

Errata

On Coppock and Kaur (2022), *American Journal of Political Science* 66(3)

This note lists ten corrections to “Qualitative Imputation of Missing Potential Outcomes,” published in *American Journal of Political Science* 66(3), doi [10.1111/ajps.12697](https://doi.org/10.1111/ajps.12697). **None of them changes a conclusion of the article.** The extreme value bounds on the average treatment effect, which are the article’s headline result, are unchanged at [-2, 49] with a width of 51 points, as are every number in the abstract, the expert survey comparison in Figure 4, Table 5, and every quantity in the end-of-conflict application in Appendix A. **One published quantity does move materially:** the average treatment effect on the treated, which the article summarizes as a -15 percentage point effect and which is -22.5 points once the imputation probabilities the article’s own appendix C states are the ones the analysis uses.

The first two entries are transcription errors in the deposited case data, and the four that follow are their consequences. The imputed potential outcomes in this article are not measurements. They are qualitative judgments, set out case by case in appendix C with the reasoning behind each one, and the deposited `cases_clean.csv` is a transcription of those judgments. Seven of its imputation probabilities do not match the probability the appendix C narrative for that case states. Correcting them restores what the article always said it was doing.

Every corrected value is computed at the time this document is rendered, from the deposited replication archive ([10.7910/DVN/2IVKXD](https://doi.org/10.7910/DVN/2IVKXD)) with those seven probabilities restored. The bounds are computed exactly, where the deposited script estimates them by simulation. It is the same quantity by a different route rather than a different estimator: a bound is affine in the imputed potential outcomes, so the distribution the deposit draws from can be written down and averaged, and the two agree to within the error of the simulation. What computing it exactly changes is that a bound falling exactly halfway between two whole numbers is visible as such, rather than being settled by whichever side an unseeded draw happened to land on. The code supporting each correction is at github.com/active-maintenance-aec/coppock_kaur_2022. Bold marks the values that change; unbolded numbers are recomputed rather than copied, so a reader diffing published against corrected sees every quantity verified and not only the ones at issue.

1. Three imputation probabilities carried as their complements

Appendix C states an imputation probability for 30 of the 31 imputed democratization cases; the exception, Thailand (1991-1992), refers to the entry above it. Twenty-three of the 30 agree with the deposited case file exactly. In three of the remaining seven the deposit, and appendix Table B.2 with it, carries one minus the stated probability:

Case	Appendix C	Imputed	Published	Corrected
South Africa (1910-1994)	C.2.7	1	0.2	0.8
Central African Rep (1981-1993)	C.4.12	1	0.3	0.7
Sierra Leone (1992-1996)	C.4.13	1	0.3	0.7

Note: The imputation probability appendix Table B.2 prints for each case, against the probability the appendix C entry named in the second column states for the same case. The Imputed column is the imputed potential outcome, which agrees with appendix C in every one of these cases and is not corrected.

In all three the deposit contradicts itself, because an imputed potential outcome of 1 sits beside a probability below one half. Appendix Table B.2 prints the deposited value, so the published table inherits the transcription error rather than committing a second one. Section C.2.7 reads “we imputed that $\hat{Y}_i(0) = 1$, with a probability of 0.8” for South Africa, and the main text says the same thing on page 10: “In other words, $Y_i(0) = 1$ with a probability of .8.” Sections C.4.12 and C.4.13 read “with a probability of 0.7.”

2. Four imputation probabilities differing by one step

The remaining four disagreements are not complements. Each differs from the stated probability by 0.1:

Case	Appendix C	Imputed	Published	Corrected
Ghana (1981-1993)	C.3.2	0	0.1	0.2
Uruguay (1973-1984)	C.3.6	1	1	0.9
Sierra Leone (1997-1998)	C.4.8	0	0.2	0.1
Nicaragua (1979-1990)	C.4.10	1	0.8	0.9

Note: As above. None of these four crosses one half, so none of them puts a probability on the wrong side of the potential outcome it is attached to, and none changes an imputed value.

Uruguay is the one of the four that matters beyond the table: at the deposited 1 it is an imputation made with certainty, and at the 0.9 appendix C states it is a probabilistic one. That is what entry 6 below turns on.

