.
25. Ebersole CR, Alaei R, Atherton OE, Bernstein MJ, Brown M et al. (2017) Observe, hypothesize, test, repeat: Luttrell, Petty and Xu (2017) demonstrate good science. *Journal of Experimental Social Psychology* 69: 184-186.
26. Galiani S, Gertler P, Romero M (2017) Incentives for replication in economics.



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DOI: [10.32474/SJPBS.2021.06.000234](https://doi.org/10.32474/SJPBS.2021.06.000234)



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