The corrected rows of appendix Table B.2, in the order the published table prints them:

Case	d_i	Y_i	Observed	$\tilde{Y}_i(0)$	$\tilde{Y}_i(1)$	Probability	$\tilde{\tau}_i$
South Africa (1910-1994)	1	0	0	1	0	0.8	-1
Ghana (1981-1993)	0	0	0	0	0	0.2	0
Uruguay (1973-1984)	0	0	0	0	1	0.9	1
Sierra Leone (1997-1998)	0	0	0	0	0	0.1	0
Nicaragua (1979-1990)	0	0	0	0	1	0.9	1
Central African Rep (1981-1993)	0	1	1	1	1	0.7	0
Sierra Leone (1992-1996)	0	1	1	1	1	0.7	0

Note: The seven rows of appendix Table B.2 whose imputation probability is corrected. Every other cell in these rows is as published. The published table sorts each step block by imputed value and then by probability, so restoring the stated probabilities would also reorder two blocks; the published order is kept here so the rows can be found on the page.

3. The average treatment effect on the treated

Published, *Imputing Missing Potential Outcomes*, Summary:

The bounds on the ATU are greater than 58 points wide, compared with the bounds on the ATT, which shrink all the way down to a point. We can summarize the ATT as a **-15** percentage point effect on return to authoritarianism.

Corrected:

The bounds on the ATU are greater than 58 points wide, compared with the bounds on the ATT, which shrink all the way down to a point. We can summarize the ATT as a **-22.5** percentage point effect on return to authoritarianism.

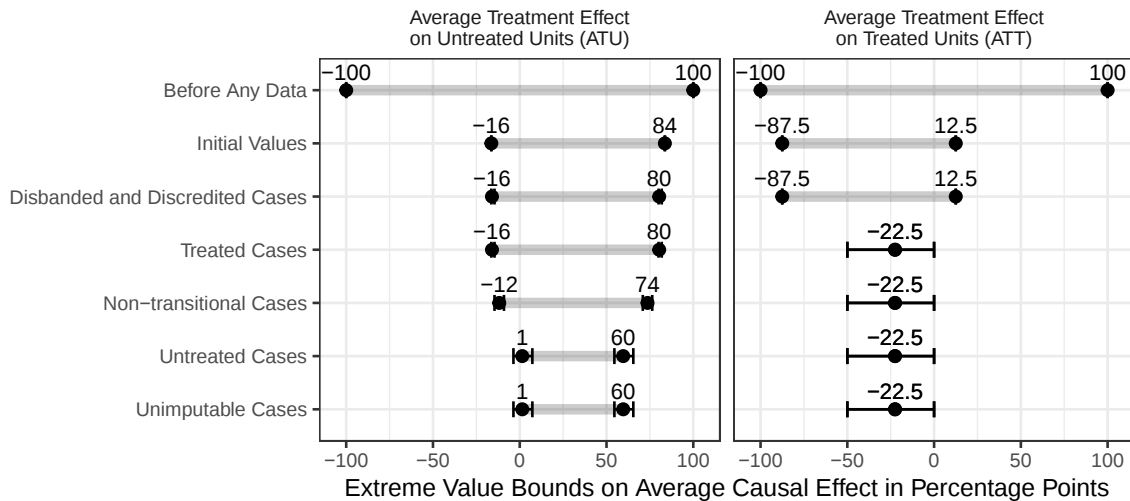
Every treated case has both potential outcomes filled in by the second imputation step, which is why the ATT bounds collapse to a point, and that point is the mean of the eight observed treated outcomes minus the mean of the eight imputed untreated ones. South Africa is one of the eight, so restoring its probability from 0.2 to the 0.8 appendix C states moves the ATT by 7.5 points. The -22.5 is exact and not a draw: with both potential outcomes of all eight treated cases imputed, the bound is a fixed function of the imputation probabilities, and this is its value. It falls exactly halfway between two whole numbers, so a whole-number restatement of the sentence would not be determined, which is a further reason to correct it at one decimal as this document corrects every percentage-point quantity. The ATU claim in the first clause is unaffected and is left at the precision the article states it: the width is 58.2 points before the correction and after it, because both ATU bounds move by the same amount, so the published “greater than 58” holds exactly as written and is not restated at one decimal here.

4. Figure 3, the bounds by treatment status

The corrected Figure 3 is reprinted below. The ATT bounds move at every step from *Treated Cases* onward, and the ATU bounds move at *Untreated Cases* and *Unimputable Cases*.

Estimand	Step	Published	Corrected
ATU	Before Any Data	[-100, 100]	[-100.0, 100.0]
ATU	Initial Values	[-16, 84]	[-16.4, 83.6]
ATU	Disbanded and Discredited Cases	[-16, 80]	[-16.0, 80.4]
ATU	Treated Cases	[-16, 80]	[-16.0, 80.4]
ATU	Non-transitional Cases	[-12, 74]	[-11.8, 73.6]
ATU	Untreated Cases	[0, 58]	[1.5, 59.6]
ATU	Unimputable Cases	[0, 58]	[1.5, 59.6]
ATT	Before Any Data	[-100, 100]	[-100.0, 100.0]
ATT	Initial Values	[-88, 12]	[-87.5, 12.5]
ATT	Disbanded and Discredited Cases	[-88, 12]	[-87.5, 12.5]
ATT	Treated Cases	[-15, -15]	[-22.5, -22.5]
ATT	Non-transitional Cases	[-15, -15]	[-22.5, -22.5]
ATT	Untreated Cases	[-15, -15]	[-22.5, -22.5]
ATT	Unimputable Cases	[-15, -15]	[-22.5, -22.5]

Note: Published labels are transcribed from Figure 3, which prints whole numbers. Corrected values are exact. **The corrected democratization ATT is exactly -22.5, halfway between two whole numbers, so no whole-number label is determined:** the deposited figure script estimates this bound by simulation and sets no seed, and the draw lands either side of the boundary with about equal probability. Repeating that simulation at twenty seeds gives [-22, -22] at 12 and [-23, -23] at 8. The published -15 is not on a boundary and is stable.

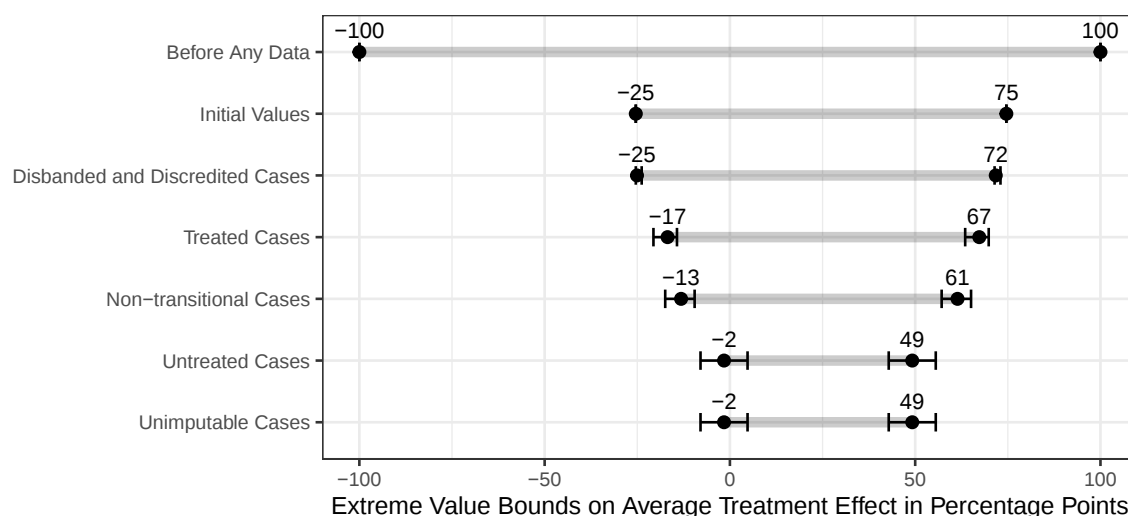


Note: Figure 3 recomputed with the seven appendix C probabilities restored, and with the bounds computed exactly rather than simulated, so the labels are the same on every run. The ATT labels from *Initial Values* onward carry a decimal, because at every one of those steps the bound falls exactly halfway between two whole numbers and no whole number states it.

5. Figure 2, the bounds on the average treatment effect

Step	Published	Corrected
Before Any Data	[-100, 100]	[-100.0, 100.0]
Initial Values	[-25, 75]	[-25.4, 74.6]
Disbanded and Discredited Cases	[-25, 72]	[-25.1, 71.7]
Treated Cases	[-16, 68]	[-16.8, 67.3]
Non-transitional Cases	[-12, 62]	[-13.2, 61.4]
Untreated Cases	[-2, 49]	[-1.6, 49.2]
Unimputable Cases	[-2, 49]	[-1.6, 49.2]

Note: As above. Two steps move and the rest do not. The final two rows are the article's headline bounds, and they are unchanged: both corrected values round to the labels the published figure prints.



Note: Figure 2 recomputed with the seven appendix C probabilities restored.

6. How the 63 missing potential outcomes were imputed

Published, *Imputing Missing Potential Outcomes*:

For all 63 unobserved potential outcomes, we imputed **5** with certainty, **26** probabilistically and we left 32 unimputed.

Corrected:

For all 63 unobserved potential outcomes, we imputed **3** with certainty, **28** probabilistically and we left 32 unimputed.

An imputation is made with certainty when the stated probability that the missing potential outcome equals 1 is exactly 0 or exactly 1. Three cases qualify: Brazil (1964-1985) at 0 and the two Thailand transitions at 1. The deposit adds a fourth, Uruguay (1973-1984), which it carries at 1 where appendix C entry C.3.6 states 0.9. The number left unimputed, and the 31 imputed in total, are unaffected either way.

7. The toy example’s treated outcomes

Published, *A Toy Example*:

The outcome for **three** of the treated units and one of the untreated units is 1; the outcome is equal to 0 for the remaining units.

Corrected:

The outcome for **four** of the treated units and one of the untreated units is 1; the outcome is equal to 0 for the remaining units.

Table 3, reprinted below, shows four treated units with an observed outcome of 1, and the deposited code that builds the example encodes four. Four is also what the [-40, 60] initial bounds two sentences later require; three would give [-50, 50].

Unit	d_i	Y_i
1	1	1
2	1	1
3	1	1
4	1	1
5	1	0
6	1	0
7	1	0
8	0	1
9	0	0
10	0	0

Note: The observed columns of Table 3, drawn from the deposited replication archive by `maintained/table_3_toy_example.R`. Nothing in the table is corrected; it is reprinted because it is the authority the sentence disagrees with.

8. The probabilistic extension’s stated probabilities

Published, *Probabilistic Extension*:

Instead of being sure that the untreated potential outcomes for units 6 and 7 are 0, we think the probabilities of being a ‘1’ for units 6 and 7 are **.3 and .4**, respectively ($k = 2$).

Corrected:

Instead of being sure that the untreated potential outcomes for units 6 and 7 are 0, we think the probabilities of being a ‘1’ for units 6 and 7 are **0.2 and 0.3**, respectively ($k = 2$).

The four scenario probabilities Table 4 prints are the product distribution of 0.2 and 0.3, and the deposited code uses those two values. At 0.3 and 0.4 the four probabilities would read 0.42, 0.18, 0.28 and 0.12 rather than the published 0.56, 0.14, 0.24 and 0.06.

Unit 6	Unit 7	EV Bounds	Probability
0	0	[0, 30]	0.56
1	0	[-10, 20]	0.14
0	1	[-10, 20]	0.24
1	1	[-20, 10]	0.06

Note: Table 4, drawn from the deposited replication archive by `maintained/table_4_probabilistic.R`. No cell is corrected; the table is reprinted because its probability column is what the sentence disagrees with.

9. The end-of-conflict bounds width

Published, Appendix A:

The incorporation of qualitative beliefs about counterfactuals shrinks the width of the extreme value bounds from 100 to **41** points.

Corrected:

The incorporation of qualitative beliefs about counterfactuals shrinks the width of the extreme value bounds from 100.0 to **44.4** points.

The next clause of the same sentence calls the resulting bounds 45 points wide, which is the difference of the rounded endpoints [-3, 42]. Rounding the width itself gives 44 instead, so 44 and 45 are the two whole numbers one exact quantity yields depending on where the rounding is applied, and both are defensible. 41 corresponds to nothing in the analysis. No end-of-conflict quantity is touched by the appendix C corrections, all seven of which are democratization cases.

10. The count of disbanded and discredited democratization cases

Published, *Imputing Missing Potential Outcomes*, Step 1:

The observed outcome $Y_i(0)$ in each of these **four** cases was 0, as authoritarianism did not resume within 10 years of transition.

Corrected:

The observed outcome $Y_i(0)$ in each of these **two** cases was 0, as authoritarianism did not resume within 10 years of transition.

The sentence before it names two cases, Bolivia and the Philippines, and appendix Table B.2 lists two at this step. Appendix Table B.1 lists four end-of-conflict cases at the same step, which is where the count appears to have come from.